Government of Pakistan
National Pilot Project No. 3
Assisted by
United Nations Development Programme
United Nations Project PAX/68/540

THE KARACHI DEVELOPMENT PLAN 1974-1985

FINAL REPORT

With Compliments
From
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Government of Pakistan
National Pilot Project No. 3

Assisted by
United Nations Development Programme
United Nations Project PAK/68/540

THE KARACHI DEVELOPMENT PLAN 1974-1985

FINAL REPORT

August 1974

Prepared by
The Master Plan Department, Karachi Development Authority, with the assistance of the United Nations, as part of the Master Plan Project for the Karachi Metropolitan Region (PAK/68/540).

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IN MEMORIAM

Mr. M. Ahmed Ali
Director
Master Plan Department
Karachi Development Authority

17 June 1925 to 18 December 1973

Mr. M. Ahmed Ali was the Director, Planning of the Master Plan Department until his death in December 1973. He was responsible for the development of the Department from a newly created agency with a small staff to a large agency responsible for the planning of the Karachi Metropolitan Region. Most of the work on the Development Plan was done during his term of office.

The Project team would like to express its appreciation of his many valuable contributions to the Project and its deep regret over his untimely death. A great part of his professional life was devoted to the planning of Karachi and to its betterment. His loss is a loss for both the planning profession and the City.
This report has been prepared as part of the work undertaken in the Master Plan Project for the Karachi Metropolitan Region, (PAK/68/540) under which the United Nations Development Programme (formerly the Special Fund), in response to a request from the Government of Pakistan, has agreed to assist the Government in establishing planning for the Karachi Metropolitan Region. The formal basis of this Project is the Plan of Operation signed 17th March 1970.

The United Nations is the Executing Agency for the Project while the Karachi Development Authority (KDA), acts as the Co-operating Government Agency. The United Nations established a staff group for the Project led by the U.N. Project Manager (later an Officer-in-Charge) and consisting of U.N. individual experts as well as U.N. sub-contractor staff of the firm of PADCO, Inc., Washington, D.C., in association with POLYTECHNA/TERRPLAN, Prague, Czechoslovakia, appointed under U.N. contract 2/71. For the transportation planning aspects of the work, PADCO is utilizing the services of one of its member groups, Alan M. Voorhees (AMV) Limited, London, England. The Karachi Development Authority has established a new, separate, semi-autonomous Master Plan Department (MPD) under a Director, Planning to collaborate with the U.N. staff group. The operation is planned and jointly executed by the United Nations and the Master Plan Department.

The United Nations - Master Plan Department Project team gratefully acknowledges the very valuable contribution made to the findings and recommendations by the numerous public agencies and individuals who participated in both formal and informal discussions of work in progress. Their willingness to devote valuable time to the problems and opportunities confronting Karachi is much appreciated. Such participation in the planning process is essential if plans are to reflect the real needs and aspirations of the city, the region and indeed the nation, for Karachi's problems and its potential affect the country as a whole. The Project team, of course, takes full responsibility for any misinterpretations of views expressed by contributors and apologizes for them in advance. It will appreciate having such shortcomings brought to its attention so that they can be corrected.
The maps show the built-up urban areas of various cities. The exception is Tokyo, for which the city limits are shown. Population data for the year 1968 (1969-1970) is approximate for Karachi and other cities.

URBAN AREA COMPARISONS
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(a) Chairmen

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Mr. Munir Husain, Joint Secretary, Ministry of Presidential Affairs, Government of Pakistan.
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Mr. Shah Jehan S. Karim, Joint Secretary, Ministry of Presidential Affairs, Government of Pakistan.
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Mr. Agha Sadruddin, Deputy Speaker, Provincial Assembly, Sind.
Mr. Jam Sadiq Ali, Minister for Housing, Town Planning and Local Government, Government of Sind.
Mr. Kamal Azfar, Minister for Finance, Government of Sind.
Mr. Badruddin Zahidi, Development Commissioner, Government of Sind.
Mr. A.W. Shaikh, Secretary, Irrigation and Power, Government of Sind.

(b) Secretaries

Dr. Khalid Shibli, Chief, Housing and Physical Planning Section, Planning Commission, Government of Pakistan.
Ch. Salim Ullah, Chief, Housing and Physical Planning Section, Planning Commission, Government of Pakistan.

(c) Other Members

Joint Secretary, Economic Affairs Division, Government of Pakistan.
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Secretary, Housing, Town Planning and Local Government, Government of Sind.
Secretary, Communication and Works Department, Government of Sind.
Commissioner, Karachi District Project Commissioner, Chairman, Karachi Development Authority.
Deputy Commissioner, Lasbela District.
President, Cantonment Board, Karachi.
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Project Commissioner/Commissioner, Karachi District.
Secretary, Local Government, Government of Sind. Representative, Government of Baluchistan.
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(b) Other Members

Administrator, Karachi Municipal Corporation.
Chairman, Karachi Cantonment Board.
Chairman, Karachi Port Trust.
Deputy Director, Military Lands and Cantonments, Ministry of Defence, Government of Pakistan.
Chief, Housing and Planning Section, Planning and Development Department, Government of Sind.
Chief Highway Engineer, Sind Highway Department.
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Pakistan Television Corporation Ltd., Educational Television.

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Sind Industrial Trading Estates, Karachi.
Sind Road Transport Corporation.
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Karachi Electric Supply Corporation, Karachi.

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PREFACE

1. This report has been prepared as part of the work undertaken in the Master Plan Project for the Karachi Metropolitan Region (PAK/68/540, National Pilot Project Number 3 of the Government of Pakistan) under the United Nations Development Programme in response to a request from the Government of Pakistan. The formal basis of this project is the Plan of Operation signed 17 March 1970. The initial United Nations-PADCO Contract under which this Report was prepared extended over a period of three years, beginning 1 February 1971.

2. The United Nations is the Executing Agency for the Project while the Karachi Development Authority (K.D.A.) acts as the Cooperating Government Agency.

3. The purposes of the project are:

(a) To prepare an overall development plan for the Karachi Region and for the Karachi Metropolitan Area — a programme that is to maintained and modified, as necessary, as part of the Government's permanent planning activity.

(b) To establish permanent governmental planning machinery for the guidance of growth in the Metropolitan Area and the Region.

(c) To train the professional staff necessary to sustain such planning.

(d) To identify specific programmes and projects necessary for implementing the overall plan, as a basis for subsequent feasibility studies and project preparation.

A. THE CYCLICAL STRUCTURE OF THE PLANNING PROCESS

4. The work was organized in four major phases. Preparatory activities, extending from September 1968 through January 1971, were concerned with the establishment of the Master
Plan Department by the Government, the preparation of basic technical materials and the execution of a series of studies to provide data for the project.

5. The First Cycle of planning, extending from February 1971 through September 1972, produced two major outputs — recommendations defining two alternative long-term development strategies that appeared to deserve serious consideration by Government and a series of recommendations for immediate action that could be initiated even before overall planning was completed.

6. The two alternative strategies prepared were called the Distributive Investment Plan (DIP) and the Concentrated Investment Plan (CIP). They represented the extremes of a spectrum of viable policy choices that were available to the Government. The DIP strategy was designed to reduce the major inequities among income groups as quickly as possible even, if necessary, at the expense of productivity and aggregate output growth in the short run. The CIP was designed to increase net output as quickly as possible, even if this would necessitate continued inequities in the distribution of the benefits of economic growth in the short run.

7. The DIP strategy was selected by the Government as a guideline for the Second Cycle planning work.

8. The Second Cycle, extending from October 1970 through July 1973, was concerned with the development of more specific policies within the general orientation established by the First Cycle and an examination of alternative physical development possibilities for the Region, with emphasis on the Karachi Metropolitan Area.

9. Two regional alternatives were considered. The one selected concentrates new growth in the Karachi Metropolitan Area. The other proposed to distribute 900,000 people in the Region who otherwise would locate in Karachi. It proposed a major new city at Kalu Khar. This alternative was rejected because the initial capital costs were too high and the risk to government and private firms could not be justified.

10. Two alternatives were considered for the Karachi Metropolitan Area. One proposed a polycentric pattern of development designed to respond to the most obvious growth pressures particularly in the northeast section of Karachi. The other, which was selected, proposes a corridor form of development which makes better use of existing infrastructure investments, permits additions to the metropolitan structure at lower capital costs, and holds out the potential for lower public operating costs and private transportation costs.

11. The Development Plan presented in this Report is an elaboration of the DIP strategy and physical growth patterns selected by the Policy Advisory and Steering Committee for the Region and the Metropolitan Area — concentrated regional settlement with the "corridor" form of metropolitan development.

12. Concurrent with this concern with the overall Development Plan, work on immediate action projects continued throughout the Second Cycle.
13. The Third Cycle, extending from August 1973 through June 1974, with the Contractor's field work terminating in February 1974, had as its principal purposes the finalization of the Development Plan, including recommendations for the legal, administrative and fiscal instruments necessary for its implementation, and recommendations for immediate action.

14. This cyclical structure was designed to force at least preliminary decisions to the surface quickly enough to identify the major issues that should be confronted in more detailed planning, to provide the Policy Advisory and Steering Committee with an opportunity to establish policy guidelines at an early stage in the work and to generate proposals for specific projects that could be implemented even before the full establishment of long-range planning.

15. Too often in the past the initial planning for major metropolitan areas has gone on for five years or more before yielding any useful results. In some cases this has been due to unnecessarily long analysis. In other cases, planning agencies have become inundated with short-range planning of an essentially "fire-fighting" character. In the present project an attempt was made to strike a balance between excessive preoccupation with urgent issues and excessive analysis beyond the limits of the data available.

B. THE STRUCTURE OF THE DEVELOPMENT PLAN

16. The actions recommended in the Plan fall into roughly two groups -- those that are clearly within the present scope of the Karachi Project and those that are primarily the responsibility of agencies other than the agencies concerned directly with the Plan.

17. The policy statements presented include three kinds of proposals: 1) policy recommendations for which the Karachi Project has taken the initiative at the request of other agencies or for which planning is not yet being undertaken by existing agencies; 2) suggestions for sectors that are primarily the responsibility of agencies not yet concerned directly with the Plan; and 3) proposals already made by other agencies where their coordination with other aspects of metropolitan and regional development is judged to be essential.

18. The sector policy statements therefore represent an attempt at a fairly comprehensive account of what is already proposed or should be proposed for the successful development of the Region.

19. What lies within the scope of the Karachi Development Plan and what lies outside it is still not fully determined. The situation is very much in flux. What is regarded as a Karachi Project concern at a particular time is a reflection of governmental judgements as to where responsibility for specific aspects of planning should lie at that time. In some cases it is also a reflection of gaps in existing governmental machinery. At some point in the future, most metropolitan transport planning, for example, might be the responsibility of a specialized Metropolitan Transport Authority, working within the framework established by the comprehensive
metropolitan area planning agency. In the meantime, since there is no agency to do this, the Project is taking responsibility for the first stages of metropolitan transport planning.

20. It will always be difficult to answer unambiguously the question of where specific planning responsibilities lie. It is essential that the question be answered as precisely as possible when the Development Plan is used as a basis for detailed planning. This is obviously necessary for a sensible assignment of responsibilities for detailed planning. It is also crucial for the finalization of financing proposals and the allocation of responsibilities for implementation, since it will affect decisions concerning the specific budgets for individual plan components.

21. At the moment, however, the distinction is less important than the need to consider the key sectors jointly, rather than in isolation. From this, it is hoped, will flow decisions as to how responsibilities should be assigned for translating the policies proposed into the action that is essential to overcome Karachi’s worst deficits and move toward a realization of its full potential.

22. The arrangement of the description of the proposals for sector programmes follows as closely as possible the structure of the Annual Plan. This is done to help link local planning as directly as possible with federal and provincial planning and, in particular, to facilitate the integration of the Karachi Development Plan budget with those of Federal Annual Plans and Provincial Annual Development Programmes.

C. GEOGRAPHIC COVERAGE

23. The overall geographic territory used for statistical purposes in the Project is the Karachi Metropolitan Region, shown in the map The Karachi Region. The area of the Region is 7,595 square miles.

24. According to Project estimates, the total regional population for 1973/1974 is approximately 4,448,000 -- approximately 4,200,000 urban and 248,000 rural (including small service centres and villages).

25. The geographic area which is of primary concern is the Karachi Metropolitan Area, extending from Hab Chauki through Dhaubjei-Gharo, with an estimated 1973/1974 population of approximately 4,182,000 -- 94 per cent of the Region’s total population and 99.6 per cent of its urban population.

26. The built-up area of the Karachi Metropolitan Area, including developed vacant land and restricted/defence lands but excluding non-urban space, is approximately 135 square miles, or 1.8 per cent of the regional area.

27. The regional boundaries were established in the early stages of the Project to provide a basis for the organization of data pertaining to development in the immediate vicinity of Karachi. They do not, of course, provide a sufficient geographic base for analyzing Karachi’s major functional
linkages with other urban centres and rural areas; nor do they define the limits of the territory that must be considered in evaluating the growth potential of the metropolis.

28. Many of the urban centres and agricultural areas and many of the resources (including water) that are likely to affect Karachi's future significantly are outside the Region or originate outside it. Even Hyderabad, the third largest urban centre in Pakistan, with an estimated population of approximately 800,000 and lying only 100 miles to the north-east of Karachi, was outside the original regional boundaries.

29. No single set of regional boundaries can be appropriate for all of the territorial and jurisdictional concerns of effective urban and regional planning. Much more important than the definition of any particular set of boundaries is the achievement of a set of mechanisms by which decisions in Karachi and other related areas can be co-ordinated effectively.
D. POLICY REVIEWS

30. It was considered important to the success of the Development Plan that a policy review process be created. A Policy Advisory and Steering Committee was formed. Its purpose was to establish objectives for the development of the Region, and to review the Development Plan and its components during their preparation. The Policy Advisory and Steering Committee membership included representatives of the Government of Pakistan, the Government of Sind, the Government of Baluchistan, the Commissioner, Karachi District (Project Commissioner), the Deputy Commissioner, Lasbela District, the President of the Cantonment Board, Karachi, the Director-General, Karachi Development Authority (Project Director), the Director, Planning, Master Plan Department, KDA and representatives of the United Nations.

31. An international panel of recognized experts in metropolitan planning was provided by the United Nations to review the output of each cycle of the planning work. Working Groups were also established in each of the areas of major concern including Agriculture, Industry and Commerce, Water Resources, Transportation, Ports and Harbours, Tourism, Housing, Utilities, Health, Education and Land Policy. The membership of these Working Groups included representatives of government, agency administrators and private groups. The Working Groups helped to establish objectives for each sector and to evaluate sectoral plans.

E. THE IMPLEMENTATION OF THE DEVELOPMENT PLAN

32. There undoubtedly will be deviations from the Development Plan during implementation. There are likely to be delays in the mobilization of resources, cost overruns, administrative bottlenecks, the introduction of new programmes and policies and variations in the external economic situation. The Development Plan is not a rigid blueprint. It is, rather, an indicative plan whose purpose is to establish guidelines for agency programming, land development, land regulation, financing, budgeting and the organization of the development of Karachi.

33. The relationship of the Plan with budgeting and project approval is extremely important since it is through the approval of projects and the incorporation of projects into budgets that the Plan is carried out. All development projects proposed for the Region should be reviewed for consistency with the Plan, and should be included in budgets only if they are compatible with the current Plan.

34. Finally, the role of donors and lenders of foreign aid in the implementation of the Plan is very important. It is expected that both financial aid and technical support will be necessary for the implementation of the Plan. To mobilize this aid as effectively as possible and on a timely basis, it is essential that potential donors and lenders be involved in the planning process as early as possible and as fully as possible.
F. THE NEED FOR ONGOING PLANNING

35. The completion of the initial Development Plan should not signal the end of planning for the Karachi Region. Rather, it should be regarded as the beginning of ongoing planning. Parts of the Plan will be revised annually as the situation changes and as new policies are developed. It is hoped that comprehensive revision of the Plan will not be necessary for some time but between planning revision periods a systematic effort must be made to monitor development and collect information needed for both immediate and later Plan updating.

G. TOWN PLANNING AND DEVELOPMENT PLANNING

36. The term “town planning” is derived from early English and subsequent Indian usage, as reflected in the Bombay Town Planning Act, 1951 (later re-titled “Sind Town Planning Act” as applied to the first Province of Sind). The principal “town planning” activities under the English laws and their foreign derivatives are the framing and carrying out by local authorities of schemes for urban improvement, town expansion and road and housing development.

37. In the United Kingdom and other countries which originated similar practices these activities have long been recognized as entirely inadequate for the guidance of urban growth. They are far from sufficient to ensure that paper plans will be translated into actual development or that physical development will be economically and socially sound.

38. At least three major problems are associated with the traditional concept and practice of “town planning” or “master planning”.

(a) It has been focused far too narrowly on physical development -- as if urban growth and renovation were primarily large-scale engineering and architectural problems. This is even less appropriate in a situation like Karachi’s, where the problems are not only physical but, more fundamentally, economic, social and administrative, than it was in the relatively developed countries in which the practices started.

(b) It has been associated with a concept of a “plan” that is far too static. Typically a “Master Plan” has been prepared and then updated every five to ten years. The most recent Master Plan for Karachi was finalized in 1951. Such master plans are often out of date by the time they are published. They do not provide a means by which the many agencies that must contribute to sound metropolitan growth can interact throughout the planning and development process. Master Plans cannot be a substitute for having as a permanent part of the machinery of government a planning process through which data on the condition of the Metropolitan Area are kept current and through which policies, long-range plans and specific action programmes are evolved continually in response to current needs.
(c) Traditional town planning and the preparation of traditional "schemes" fail to recognize the project cycle through which initial development ideas are translated into feasible plans, funded, implemented, operated and monitored. It is a cycle which requires not only the formulation of long-range objectives and plans but also specific project feasibility analysis and design, the mobilization of public and private resources, physical construction and programme implementation, follow-up to check and evaluate actual development relative to expected development and, on the basis of this, an updating and improvement of programmes as planning and development continue.

39. The project cycle requires not only the skills of the long-range planner, urban designer and engineer but also the skills of the negotiator and administrator. The metropolitan planning and development team that must take the initiative in mobilizing public and private action cannot be staffed by planners alone.

40. Because of these difficulties with previous concepts and practices "development planning" will be used, instead of "master planning" to refer to the permanent metropolitan planning process that has been initiated through the present Karachi Project.

41. "Development Plan" rather than "Master Plan" will be used to refer to the overall framework that is to be a guide for metropolitan development at a particular point in time within that process.

42. Detailed area plans (or schemes) will also be differentiated from the overall Development Plan. This is a distinction based on territorial scale and the allocation of agency and staff responsibilities for planning work, rather than a difference in approach between overall planning and planning for individual areas. Both must be intimately concerned with economic, social and administrative development as well as physical development.

H. OTHER DOCUMENTATION

43. In addition to this present Report, two other major Report were produced:

First Cycle Report (presenting existing trends and issues and policy alternatives):

Volume One -- Summary Findings and Proposals
Volume Two -- Trends and Issues
Volume Three -- Alternative Plans

Second Cycle Report (presenting physical and sectoral plan and programme alternatives):

Part I -- Prospects and Problems
Part II -- The Distributive Investment Plan Development Strategy
Part III A -- Alternative Regional Settlement Patterns
Part III B -- Alternatives for the Physical Development of the Karachi Urban Area
Part IV -- Means and Responsibilities
44. During the course of the Project, over one hundred reports dealing with major subject areas and over one thousand reports and memos dealing with smaller components of the work were produced. A list of the most important of these is included in the Annex of this report. A full bibliography is available from the Master Plan Department, SDA. Copies of each report or memo are available for use in the library of the Department in Karachi.
CHAPTER I

THE NATIONAL CONTEXT

A. OVERALL SITUATION

45. Pakistan faces the future with the knowledge that its successful economic and social development must depend heavily upon the development of its human resources. No rich endowment of minerals has yet been discovered. Only about 38 per cent of its land is arable. It will have to continue to depend heavily on imports and achieve high export levels to support those imports.

46. The stresses to which the nation has been and will be subject are considerable. The rate of growth of national population is high -- perhaps as high as 3.3 per cent, up from earlier rates of the order of 2.7 per cent and 2.9 per cent. The crude birth rate is of the order of 45 births per thousand, with a crude death rate of the order of 15 per thousand and infant mortality of the order of 113 deaths per thousand live births. The total population recorded in the Census of 1972 was 64,892,000. It is estimated to be 65,800,000 in 1974.1/

47. Economic growth has fluctuated markedly since the early 1960s. The annual rate of growth of gross domestic product (GDP) slowed down from about 6.7 per cent in the early 1960s to about 6.2 per cent in the late 1960s. In the period 1970-1972 GDP grew by only 3.3 per cent, while population increased by about 5.8 per cent, so that per capita income declined. There are severe regional inequalities in output levels, as the figures below suggest.

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1/ Government of Pakistan, National Pilot Project Number 3, Master Plan for Karachi Metropolitan Region. Project estimate.
Table 1.1
Estimates of Pakistan gross domestic product, at current factor cost of 1968/1969 by provinces (PRs. crores)

|                        | Pakistan | Baluchistan | Sindh including Karachi | Punjab | NWFP
|------------------------|----------|-------------|------------------------|--------|------
| Gross domestic product | 3564.4   | 76.9        | 980.5                  | 2135.6 | 371.4 |
| Population (in lakhs)  | 582.7    | 16.9        | 114.8                  | 347.9  | 103.1 |
| Per capita gross product | 612.0    | 455.0       | 854.0                  | 614.0  | 360.0 |

a/ Northwest Frontier Province


48. Gross investment, as a percentage of GDP, declined from about 22.5 per cent in 1964/1965 to about 10.9 per cent in 1971/1972; domestic savings declined from about 13.5 per cent of GDP in 1964/1965 to about 8.4 per cent in 1971/1972. The country has been heavily dependent on foreign aid. Of the net development programme of PRs.4.5 crores for 1972/1973, PRs.301 crores were to be financed from external resources (project aid, commodity aid and food aid, including PL-480). The debt-service to exchange earnings ratio is of the order of 21 per cent in 1972/1973 and may well increase by 1975/1976. The balance of payments deficit was of the order of 129.5 million dollars in 1972/1973 and is likely to increase substantially in the immediate future, though it may decrease again in the second half of the 1970s. There are extreme inequities, nationwide, in household incomes. Basic consumption standards are low, even by Asian standards, in both the urban areas and the rural areas. In 1961 it was estimated that only 17 per cent of the adult population was literate. The high infant mortality rate noted earlier is indicative of the severe health problems that confront the nation. Labour productivity is persistently low for large segments of the population.

B. URBANIZATION

49. The urban population is estimated at 16.8 million and growing at a rate of 4.8 per cent, or about 810,000 persons per annum.

50. The most fully urbanized areas are the Punjab, lower Sind and Potwar Plateau, while the Upper Sind and most areas of Baluchistan and the Northwest Frontier are little urbanized.

51. In all the larger urban areas in particular there is a crisis caused by the lack of services. Much housing is on unauthorized land; water supply, sewerage, drainage and solid waste disposal are very poor; education, health and employment services are inadequate; and there are major deficiencies in urban public transport. Funds available for urban development are extremely limited and there have not yet been developed suitable institutions for guiding and co-ordinating local development.

52. The distribution of major urban centres, based on pre-1972 Census estimates, is shown in the diagram Pakistan Major Urban Centres 1971. The 1972 Census confirms that Karachi is dominant with a population of 3,469,000 — about 1.6 times the population of Lahore (2,148,000), the next largest centre. Karachi and Lahore are followed by Lyallpur (820,000), Hyderabad (624,000), Rawalpindi (615,000) and Multan (544,000). Next in order of size in 1972 come Gujranwala (366,000), Peshawar (273,000), Sialkot (212,000) and Sargodha (203,000). The other 10 centres identified in the group of 20 largest cities and metropolitan areas in the 1972 Census provisional estimates have populations ranging from 77,000 (Islamabad) to 159,000 (Sukkur).

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3/ "Urban Area" is defined in the Census to include:

"... places having a Municipal Corporation, Municipal Committee, Cantonment Board or Town Committee. In general, an urban area will be a concentration of population of at least 5,000 persons in a continuous collection of houses where the community sense is well developed and the community maintains public utilities such as roads, street lighting, water supply, sanitary arrangements, etc. These places are generally centres of trade and commerce with a population substantially non-agricultural and having non-agricultural labour concentration and a high literacy rate. As a special case, a few areas which have urban characteristics, but have less than 5,000 population may also be treated as urban areas. The list of areas to be treated as urban is provided as required by the Provincial Directors of Census to the Census District Officers."


4/ This figure for Hyderabad seems low relative to a recent estimate of about 800,000.
53. The rate of growth of the nation's urban population is much higher than the rate of growth of the total population — perhaps as high as 4.8 per cent. Even though the census classifies centres with as few as 5,000 inhabitants (sometimes even less) as "urban", the implications of this growth rate for the level of public action that must be achieved if the urban population is to be supported adequately are immense. Within 26 years the urban population of the nation may be in the vicinity of 60 million, almost as large as the entire population at present. Even if the 20 cities with more than 75,000 population in 1972, including Karachi, were to grow at 4.5 per cent through the turn of the century, they would together account for an urban population of only 36 million, leaving 24 million to be accommodated in existing smaller cities or in entirely new urban concentrations. Even by 1985, something of the order of 15 million urban inhabitants would have to be accommodated outside these 20 largest cities.

54. The massive urbanization that is foreseeable, by no means unique to Pakistan, is a trend that is not likely to be reversed. The forces accelerating urbanization are basic ones. As agricultural productivity increases the employment generated by a particular level of demand for agricultural output decreases, and pressures for migration from rural to urban areas increase. As population and incomes grow, the markets for urban output expand. Income elasticities of demand for urban output are typically higher than those for agricultural output. Urban areas are characterized by indivisibilities in production and consumption which enhance their attractiveness.
53. Urban areas constitute concentrated markets for both agricultural and non-agricultural output. They contain large labour pools and have available, as required, many intermediate products and business services that make it easy for a firm to survive and grow while minimizing its own fixed capital commitments and keeping its operating reserves small. They are centres of capital accumulation as well as centres of technical change. They facilitate the face-to-face contact that is such an essential part of many business transactions. Because they provide multiple opportunities for both the employee and the employer, urban areas are excellent risk spreading devices. Their advantages are social as well as economic. They free the villager and the farmer from many of the social constraints of a traditional smaller settlement. They contain a multitude of opportunities for informal education. Urban areas attract the in-migrant, not only because of real or imagined economic opportunities but also because they offer the opportunity to be where things are happening.

54. The city's effectiveness as an economic mechanism facilitates an efficient use of scarce capital and management. The specialization associated with urbanization and economic growth helps to bring marginal labour into productive activity. "Low productivity" employment in services in major centres often is regarded as bad as a result of mistaken interpretation. For the pan wallah and the unskilled rural migrant finding work in urban construction, the opportunities for higher incomes, education and richness of experience are far greater in cities than in rural areas and small semi-rural settlements. The move to the city is in part a push from desperate conditions elsewhere, but largely a pull toward genuinely greater opportunities. Moreover, it is not just the pan wallah or the recently arrived construction worker who is better off in the big city. For the nation as a whole it probably represents the most effective possible use of their labour. The city's relatively high efficiency and low risk makes it also an important earner of foreign exchange. Many foreign entrepreneurs require an urban context to support their capital investments.

55. Because urbanization concentrates population in relatively productive centres and because some regions have higher potential for urbanization than others, the process of urban growth is likely to be accompanied by marked regional and urban-rural "imbalances". These imbalances should not be assumed to be bad at this stage of development. They are likely to be associated with substantial increases in total output. Moreover, it is likely that they will be redressed gradually, through inter-regional adjustments in population and investment. The migrant population is better off economically than it would otherwise be and the city typically generates resources that are transferred, at least in part, back to rural areas and smaller settlements -- in the form of remittances made by migrant workers who leave their families in the settlement from which they have come, in the form of capital accumulated in the city and invested by private entrepreneurs in other areas and in the form of the massive public revenues that typically are drawn from major urban centres for use elsewhere.
58. Differences in urban and rural incomes are likely to be reduced also by increases in agricultural productivity and by successful urban growth, for urban and agricultural development are interdependent. Growing urban areas provide increasing markets for agricultural output; agricultural areas provide a large part of the market for urban output; urban manufacturing provides many of the fertilizers, implements and other inputs required for increasing agricultural productivity; urban centres, in turn, depend upon agricultural areas for their foodstuffs. Urban and semi-urban centres are essential parts of agriculture's marketing system. Major urban centres are breeding grounds for some of the kinds of technological change necessary to increase agricultural productivity, and agricultural exports provide part of the foreign exchange necessary to finance urbanization.

59. To appreciate the advantages of urbanization is not, of course, to deny its problems. The congestion, squalor and human suffering that accompany rapid urbanization are prime concerns of the entire Karachi planning effort. Large-scale urban growth typically brings together massive concentrations of population at a time when the urban management skills needed to provide a decent base for city life are desperately lacking. It is also typically a time at which there is little public interest in investment in social overhead. Moreover, the rate of urban growth usually is so high that a large part of public infrastructure investment is needed to cope with new growth, leaving very little public capacity for renovation. There is only limited private capacity for such investment since a majority of the City's population are desperately poor and are preoccupied with survival.

60. On balance, however, the advantages of urbanization far outweigh its disadvantages. Indeed, greatly diminished urban growth in Pakistan in the next three decades probably would signal overall economic and social disaster. The task ahead is not to try to reverse the urban trend but to mobilize more effectively the resources it generates so that the quality of urban life can be upgraded.

C. NATIONAL PROJECTIONS

61. Although recent economic data suggest a healthy recovery from 1970-1972, it must be kept in mind that the economy has undergone tremendous structural change since the severance of the East Wing, and that its new structure is still in the very earliest stage of development. It is still difficult to evaluate the significance of Pakistan's new trade relationships relative to the loss of East Pakistan as both a market and a source of export earnings. The extent to which foreign aid and investment will be forthcoming also remains uncertain. The evolving participation of government in industry is also an important factor that may contribute to structural change.

62. The forecasts of population growth were based primarily on Census data and on population projections prepared by the Pakistan Institute of Development Economics (P.I.D.E.). On the basis of these projections and their underlying assumptions, the ranges of 86 to 96 million by the year 1985 and 120 to 150 million by the year 2000 appear to be fairly plausible magnitudes. Thus, within these ranges, the (conservative)
mid-points of 78.6 million for 1980, 90 million for 1985 and 100 million for 2000 have been selected to serve as the Master Plan estimates of future national population. These population estimates imply a decline in the average annual growth rate of national population over time.

63. The urban population of Pakistan is expected to continue to grow quite rapidly. The fact that its actual pace will largely be governed by the growth in non-agricultural activities is reflected in the alternative forecasts, which indicate that the highest and lowest percentage shares of urban to total population are associated with the high and low rates of growth in GDP. A reasonable range for the share of urban population by the year 2000 is 42-50 per cent of the total population. This was estimated on the basis of several existing forecasts, as well as by an evaluation of past trends contained in the Census reports from 1901 through 1961 by decennial periods.

64. The 1985 urban population of Pakistan is expected to be 33.2 million, or roughly double the 1970/1971 urban population. Part of the expected urban development will occur in Karachi, Lahore, Rawalpindi/Islamabad and other national urban centres, but, as noted earlier, there remains a tremendous potential for the development of medium-sized and smaller urban centres necessary to accelerate growth and distribute services more evenly. The past and future population growth of Pakistan is illustrated in the figure Population Growth 1911-2000 which shows also the quantitative significance of the Karachi Region in that growth.

65. Because of the degree of uncertainty associated with national economic development, three separate projections were made. They are presented in Table I.2, National Projections.

66. The forecast estimates of gross domestic product are based on data presented in the Annual Plan, 1972/1973 and data contained in the official economic statistical sources. The three alternative projections reflect low (4 per cent), medium (5.5 per cent) and high (7 per cent) growth assumptions about the future prospects for the national economy through 1985. The different assumptions are associated with different levels of urbanization, different levels of domestic savings and different levels of net foreign resource inflow.

67. By 1985 the GDP should be PRs.8,727 crores. Because of the relatively high expected rate of population growth, even the medium growth rate assumed for GDP is sufficient only to raise per capita product from PRs.724 in 1974 to PRs.970 by 1980.

68. The projections of gross investment (including changes in stocks) are very approximate, inasmuch as they have been derived from the GDF projections by use of a capital/output ratio of 3.0 with a one-year time lag. Gross investment, together with the projections for gross domestic saving, has been used for forecasting foreign assistance requirements in estimating Master Plan development resources.
KARACHI REGION URBAN POPULATION

PAKISTAN URBAN POPULATION

PAKISTAN TOTAL POPULATION

POPULATION GROWTH • 1911-2000
PAKISTAN TOTAL, PAKISTAN URBAN,
AND KARACHI REGION URBAN
<table>
<thead>
<tr>
<th>Uncontrolled situation variables</th>
<th>1970 est.</th>
<th>1974 est.</th>
<th>Low output</th>
<th>Medium output</th>
<th>High output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pakistan: Total population (in millions)</td>
<td>60.0</td>
<td>66.8</td>
<td>78.6</td>
<td>90.0</td>
<td>130.0</td>
</tr>
<tr>
<td>2. Pakistan: Urban population (in millions)</td>
<td>16.8</td>
<td>20.3</td>
<td>25.9</td>
<td>31.7</td>
<td>54.6</td>
</tr>
<tr>
<td>4. Pakistan: Gross domestic product per capita (rupees)</td>
<td>690</td>
<td>725</td>
<td>780</td>
<td>828</td>
<td></td>
</tr>
<tr>
<td>5. Pakistan gross investment</td>
<td>7 400</td>
<td>7 990</td>
<td>7 353</td>
<td>8 946</td>
<td></td>
</tr>
<tr>
<td>6. Pakistan: Gross domestic savings</td>
<td>5 588</td>
<td>4 843</td>
<td>6 238</td>
<td>7 813</td>
<td></td>
</tr>
<tr>
<td>7. Pakistan: Foreign assistance</td>
<td>1 812</td>
<td>3 147</td>
<td>1 115</td>
<td>1 133</td>
<td></td>
</tr>
<tr>
<td>8. Average annual growth rate population (%)</td>
<td>-</td>
<td>2.74</td>
<td>2.74</td>
<td>2.74</td>
<td>2.48</td>
</tr>
<tr>
<td>9. Share of urban to total population (%)</td>
<td>28.0</td>
<td>30.3</td>
<td>32.9</td>
<td>35.2</td>
<td>42.0</td>
</tr>
<tr>
<td>10. Average annual growth rate of urban population (%)</td>
<td>-</td>
<td>4.8</td>
<td>4.1</td>
<td>4.1</td>
<td>3.7</td>
</tr>
<tr>
<td>11. Average annual growth rate of GDP (%)</td>
<td>-</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>-</td>
</tr>
<tr>
<td>12. Average annual growth rate of GDP per capita (%)</td>
<td>-</td>
<td>1.2</td>
<td>1.2</td>
<td>1.2</td>
<td>-</td>
</tr>
<tr>
<td>13. Marginal savings rate from GDP per capita (%)</td>
<td>-</td>
<td>-</td>
<td>12.0</td>
<td>15.0</td>
<td>-</td>
</tr>
<tr>
<td>14. Share of savings from GDP (%)</td>
<td>13.5</td>
<td>10.0</td>
<td>10.2</td>
<td>10.5</td>
<td>-</td>
</tr>
</tbody>
</table>
69. The gross domestic savings projections were calculated on the basis of percentage shares of savings in GDP which, over the forecast periods, were derived from the average annual growth rate of GDP per capita and the marginal savings rate for per capita product. For the low output alternative, the marginal savings rate for 1984/1985 was estimated to be 15 per cent, which is slightly higher than the estimate for 1973/1974; for the high output alternative, it was estimated to be 28 per cent (based on the 1970-1985 Perspective Plan); and for the medium output alternative, the estimate is 22 per cent, which is the mid-point estimate.

70. The projections of foreign assistance to Pakistan were calculated as the difference, or the "gap", between the gross investment and the gross domestic savings estimates. It will be noted that, while the requirements for foreign resources become fairly high in the future, the existing (1972/1973) levels correspond quite closely to the estimates for the medium output alternative. It should be cautioned, however, that it would be possible to achieve the projected rates of GDP with lower foreign assistance requirements if either 1) higher efficiency of investment with lower capital/output ratios were to occur, or 2) if higher levels of gross savings, at the expense of reduced consumption, were forthcoming.

D. THE NEED FOR NATIONAL SPATIAL POLICY

71. It is clear that rural and urban development planning at the national scale must go hand in hand. It is clear also that planning for the creation of entirely new urban centres and the growth of small- or medium-sized towns must be undertaken in addition to planning continued support for existing large centres. This suggests that national, provincial and local planning must be linked somewhat more closely than in the past and, in particular, that there must be much more explicit concern with the specific locations in which public investments and other public activity are to take place.

72. There is not so much a need for a separate "urban" planning effort at the national level as there is a need for a more explicit concern with the spatial distribution of all types of public investment and public activity. In assembling the provincial and national plans, local capacities for implementation must be recognized more fully. So must the productivity and equity implications of alternative spatial patterns for investment -- including a recognition of complementarities and indivisibilities that are likely to result from capital investment and other public actions taking place in different sectors in the same location.

73. Location-specific analysis should be introduced into the macro-economic frameworks of annual plans and five-year plans. It is fairly obvious that alternative spatial distributions of investment are likely to have different consequences for GDP. To take but one example, highly dispersed investment which opens up new areas is likely to require higher fixed investment for the same GDP, relative to a concentration of investment in existing areas; it may also have
substantially different short-run equity consequences. It is likely also that differences in the spatial distribution of investment will lead to differences in aggregate consumption and the composition of consumption because of differences in consumption patterns in different parts of the country -- including, obviously, differences between urban and rural or semi-rural areas.

74. Without such location-specific analysis neither the implementability of plans nor their productivity and equity implications can be assessed properly.

75. Information on existing conditions and trends in individual regions and centres, inter-area data, and data on the financing requirements, operating characteristics and locational preferences of the various types of agricultural, manufacturing, service and other activities to be considered in preparing development programmes, updated regularly, should be used to identify the need for projects, to select locations for projects that are desirable from a macro-development point of view, and to evaluate the likely impact of projects or groups of projects on specific areas. Analysis of this kind should be incorporated in national and provincial planning as quickly as possible. Sensitive locational decisions are essential for the rectification of the nation’s worst deficits. They are also essential to take proper advantage of local potential. Such analysis must be undertaken if macro-economic and social plans at the national and provincial levels are to be realistic. It must be undertaken if the opportunities available in medium-sized and smaller centres are not to be overlooked in favour of an emphasis on agricultural development and the nation’s major centres. It is necessary to the systematic identification of the relative merits and demerits of individual agricultural areas, existing urban centres, locations with high urban potential, and locations with a high potential for special purposes such as tourism.

76. Fortunately, a large part of the mechanism necessary for such integrated planning is already in place at both the national and provincial levels. The National Economic Council stipulates that for major public investment decisions each proposed public sector development scheme must be scrutinized and subject to the approval of a Provincial Development Working Party. It must also be subject to review by a Central Development Working Party if it is expected to cost Rs. 50 lakhs or more non-recurring or Rs. 20 lakhs or more recurring.

77. What is needed now is a more explicit recognition of the implications of the locations of investments and the establishment of explicit locational priorities in a process in which “top down” macro-economic and “bottom up” planning (aggregating national plans from well-defined local plans) are fully fused.

E. THE ROLE OF KARACHI

78. The potential and the problems of Pakistan’s urbanization are highlighted in Karachi. It is pre-eminent in the advantages it offers and in its capacity to accelerate economic and social development nationally, as well as locally. It is an engine of development for the entire country.
79. National and provincial growth and the development of Karachi are inextricably intertwined. National and provincial resource allocation decisions obviously determine in part the nature of the development that can occur in the Metropolitan Area. They also affect national and provincial migration patterns and Karachi's size. Perhaps less obviously, decisions on investment and operating cost expenditures in Karachi -- be they Federal, Provincial or local -- affect Karachi's productivity and output and the contribution it can make to national and provincial growth.

80. Karachi's productive capacity must be utilized aggressively to benefit Sind and the nation as well as the population of Karachi itself. Finding solutions to its problems is similarly important not only to the City but also to the nation. Karachi's problems today are the problems of Lahore, Lyallpur, Hyderabad, Rawalpindi and other centres tomorrow. Karachi is an important testing ground for the development of the strategies and programmes needed to guide overall urban growth.

81. Karachi's dominance is evident from the following figures, represented graphically in the diagram Karachi's Role in the Nation. The Metropolitan Area supports 6 per cent of Pakistan's total population and 22 per cent of its urban population; it contributes approximately 15 per cent of gross domestic product; it generates approximately 42 per cent of value added and 35 per cent of employment in large-scale manufacturing. It accounts for approximately 50 per cent of bank deposits and 72 per cent of capital issued. It generates, according to one estimate, approximately 25 per cent of all Federal revenues. In addition to its general urban advantages it is the nation's only major port, and its transport role is to be strengthened by the development of the new facilities already committed for Bundar Qasim.

82. The City is obviously of major importance provincially also. In 1961 the Karachi District contained 24 per cent of the total population of Sind and 66.9 per cent of estimated gross provincial product. It undoubtedly contributes a large and important share of provincial output in trade and service activities. It supports provincial development in agriculture, not only as a consumer of agricultural output and as a shipping centre but also as a supplier of agricultural materials, services and equipment. It is the centre of government for the Province and it has been estimated that it produces 44 per cent of provincial revenues.5/

83. The relatively high productivity of investment in Karachi from the point of view of the firm is suggested by the following figures, based on data from the Census of Manufacturing Establishments for 1967/1968, which are at least crude indicators of the "profitability" of individual locations.

KARACHI'S ROLE IN THE NATION
Pakistan
Selected Provinces
Punjab 0.46
Sind 0.63

Selected Districts
Karachi 0.67
Lahore 0.68
Hyderabad 0.62
Gujranwala 0.63
Lyallpur 0.40
Multan 0.40

84. These figures are for large-scale manufacturing. Each is a "coefficient of profitability" which is the ratio of gross value added (excluding indirect taxes) minus employment costs to the value of fixed assets.

85. Although its dominance will eventually decrease as other urban centres grow, diversify and increase their vitality, Karachi's great advantages mean that it too will continue to grow, though probably at a gradually decreasing rate. As later projections will show, it may reach an urban population of 11 to 15 million by the turn of the century. It is likely to become even larger after that. Although the prospect of such growth in a single centre is regarded with concern by some, any attempt to slow down its growth drastically would be economically and socially foolish. A recent international study which examined urban size and economic efficiency suggests that available empirical evidence indicates that, from an economic point of view, even the largest metropolitan area in the world today is likely to be less than the "optimal" size. 6/ Karachi has a long way to go before its relative economic advantages are exhausted. Moreover, it should be borne in mind that the effectiveness of restricted public investment as a device for slowing down metropolitan growth is fairly limited. Even if it is assumed, for the purposes of illustration, that metropolitan population growth is related directly to investment and that 50 per cent of all investment in the Metropolitan Area is public investment (though it probably is considerably less than this), then a 50 per cent cut in public investment might result in a decrease in the growth rate for 1974-1985 from 4.7 per cent to 3.5 per cent. The population by 1985 would then be 6.1 million instead of 6.9 million, a reduction of only 800,000. The social, as well as economic, consequences of such a cutback in public investment would be disastrous. There are enormous deficits in public services to be rectified in addition to the new growth that must be provided for. The need is for increased, not decreased, public expenditure in the Metropolitan Area.

86. Karachi's pre-eminence in the advantages it offers is, unfortunately, associated with its pre-eminence as a centre for the nation's urban ills. Karachi is indeed a metropolis in a state of crisis. That crisis must be dealt with swiftly if full advantage is to be taken of the potential of the metropolis for contributing to national and provincial as well as local growth. The dimensions of this crisis are examined in Chapter II and Chapter III identifies some of the steps that must be taken immediately to rectify what is becoming an increasingly dangerous situation.

CHAPTER II

THE METROPOLITAN CRISIS -- CHALLENGE AND OPPORTUNITY

A. PAST ACHIEVEMENT

87. A city is the diary of a drama. The drama of the social interaction that is its reason for being; the drama of interaction between man and his environment. Minarets, modern concrete towers and mud-walled hutsmens record its hopes and aspirations, its triumphs and its tragedies.

88. One hundred and thirty years ago Karachi was a walled township of 14,000 on a site of 35 acres. As recently as 1941 the population of Karachi District was less than half a million. A metropolis burst into being with the birth of the new nation. Its achievements are remarkable.

89. Between 1947 and 1951 approximately 600,000 displaced persons who migrated into Karachi from India as a result of the creation of Pakistan in 1947 found shelter in the city, swelling the population to 1,130,000. By 1961 it had almost doubled again to reach 2,140,000. Within seven years, 44,000 families, or about 265,000 people, were provided with housing and basic infrastructure in two new towns. The first of these, Korangi, provided accommodation for 26,000 families in the period 1959 to 1963; the second, North Karachi, provided accommodations for 18,000 families in the three years following that. In other areas, elegant modern bungalows now signal industrial success. Modern manufacturing centres have been established in the Sind Industrial Trading Estate and other areas, and a modern industrial complex has developed, primarily since the 1950's. Commercial skyscrapers have begun to supersede the colonial skyline. There is a flourishing port. Wide avenues reflect the generous dimensions of early planning. Mile after mile of modern canals and pipelines for water and sewage have been installed in the last two decades. The Metropolitan Area is a major contributor to national output. It is a centre for the accumulation of capital. It is a centre of the indigenous technological change that is essential to economic and social growth. It is a focus for foreign investment and technological transfer.
90. It gives sustenance and fresh hope each year to thousands of in-migrants moving into the city from the rest of Pakistan -- not only enabling them to make themselves better off than they could be elsewhere but also enabling them to transfer income back to the families they have left in the smaller towns and rural areas from which they have come.

91. From a national point of view, even though most of the immigrants begin in "marginal" occupations -- as domestic servants, hawkers, peons or unskilled labourers -- the metropolis probably is enabling them to be more productive and contribute more to total output than they could elsewhere.

92. For the 14 years prior to the launching of Islamabad in the north, Karachi was the nation's capital.

B. THE DIMENSIONS OF THE CRISIS

93. Karachi in 1974 is on the threshold of becoming one of the great metropolises of Asia, with a population of 11 to 15 million within the next 30 years. It is at the threshold of modernization, a period that will witness massive urbanization, not only in Pakistan but in all of the developing world.

94. It is on the threshold, optimistically, of a period of rapid economic recovery which will make heavy demands on the City's infrastructure and administration. Perhaps most importantly, it is at the threshold of a period of governmental decision-making that will determine whether Karachi can rise to meet the challenge that confronts it.

95. If it meets the challenge successfully, it can become a vital modern metropolis, attracting investment from all parts of the world, not only prospering internally but also acting as an engine of development for the entire nation.

96. If it does not, if its natural advantages as a port and a city are neglected, if Government does not act quickly enough to prepare it for much greater sustained growth than it has ever experienced before, if present policies which allow it to sprawl extravagantly are not changed and if action is not taken to remedy its tremendous inequities, it will still grow but it will enter a period of crisis and deterioration that is terrible to contemplate.

97. The dimensions of that impending crisis are perhaps best portrayed by a simple listing of metropolitan deficiencies.

1. Population growth

98. Approximately 200,000 people are added to the metropolitan population every year, or 35,000 households. Perhaps as many as 90,000 of the additional inhabitants are unskilled, largely illiterate, in-migrants. By 1985 approximately 6.9 million will live in Karachi and possibly 11-15 million by the turn of the century.
2. Economic conditions

99. There is presently somewhere between 15 per cent and 30 per cent unemployment and underemployment.

100. There is a per capita metropolitan product of only Rs.1,700 (approximately $173) per year.

101. Approximately 45 per cent of urban households have incomes of less than Rs.300 (roughly $31) per month and approximately 80 per cent have monthly incomes of less than Rs.500.

3. Nutrition

102. A majority of the Metropolitan Area's households are unable to afford adequate food consumption (2,050 calories per person per day), yet approximately 472,000 acres of good agricultural soils in the Karachi Region lie unutilized for want of water, agricultural support services and skilled farm management, and vast quantities of food-stuffs are wasted annually in transit from farmlands outside the Region.

4. Water supply

103. There is a total bulk water supply of approximately 140 million gallons per day but only 130-140 million gallons reach the consumer, the rest being lost through leakage and wastage.

104. Though the water is treated adequately in bulk, that which reaches the consumer is badly polluted.

105. Average water availability to households is only 24-29 gallons per capita per day, with ample supplies for the affluent (100 gallons per capita per day or more) at one to two rupees per thousand gallons, but only a trickle, intermittently (as little as 10 gallons per capita per day) reaches the poor, who may be forced to pay twenty to thirty rupees per thousand gallons to have water carried to their huts (only 30 per cent of the Metropolitan Area's households have an individual house connexion).

106. Water mains are underutilized because of lack of inner development in residential areas or premature installation of mains in areas not yet ripe for development.

107. The metropolis is dependent upon the Indus River for almost 90 per cent of its water. This source of supply is subject to intensive competitive claims for water for agriculture and other urban areas. The feeder canal and conduit that bring in the supply is extremely vulnerable to physical disruption.

5. Sanitation

108. Installed sewage treatment capacity is only 40 million gallons per day relative to the water intake of 100-120 million gallons per day. Only half of that capacity
is operative, for want of proper management, and the entire sewerage system is capable of handling only 4 per cent of the biological oxygen demand generated daily.

109. Only about 20 per cent of the Metropolitan Area's households have individual sewer connexions.

110. Sewer pipes have been installed in outlying areas far in advance of the need for settlement.

111. Several hundred thousand of the Metropolitan Area's inhabitants are settled in areas subject to flooding in heavy monsoon rains, flooding that costs many lives, brings sewage into huts, carrying with it the threat of disease, and resulting in considerable property damage.

112. Fifteen hundred to 2 thousand tons of refuse are generated daily, but less than 50 per cent of this is collected and disposed of.

6. Health

113. There are only 1.5 hospital beds per 1,000 population.

114. There exist now only 1.1 health centres per 100,000 population.

115. Presently, there is a geographic distribution of health facilities that leaves the poor the worst served.

7. Education

116. Thirty-eight per cent of the Metropolitan Area's population 10 years of age or older is illiterate, with the illiteracy rate for females much higher than that for males.

117. There are primary school places for only about 70 per cent of the primary-school-age population and secondary school places for only about 32 per cent of the age group.

118. The education programme is not well-matched to the skills needed to accelerate economic growth.

119. As with health, there exists a geographic distribution of facilities that leaves low-income households with the most severe deficits.

8. Housing

120. There are perhaps as many as 800,000 persons living in jhuggies.

121. Only 16 per cent of the dwelling units have water supply, sewerage, and electricity in the house.

122. Only 50 per cent of the Metropolitan Area's households have electricity in their homes and only about nine per cent have gas, although the availability of gas could reduce fuel costs for low-income households by 30-50 per cent.
123. There were 4.7 persons per habitable room in low-income groups in 1970 and 2.8 persons per habitable room in high-income groups.

9. Transport

124. Work commuting time for low-income groups is not only long, up to one hour each way, but costly, absorbing 10 per cent of monthly incomes for thousands of workers in northern and eastern Karachi.

125. Approximately 90 per cent of the arterial road system is underutilized and approximately 57 per cent of it is utilized up to only 50 per cent or less of its capacity; yet major roads still are being constructed far in excess of need.

126. There are only 1,400 buses for a population of approximately 4.2 million, with only 950 buses operative on an average day; with buses designed for 50 passengers carrying as many as 120.

127. Private vehicles providing for 44 per cent of road passenger miles use 83 per cent of passenger road space, while buses providing for 55 per cent of road passenger miles use only 17 per cent of road passenger space.

10. Land use

128. Urban land is used extravagantly at low densities, with high-density low-standard development for the poor juxtaposed with low-density high-standard development for the rich.

129. Over 12,000 acres of land, sufficient to accommodate 1,200,000 people at the current residiatory density of 100 persons per acre, lie unutilized in the heart of the city and in other parts of the built-up area; with public utilities and roads still being extended expensively into outlying areas in response to pressures that are primarily speculative.

130. Twenty-nine thousand acres of land in the built-up area (approximately 27 per cent of the built-up acreage in the Metropolitan Area) have been pre-empted for defence purposes or are under Cantonment Board control and are utilized at very low densities, blocking urban growth, necessitating expensive extensions of the urban area and, in the case of active defence establishments, constituting severe hazards for the nearby civilian population.

131. Major employment centres are highly concentrated geographically, with large low-income populations remote from places of work.

132. The metropolitan structure still has a single downtown core, making that core very susceptible to conges-tion and physical breakdown as the population grows.
133. Much of the physical planning and construction has been hasty and unrelated to local climate, the local economy or local cultural characteristics; planned commercial areas built at public expense lie unutilized, while wide unprotected spaces intended for recreation remain as dust bowls.

11. Finance

134. Only PRs.80 per capita annual development expenditure were made in the Metropolitan Area in 1972/1973 from all public sources (Federal, Provincial and Local).

135. Only PRs.50 per capita annual development expenditure were made for essential urban infrastructure (with 40 per cent of this from local bodies).

136. Local bodies are heavily dependent on an archaic tax (the octroi) that is highly inequitable, easy to evade and expensive to collect.

137. Vast capital gains generated by urbanization, by public expenditures on infrastructure, and by the disposal of public lands at prices far below market values are going almost entirely into private pockets, untapped by Government at a time when there is a desperate shortage of public funds for the financing of urban services and urban growth; the multiplying benefits of urbanization are private while the multiplying costs of public services and facilities and the costs of congestion and squalor are being borne by public agencies and the poor.

12. Urban management

138. There is no permanent agency responsible for Metropolitan planning.

139. There is no mechanism for the effective co-ordination of public investment in the Metropolitan Area.

140. There is no Federal or Provincial Urban Planning Law.

141. Possible as much as 80 per cent of the land in the Metropolitan Area is publicly owned but not being used effectively to guide urban growth -- one of the few great potential urban land banks in the major metropolitan areas of the world is being squandered through loose allotments to private groups and individuals for largely speculative purposes.

142. There is no uniform and effective control of the private use of land.

143. There is insufficient opportunity for public participation in planning.

144. Present management deficiencies in key urban services are so serious that they threaten the very survival of the City.
13. Vulnerability

145. Dependence on a single major source for water, highly concentrated large-scale manufacturing facilities, accumulated deficits in environmental sanitation, an overloaded public transport system and high unemployment all make the Metropolitan Area extremely susceptible to physical and social breakdown.

C. THE OPPORTUNITIES

146. Karachi can respond to the challenge of rapid urbanisation, building on the achievements but rejecting the destructive practices of the past. The opportunities are there. The metropolis lies at the edge of a hinterland that makes it possible to create an efficient agro-urban complex, using urban wastes to support the production of much of the food supply needed by the urban population.

147. The port location provides as yet untapped opportunities for intermediate processing for re-export as well as the opportunity to support growth in the export-import functions that are already well established. The Metropolitan Area harbours the greatest single concentration of modern productive capacity and business skill in the nation.

148. The public ownership of most of the land in the urban area provides a chance to guide growth in a way that is no longer possible in most of the world’s other great metropolises. The open spaces in the heart of the City offer a double opportunity to intensify development, thereby curtailing the extravagant sprawl and to preserve “lungs” of open space in the centre as densities increase.

149. The generous roads and already-installed sections of the water and sewerage systems that are underutilized provide an opportunity now to settle the next wave of population at low capital cost. The areas in which they lie are at last becoming ripe for development.

150. The existing roads, coupled with low car ownership, provide Karachi with an opportunity to avoid the vicious circle of increasing automobile use, heavy investment in roads, more automobile congestion and even more massive public road investment that has characterized major cities in the already industrialized nations of the world. Provided that public transport can be provided at acceptably high standards there is a chance to move immediately to a predominantly mass transport system, bypassing the extravagant automobile age that has plagued North America and Europe.

151. Karachi has the urbanity that arises from a dense intermingling of activities -- residential spaces over shops, sidewalk workshops, restaurants and tea shops jostling modern banks, bakery and masjid juxtaposed. This bazaar vitality arises from the economic pressure that demands that land be used sparingly and a willingness to encourage proximity and diversity that western cities are now trying to recapture.
152. The City also has a climate that makes it easy to survive with the simplest of shelters.

153. Perhaps most important, its people have the capacity to improve their own condition. Even a low-income household, once it has a footing in a secure locale, will often progress from kutchha hut to semi-pucca house, in the space of a few months. Karachi's people are perhaps the City's greatest untapped asset; they are the focal point of the Development Plan.
A. THE URGENCY OF EARLY ACTION

154. The entire Karachi planning effort is addressed to the crises confronting the Metropolitan Region and Nation. The Development Plan is designed to provide a sound framework for public and private action, but there are certain actions which are so urgent that they have been singled out in this chapter. These are the tasks which should be undertaken immediately. They are needed no matter what decisions are taken on longer-term development. Delay in executing them is likely to seriously impair the future of the City.

155. All of the actions recommended fall into one of three categories -- actions needed to arrest the further deterioration of facilities and services that are already in dangerous condition (water supply, environmental sanitation and public transport); investigation and experimentation needed to test programme proposals on which decisions are needed urgently because of the critical nature of the programmes in question (regional water resources development and integrated community development); and actions needed to initiate the upgrading of the institutional framework that will be essential for sound development. The eight areas in which action is needed most urgently are identified below. These projects should be given immediate priority in funding.

B. WATER SUPPLY OPTIMIZATION

1. Bulk supplies

156. At the present time the main source of water supply to Karachi is the River Indus, approximately 100 miles to the east. The source works, purification plants, and main bulk supply lines are the responsibility of the Karachi Development Authority (KDA); KDA sells the water in bulk to a number of distribution authorities including the
Karachi Municipal Corporation, Ministry of Defence, Karachi Port Trust, Pakistan Western Railway, Housing Societies and the Industrial Trading Estates. The supply to each distribution agency is metered through one of 300 meters, but 100 of the meters are not working. The result is that the quantity of water billed has to be estimated, and between 15 and 30 MGD of water which is passing through the pumping chambers near the water source is not billed. There are either losses in the bulk supply system or the estimates of water delivered to the distribution agencies are incorrect, or both.

157. Efforts should be made to reduce the bulk water supply losses by:

(a) repairing all bulk water supply meters as quickly as possible;

(b) repairing service reservoirs;

(c) recommissioning the wash water recovery plant at C.O.D. Hills;

(d) checking, greasing and repairing all valves on the bulk supply system.

2. Distribution network

158. The water distribution network suffers from intermittent supplies, low pressures and a badly maintained network. Valves are frequently missing, inaccessible or inoperative. The intermittent supply has induced many customers to build underground tanks which can hold up to 10,000 gallons from where water is pumped to rooftop tanks. This is costly and leads to more water being consumed than is necessary. Maintenance of the distribution system is restricted to repairs when leakage is observed, or where there is need to operate the valves in order to vary the supply of water to consumers.

159. Ideally, a leak detection survey should be undertaken but the conditions of the system, intermittent supply, etc., render such an undertaking premature at the present time.

160. The following measures should be taken immediately.

(a) A survey of the system should be commenced to identify the locations and sized of all mains and valves. Information on the age and condition of mains should be tabulated after study of the records. This study is an essential first step in undertaking a leak detection survey.

(b) An educational campaign should be launched through the mass media with the intention of lowering the peak demand. At the present time pumping from the "bottom to top tanks" takes place at all hours. Pumping should be confined to evenings only, when water consumption is at its lowest level.
(c) Karachi water ranks among the cheapest in the world for a major city. This leads to waste of water and the failure to generate funds to expand the system. A reduction of water used for industrial and domestic purposes would be obtained if the cost was such that it encouraged efficiency or recycling. There can be no doubt that if the system is to be made to function satisfactorily, a rise in the price of water will have to be faced. The government should decide on the strategy to be adopted, to prepare the public for an increase which should come into effect within the next two years.

C. SEWERAGE OPTIMIZATION

161. The present sewer system is far from satisfactory. Only four per cent of the biological waste generated in Karachi is being treated and less than 12.5 per cent of the total bulk water supply passes through the two treatment plants. There are several areas not connected up to the trunk system. Sewage in many parts of the town flows into the surface water drains. None of the effluent from the S.I.T.E. and Landhi/Korangi Industrial Areas ends up in the sewage system and only 6.8 per cent of the trunk sewer capacity in the Malir Sewerage District is utilized.

162. Four engines with installed capacity of 3.6-4.5 MW have been provided at each treatment works. The engines, which are capable of operating on both sludge gas and diesel oil, have never been operated due to allegedly high generation costs. As a result, the sludge digestion process is impaired. There is no heating of the sludge and, in addition, one of the sludge tanks at Sewage Works No. 2 is out of commission.

163. Final effluent pumps with an installed capacity of 30 MGD have been provided for irrigation purposes at Treatment Plant No. 1, but these pumps have been utilized below capacity. In November, 1973 the two treatment plants were only handling 20 MGD due partly to the fact that the Clifton Pumping Station was not operative. There is evidence of grit being carried forward into the primary settling tanks, resulting in the complete closure for a period of ten weeks of Treatment Plant No. 2 in July-September, 1973. At Treatment Plant No. 1 one of the final settling tanks has been inoperative for some time, and the mechanical raking of the screens has stopped due to breakdown.

164. The present system is controlled by various agencies, many of which have financial, technical and managerial limitations. The maintenance of sewers is inefficient and unsatisfactory; manhole covers are missing and large quantities of sweepings are dumped into the sewers, compounding the grit extraction problem at the treatment plants.

165. The following programme should be commenced as soon as possible.

(a) Connect all sewer areas with individual, outfall lines to the trunk sewer system, e.g., North Karachi, S.I.T.E., etc.

(b) Clear the Malir Trunk sewer (there is a blockage in several areas).

(c) Provide the necessary equipment to handle the high rate of flow.
(g) Commence a systematic maintenance programme of the entire system.

(d) Improve the operating efficiency of all the pumping stations and treatment plants, optimize the treatment plants, and recommission malfunctioning plants; redesign the grit removal process to ensure that all grit is removed prior to entering the primary settling tanks. Assistance should be sought under a bilateral assistance programme, to improve the quality of sewage treatment works maintenance and management.

(g) Allow the S.I.T.E. and Landhi/Korangi Trunk Sewers to receive industrial waste, adjust the operation at the sewage treatment plants to cope with industrial wastes and institute a system of charging to recover costs.

(f) Complete the Lyari Water and Sewerage and the Sewerage Renovation Schemes as speedily as possible.

(g) Commence a training programme for sewage-works operators.

(h) Institute measures to ensure that sweepers achieve a better standard of performance.

D. DRAINAGE AND FLOOD PROTECTION

166. Thousands of households live in riverbeds and nullahs that are subject to severe flooding every five to seven years when the monsoon rains are heavy. Although the frequency of serious flooding is low, the damage is great. At least thirty lives were lost in the urban area during the 1973 monsoon and there was substantial damage to industrial, commercial and residential property. In 1967 the losses were much more severe, with hundreds of deaths and greater property damage. Even mild flooding causes sewers to overflow and the entire city is exposed to serious health hazards. Those worst affected are the poor.

167. Action should be taken immediately to establish a programme by which all drains are cleared in June, prior to the monsoon season, since the destructive effects of storms are magnified by blocked and badly maintained culvert entrances. The risk of flooding in the lower reaches of the Lyari River, one of the most vulnerable areas, should be controlled by a small check dam in North Karachi, as shown in the diagram Critical Additions to Regional Infrastructure, 1974-1985 in Chapter V. In other built-up areas that are repeatedly subject to substantial flooding, additional minor drainage works should be undertaken to get surface water runoff into existing trunk drains as directly and quickly as possible.

168. These drainage and flood protection projects should be accompanied by clearing of the worst-affected jhuggie areas in the flood plain of the Lyari River as soon as suitable alternative locations can be provided for the low-income households affected through projects such as the first Metroville described in Chapter XXIII.
E. ASSESSMENT OF REGIONAL WATER POTENTIAL

The present water demand of the City is estimated to be 150 MGD. The actual source supply is 160 MGD. The demand for the year 1985 has been estimated at 390 MGD, for the year 2000 the demand has been estimated at 1,000 MGD. At present, the only source of supply is the Indus River. The total Indus water allocation for the City is 300 MGD. After completion of the Hab Dam, the allocation will increase to 400 MGD. If new sources are tapped, there could be a gap of 300-600 MGD between the demand and resources by the year 2000. It may also be difficult to divert much more Indus water for urban use in Karachi; the requirements will continue to increase in the upper Indus River basin.

There are various alternatives for obtaining water which should be compared economically, financially and technically. These include:

- regeneration of urban waste water;
- additional use of regular Indus flows as a source of supply;
- use of peak Indus flows, with additional regional groundwater supplies;
- desalination (a study to be carried out by the International Atomic Energy Agency is under consideration).

An assessment of the benefits and costs accruing from the range or mix of alternatives must be undertaken. This implies reviewing the benefits and costs to agricultural, industrial, domestic and other users.

One possible alternative is water regeneration. The amount of water available for regeneration depends on the Development Plan. If the feasibility of the concept is established, it will reduce Karachi's reliance on the inflows for water supply and will put the regional resources to their maximum use.

In the regeneration scheme, the feasibility of which is to be studied, it is proposed to re-use water. The water will be collected and, after treatment, it will be used for irrigation. In order to accomplish this, the collection systems will have to be completed and additional treatment plants constructed. In addition, pumping stations and canals will have to be constructed for the distribution of effluent for irrigation purposes. The water is allowed to seep through the soil, undergo treatment through the natural process of purification and percolate underground, where it could be dug at suitable sites for seepage of rainwater into the ground and assistance in flood control.

It is recommended that a study of the various alternatives for the supply of water should be taken up immediately. The cost of this study will be financed partly by foreign assistance and should be completed by the most efficient use of water available in the entire Sind Region and to recommend a project in such a way that detail design can commence soon after the delivery of feasibility report.
After selection of a preferred strategy and project, it will be necessary to give guidance on a programme of incremental implementation. The natural water cycle is linked with the man-made cycle and the use of water can only be optimized by control being vested in one authority.

F. REFUSE COLLECTION AND DISPOSAL

In Karachi most of the solid wastes outside the KMC area are dumped at the nearest convenient place. This is true of industrial as well as domestic solid waste. Sweepers transfer wastes to storage bins. Although some wastes get to the collection points, a good portion is dumped privately in rivers and ditches.

Responsibility for refuse collection services is distributed between a number of authorities or boards, some of which are inefficient and poorly funded. Karachi Municipal Corporation is the largest refuse collection and disposal agency and serves approximately 75 per cent of the population. Many areas of the City are without a refuse collection service.

The system of refuse collection and street cleaning revolves around sweepers and storage bins. In 1973 KMC employed many sweepers and had 2,009 bins (average capacity, 1 ton), located in its area of jurisdiction. It is probable that somewhere between 1,500 and 2,000 tons of refuse a day is generated. Some bins offer two or more days' storage but other bins overflow daily.

In 1973 KMC had 110 trucks carrying two or 1 1/2 tons of refuse when loaded and 15 tractors with 3-ton trailers. Between 25 and 35 of the vehicles are off the road awaiting repair at any one time. KMC has let a contract for loading and carting refuse to a private firm utilizing 16 trucks.

The number of available tipping sites is limited. The present site, just to the east of the North Karachi township, involves many of the trucks in a 15-20 mile haul (30-40 mile round trip). The amount of haulage is therefore considerable. Only an estimated 750 tons of the refuse is carted daily to tip. The remainder rots in the containers, encouraging sweepers to dispose of the wastes by other methods. No effort is made to employ sanitary land fill techniques or to cover a tip with soil when it is tipped out. The following programme of immediate action is recommended:

(a) Increase the size of the refuse collection fleet with larger vehicles capable of compressing refuse. Three or four vehicles should be ordered early in 1974.

(b) Consider the possibility of requiring household bins and large containers for flats and offices in new development. This could become one of the conditions for approval to develop.

(c) Consider letting more contracts for the removal of bulk refuse until a clear policy emerges whether to operate by direct hire or contract.
(d) Adopt as a matter of policy sanitary land fill techniques and purchase at least one additional bulldozer for use at the tip.

G. UNIFIED MANAGEMENT FOR METRO POLITAN WATER SUPPLY AND ENVIRONMENTAL SANITATION

182. The maintenance and management of the water supply and sewerage system leaves much to be desired. The present installations are maintained by a variety of institutions and it will not be possible to fully optimize the existing networks until the entire system from source works to sewage treatment plants is controlled by one authority. There is need to commence work on a management study for a new entity which will operate on a commercial basis and control the use and disposition of water more effectively.

183. The new entity's responsibilities should include river management and the discharge of wastes into rivers and other bodies of water.

184. The creation of the entity is a key element in achieving the utilities and housing objectives of the Plan since it would enable the costs of water, sewerage and solid waste disposal facilities to be recovered out of user charges and assure a steady stream of income in excess of costs. The on-site costs of water, sewerage and solid waste disposal facilities in housing projects could be charged to the new authority. This would make it possible to provide fully serviced plots at prices that can be afforded by all but the lowest-income groups.

185. The current practices in refuse collection employed in the City result in serious hazards to health. The method of collection and disposal needs to be examined. The process should include an update of the 1965 Report to KMC.

186. The study should cover legislation, responsibilities, functions and procedures necessary for an entity of this type to operate effectively.

187. In order to consider all the implications of setting up a new environmental sanitation entity, it is recommended that a technical assistance request be submitted to donor agencies for assistance in financing an international firm of management consultants to undertake the studies which will be required.

H. PUBLIC TRANSPORT - UPGRADE THE BUS SYSTEM

188. An efficient, low cost, reliable public transport system is vital to Karachi's continued development. The bus system is today in serious difficulty and unless urgent action is taken to enable it to meet present demands and to establish it securely, a crisis situation will develop in the near future.
189. The most urgent requirement is an immediate large increase in the number of buses in service and a programme of fleet expansion to keep pace with future demand. Service levels should be improved to the point where bus services are sufficiently attractive to compete actively with minibuses, rickshaws, and the privately-owned vehicle. Only in this way can continuing rapid increases in road traffic be avoided, leading in turn to the need for an unending series of costly road improvement projects. Karachi should make every effort to avoid the situation where continued high expenditure on road construction is needed to keep its people and goods moving.

190. It has been estimated that to achieve these objectives, 1,880 new buses would be required over the 5-year period 1972 to 1977. This increase, if the presently available fleet is properly maintained and operated, would allow current demands to be met and would permit a gradual reduction of average vehicle occupancy to a satisfactory comfort level by 1977. The programme outlined in 1972 specified that in 1973 the fleet size should increase to put 1,350 buses on the road. Failure to take appropriate action has instead resulted in a decline in buses to about 700.

191. Such a fleet expansion programme will not be possible unless fares are increased to fully cover costs and provide an adequate return on the capital invested. Fares should be increased to 15 paisa for trips up to two miles. A graduated fare based upon an average cost of 6.5 paisa per passenger mile would be appropriate for longer distances.

192. Management and maintenance standards should be high enough to ensure efficient bus utilization. High priority should be given to a training scheme for managers and other administrative staff in both public and private sectors of the bus industry. A similar scheme is urgently needed to train diesel mechanics (presently in short supply) and other skilled staff and management in efficient maintenance practices. Further improvement in bus life and utilization could be expected from a driver training scheme to improve standards which are currently very poor.

193. All of these measures are strongly recommended for urgent action, but by far the most pressing is the need to reestablish the private bus industry while its organizational framework is still functioning.

I. AN INTEGRATED COMMUNITY DEVELOPMENT PROGRAMME

194. Less than 50 per cent of the housing stock can be regarded as "pucca housing". Only 30 per cent has piped water and 20 per cent has a sewage water carriage system serving the property. Many communities (usually the poorer ones) are deficient in social services, and, despite enormous achievements in house construction and plot development, the authorities in Karachi have not yet succeeded in developing integrated communities. Projects have been handled on an ad hoc or individual basis.

195. The city is growing at approximately 200,000 persons per annum. Of these approximately 40,000 persons can handle their own affairs. The remaining 160,000 or approximately
Households need some form of programme to assist them settle and lead meaningful lives.

1. The Metroville Concept

It is proposed that a basic urban structure module or more persons should be utilized in shaping the form of the City. The building of the first module commence as soon as possible. The module has been the name Metroville to parallel its rural equivalent, Metroville. The module allows for residential, social, economic services for all income groups and represents a viable scale for implementation. During the next few it will be necessary for Karachi to undertake the expansion of urban structure modules at an increasing There is need for at least three or four modules to completed each year to stay abreast of the new growth city.

What is needed is not just another housing scheme, well thought out incremental building programme which will be on-going and organized to achieve the growth target. Metroville Programme is being designed to demonstrate concepts and policies of the Development Plan. The issues in which potential new concepts can be tested are:

- building research;
- financial mechanisms, including the possibility of collateral loans in lieu of cash loans;
- complete administrative systems on-site, including review and co-ordination between the various agencies;
- employment generation on-site through commerce and small-scale industry, including an analysis of linkages established industry and access to credit;
- health, education and community development.

Metroville Programme will cater to a mix of income households earning up to Rs1,500 per month, but the greater portion of families served will be poor. In essence the programme will try to show that:

- water and minimum sewer services can be self-sustain-
- it is hoped that all persons will have a water and connexion, but an alternative could be to meter the water points and sell water at a rate of 10 paisas for 4 gallons);
- refuse collection can be carried out and areas kept clean;
- the property tax can cover street maintenance, ditch cleaning, etc.;
- a sense of civic pride can emerge;
- capital can be loaned to poor people at commercial rates;
(f) the recommended education and health programmes are meaningful;

(g) small-scale industries can be set up and made viable;

(h) adequate bus services and transport linkages can be established; and

(i) that the administrative skills are available to undertake programmes of this sort.

199. It is the intention to capitalize on the hopes, aims and ambitions of people and try to create a climate of improbability and opportunity. Public funds will be spent or made available in order for people to help themselves.

2. The first Metroville

200. The first site chosen for up to 50,000 people is to the north and west of the S.I.T.E. Industrial Area. It is close to town and part of a rapidly urbanizing area. Infrastructure is available. The site presents a unique opportunity to plan and develop linear streets of commercial activity because it is on the pedestrian routes from S.I.T.E. to Baldia and Aurangi.

201. In the layout planning an effort has been made to adapt the design to cope with surface water run-off at minimum cost and the higher income plots have been laid out along the spines where higher levels of infrastructure will be available.

202. A mix of development types has been allowed for in the first module which incorporates 195 acres. The breakdown on plots and household types is shown in Table III.1.

Table III.1
Metroville Project plot sizes

<table>
<thead>
<tr>
<th>Plot size</th>
<th>Number of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 sq. yds.</td>
<td>4,046</td>
</tr>
<tr>
<td>120 sq. yds.</td>
<td>1,094</td>
</tr>
<tr>
<td>120 sq. yds. town houses</td>
<td>168</td>
</tr>
<tr>
<td>240 sq. yds.</td>
<td>210</td>
</tr>
<tr>
<td>400 sq. yds.</td>
<td>37</td>
</tr>
<tr>
<td>Workers flats</td>
<td>170</td>
</tr>
<tr>
<td>Ordinary flats</td>
<td>126</td>
</tr>
<tr>
<td>Total number of households</td>
<td>5,871</td>
</tr>
</tbody>
</table>

203. The revenues generated by the Metroville project should be sufficiently in excess of land development costs to enable the programme to be self-sustaining. The total revenues expected to be generated by the first Metroville project are Rs. 163.14 lakhs, while the construction costs are Rs. 152.1 lakhs.
3. The upgrading of existing low-income settlements

The destruction of jhuggi dwellings represents a non-creative use of available resources and results in a worsening overall housing situation. It should be stopped and improvement and regularization programmes undertaken.

Studies have shown that jhuggi settlements serve a useful purpose. They usually are associated with developed social structure which provides security in uncertainty and individual need. They are frequently located near employment places and they frequently are generators of employment. They provide a shelter for the low-income family to survive at prices it can afford. The quality of housing in jhuggi areas is relatively small. The most important items are security of land, water, drainage, sanitation, employment and educational health services.

An improvement and regularization programmes should be taken immediately for the upgrading of those existing unauthorized low-income settlements with the potential to become permanent communities. The following recommendations are included in the programme:

1. Work should be undertaken immediately to finalize the selection of areas for regularization and improvement.
2. The areas should be surveyed to determine the facilities to be provided and the work to be undertaken.
3. An administrative and financial plan should be developed.
4. Appropriate forms of land tenure should be given in perpetuity. This should be accompanied by compensation for previous owners if appropriate and by the establishment of sets-asides for roads and facilities.
5. Other facilities and services should be installed as much community self-help and participation as possible.
6. The work should be the responsibility of KDA but it should involve other agencies such as KMC, the Provincial Departments of Education and Health and others.

J. UPGRADING METROPOLITAN FISCAL MANAGEMENT

Urban fiscal management is one of the dominant problems facing Karachi and needs urgent overhaul. At the present time, municipal services are rendered by the Karachi Municipal Corporation, Korangi-Landhi Municipal Committee, Cantonment Boards, 29 local councils and various special purpose ad hoc authorities.

The KMC is responsible for over 50 per cent of the city's urban services. The Corporation employs over 23,000 people and administers an area of approximately 80 square miles. The projected outlays for water, sewerage and conservation services in 1973/1974 amount to Rs.7.90 crores and are well in excess of revenue.
210. The octroi tax is regressive and the property tax is inequitable. Karachi is on the threshold of major urban expansion. Urban management must be improved if the City is to be developed as proposed.

211. The property tax based on 1967 annual rental values yields PRs. 8.50 crores to the Provincial Government. This sum represents 112 per cent of Gross Regional Product. Of this, only PRs. 2.40 crores are returned to the KMC. The KMC share is insufficient to support an adequate level of urban services to Karachi. There are many loopholes and opportunities for evading the property tax. It is recommended that it be replaced with a land or capital value tax. A provisional assessment indicates that the urban land forming the City of Karachi may be worth PRs. 600-1,000 crores. Some exemption of low value residential and agricultural land may be allowed, but it is likely that a 5 per cent tax will yield PRs. 30 crores. With increasing land values and the increase captured by the taxation system, it should be possible to bridge the resources expenditure gap and improve the level of urban services. The concept of site value rating is untried in Pakistan and there is little experience in the problems likely to be encountered in its implementation and administration. It is recommended that the Government of Pakistan apply for technical assistance to obtain advice on the specific design of such a tax with particular emphasis on the methods, approach, administrative arrangements and legislative implications which may be required to put the proposal into effect.

212. The second principal improvement that should be made immediately in the fiscal system is a system of user charges for those public services with clearly identified beneficiaries. There is no public purpose in the extravagant use of water or in private car use. An improved system of user charges for these and other services would both relate consumption more closely to the real value of services and increase public revenues. It would enable essential services to be provided to a much broader range of the population.

VI. INSTITUTIONAL UPGRADING

213. The public action recommended in the Development must be undertaken by a great variety of agencies. It cannot be effective unless those agencies co-ordinate their efforts. In the past a number of the key agencies have demonstrated their individual capacities for development but effectiveness has been undermined by lack of co-ordination. Often there have been direct conflicts. Roads provided by different agencies supposed to intersect are built at different grades; utilities installed by one agency are up-rooted later for the installation of other utilities; supply capacity is developed far beyond the capacity of sewerage system; and public lands are allotted to private groups far in excess of public or private capacity to provide proper infrastructure. The list of instances is long.

214. The scale of the growth now confronting Karachi such that continued wastage of physical and human resources in this way can no longer be tolerated. The action re...
effect essential co-ordination requires no significant expenditure, but its effect on the efficiency of all special outlays in the Region is potentially enormous.

A number of attempts have been made in recent years to co-ordinate among the public agencies responsible for major development in the Region and to link public and private action more effectively. Most recently, the Federal Ministry of Production and Presidential Affairs (Presidential Town Planning and Agroville Division) has issued Circular No. HDP.III (Vol. 19) dated 25 October 19__ reporting all relevant agencies at the Federal, Provincial and local levels to co-operate with the Master Plan and to consult the Master Plan Department in the work of preparation of the Master Plan and to consult the Master Plan Department before any development or projects in the Karachi Metropolitan Region are suggested, drawn, revised or amended. Any major change in the land use or physical development is affected or proposed in the Karachi Metropolitan Region.

This is a step in the right direction and should be followed.

The Development Plan has now matured to a point at which implementation is imminent. Domestic funds are to be mobilized for its implementation, and foreign lending agencies must be persuaded of the metropolitan significance of metropolitan investment. Construction crews are already in the field undertaking several projects of metropolitan significance. The urgency of accelerating co-ordination effort is clear.

The Policy Advisory and Steering Committee should be expanded immediately as an interim Metropolitan Planning Committee with a responsibility for ongoing plan implementation in the Karachi Metropolitan Region. Functions and structure of the interim Metropolitan Development Committee are described in Chapter XXV.
CHAPTER IV

OBJECTIVES

218. The problems of Karachi are basic ones: shortages of social overhead capital relative to the requirements of rapid economic development and urbanization, low levels of regional output per capita in essential commodities, unemployment and underemployment, household incomes that are consequently low, an extremely inequitable income distribution, shortages of entrepreneurial and management skills -- especially in the public sector at the local level -- institutional practices, which have favored the rich rather than the poor and a general lack of planning on a comprehensive scale. In combination, these problems translate into critical deficits in both the level and distribution of regional consumption, particularly in the individual areas of food, water, environmental sanitation, health services, education services, transport, shelter, domestic electricity and gas and recreational opportunities.

219. It is not sufficient for Karachi to solve its own problems, difficult though that may be. It must generate private savings for investment in other parts of Pakistan. Both the Federal and Provincial governments depend heavily upon Karachi for their revenues.

220. The vast array of difficulties to be dealt with with very limited revenues calls for a careful focusing of effort. The purpose of the chapter is to spell out the overall welfare objectives of the Plan and priorities for their achievement.

221. The initial stage of work of the Project narrowed the field to an important degree in the First-Cycle decision to pursue the overall welfare objectives of a "Distributive Investment Plan". Essentially, this decision favors a course of action that moves beyond a single-objective policy -- the maximization of aggregate consumption -- toward a multiple-objective policy that insists upon improvements in the distribution of consumption at the same time as it contains provisions for increases in aggregate consumption. These values are consistent with the views expressed by the individuals and groups that have participated in the
Projects: they are also consistent with recent shifts in emphasis in Federal and Provincial policy statements in the Annual Plan, 1972-1973.

222. Perhaps the most convincing case for adoption of the Distributive Investment Plan strategy, however, is to be found in the actual implementation of Annual Plan objectives, the equity aspects of which, on inspection, turn out to be rather limited nationwide and practically non-existent in Karachi.

223. It is estimated that only Rs.15 crores out of the entire public capital expenditure of Rs.415 crores in the 1972/1973 Annual Plan were allocated to Karachi -- Rs.10 crores from the Federal government and Rs.5 crores from the Provincial government -- and most of this was focused on the objectives of increasing aggregate consumption.

224. With these considerations as background, the development Plan, through its distributive strategy, is preoccupied with improvements in the distribution of consumption and increases in aggregate consumption, in that order of priority. Emphasis is to be on improving conditions for the lower-income groups in the ranges of Rs.0-299 and Rs.300-499 per month, in particular, with secondary emphasis on households in the Rs.500-999 group.

225. A set of priorities has been developed as a guideline for allocating to metropolitan improvement and growth the public resources that are expected to be available beyond present levels of expenditure. The priorities established imply shifts in present expenditure patterns. They indicate broadly the sequence in which additional resources should be allocated. This allocation principle is obviously generalized. It presumes a prior allocation to Karachi of a share of all public resources which reflects national and provincial, as well as local priorities.

226. Improvements in both the distribution and level of consumption in all three of these priority groups must be achieved at the lowest possible real cost and the distribution of the costs of improvement must be as equitable as possible.

227. The Plan must have acceptably low levels of risk associated with it. Its riskiness will be determined partly by the levels of public and private investment it requires and the pattern of that investment, over time, relative to public revenues and private incomes. It will be determined partly by the vulnerability of the regional structure proposed. There should be a concern with economic, social and institutional vulnerability as well as physical vulnerability.

228. The improvements achieved should not be short-lived. The Plan should make it possible to continue to improve both the distribution and the level of consumption. It must, therefore, incorporate proposals for the capital formation, human resource development and natural resource conservation needed to make sustained improvements possible.
Finally, to increase the likelihood that the programme for improving the distribution of consumption initiated in the Plan will in fact reflect the needs of groups, it should include provision for effective participation in the planning and development process.

The priorities indicated are interpreted operationally in the recommendations for individual sector programmes in Chapters XXIV and XXV.

A. PRIORITY I: SHORT RUN SURVIVAL

1. The principal objectives in this group include the following:

(a) To achieve adequate levels of employment and income and the emphasis on increasing job opportunities for the unemployed and those newly entering the labour force.

(b) To provide basic infrastructure, services, and financing for the enterprises generating employment.

(c) To facilitate the provision of adequate public transport facilities for the journeys to work.

(d) To achieve minimal adequate food supplies at prices that will permit at least subsistence consumption. The prime target groups here also should be households with monthly incomes of Pkr.300 or less.

(e) To provide the minimal adequate supplies of safe drinking water, with initial emphasis on improving water availability for households that otherwise would be able to consume only 15 gallons of treated water per capita per day or less.

(f) To provide environmental sanitation and flood protection with the initial emphasis on households without adequate sewerage and in areas subject to major flooding during monsoon rains.

(g) To undertake the fiscal and organizational changes essential to the execution of other programmes in this area, including the re-establishment of effective coordination among public agencies, a shifting of water supply and environmental sanitation to a metropolitan authority operating on a commercial basis and fuller utilization of local revenue potential as recommended in the immediate task identified in Chapter III.

B. PRIORITY II: SUSTAINED IMPROVEMENT AND GROWTH

1. Once action is underway toward achievement of the objectives for short run survival, the objectives should be
(a) To achieve the levels of production, employment and income necessary to generate public and private savings and to encourage investment in sustained improvement and growth in Karachi, in the rest of the Region and in priority areas elsewhere in the nation. Employment programmes should be concerned with the educated unemployed and underemployed as well as the target groups emphasized under Priority I.

(b) To expand the essential related programmes including financing, technical support and technical training services to support small enterprises and households in their efforts to improve their own living conditions and to provide the infrastructure needed by the establishments generating employment.

(c) To provide key health services to make access to health services more equitable and to increase productivity. The emphasis here should be on households with monthly incomes of PRs.500 or less. The programme emphasis should be on preventive services to complement the water supply and environmental programmes that are a basic part of the overall strategy to improve health.

(d) To provide the essential services to establish a widespread base of literacy, to provide more equitable access to educational opportunities and to relate education and mass communication more effectively to the skills needed for economic growth and the upgrading of basic urban living conditions. The emphasis here should be on primary and secondary education, adult literacy, technical training and community development programmes. Special provision should be made to enable low-income households to send to school children who would otherwise be denied an education because they are needed to support their families economically.

(e) To develop the housing programme needed to realistically reflect the socio-economic structure of the metropolitan population and to emphasize support for households to help them to improve their own housing, rather than the provision of public housing, with an initial focus on households with monthly incomes of PRs.500 and less. The Plan should make it possible to provide properly serviced plots for all households in the metropolitan area by 1985, at standards commensurate with household incomes, accepting the fact that some households may be sharing plots with other households, as their tenants or as joint families. It should make it possible to eliminate a large part of the need for jhuggi dwellings on improperly serviced plots in unauthorized areas by 1985 or soon thereafter. In developing and disposing of plots, highest priority should be given to the types of plots and services required by households in the monthly income groups PRs.0-299, PRs.300-499 and PRs.500-999. In order to meet the needs of lower-income groups effectively, however, it will be necessary to increase the total supply of serviced plots to a point where the needs of most income groups are provided for. If increases in supply are concentrated only on the smaller plot sizes normally suitable for low-income groups, middle- and upper-middle-income households are likely to outbid low-income households for this limited supply, with the result that the low-income groups will continue to be forced into squatter settlements.
implement a public transport programme beyond the
trip-to-work programme under Priority I to improve
job opportunities and urban accessibility
with initial emphasis on households with monthly
Rs.500 or less.

and further the food supply and distribution
needed to assist in achieving desirable levels of
food consumption for the entire metropolitan popu-
lation to the focus on the lowest-income groups
in Priority I, with emphasis on households with monthly
Rs.1,000 or less.

provide electricity and gas for as many of the
area’s households as possible, with initial
those households with monthly incomes of Rs.500
for whom the provision of these services on a com-
mercial basis would represent a substantial reduction in
cost.

accomplish the fiscal and organizational changes
for the implementation of the other programmes in
including the establishment of metropolitan plan-
permanent part of the machinery of government, the
ment of a metropolitan development policy group and
long-term fiscal and institutional changes

PRIORITY III: ADDITIONAL PROGRAMMES
NEEDED TO UPGRADE THE QUALITY OF
URBAN LIFE

These programmes should include but need not be limited
to the following:

* expand facilities for recreation with emphasis on
  community facilities and highly localized small-scale
  for households with monthly incomes of Rs.500 or
  recommended in Chapter XVI.

* provide facilities for domestic and foreign tourism,
  preserve and enhance areas of high environmental
  including selected inland sites as well as the greater
  shoreline. There should be a long-term upgrading
  of the urban environment and, to the ex-
  it is feasible, the Region's desert environment.
  Finally, this, together with the concern for sanita-
  for bringing under control the sewage that is
  urban environment and the shoreline and the
  that is degrading both urban and regional topography.
  it is economic and desirable to regulate ground-
  effectively and to reuse solid and liquid urban
  Serious consideration should also be given to large-
  environmental rehabilitation to bring the Region’s
  areas into fodder cropping, intensive cash cropping
  afforestation.

* establish higher standards for the design of pub-
  emhasis on those areas in which the degra-
  the metropolitan environment has been most severe.
(High design standards should, of course, be of concern in programmes under Priorities I and II to the extent that they are resource-conserving. The concern under Priority III is with environmental upgrading that may require greater resource consumption than would be otherwise involved.)

(e) To achieve a higher-amenity physical environment with acceptably low levels of congestion and noise, the organization of spaces, structures and landscaping should make it possible to control micro-climate in the Region's urban areas to achieve acceptable comfort levels. The spatial organization of activities and facilities should make it possible to achieve a clear overall physical form for the Metropolitan Area, reflecting clearly the functions of its sub-areas and facilitation orientation within them; it should also make it possible to achieve an urban environment that is of high architectural quality.

234. Although aesthetic concerns must be given a lower priority than the improvements necessary for a minimum adequate standard of living, they should not be neglected. The City needs projects that demonstrate its capability to elevate its spirit as well as its material well-being; the City's people need concrete evidence of qualitative as well as quantitative achievement; potential foreign investors also are likely to be encouraged by a concern for environmental quality, provided it is not extravagant and in violation of priorities for meeting the City's most urgent social and economic needs.
CHAPTER V

REGIONAL GROWTH

A. THE PHYSICAL ENVIRONMENT

The present chapter sketches a regional strategy up to 1985 and discusses, very tentatively, possible development after that. It deals with the Region, as defined in the

Regional Plan, as a whole. The total area of the Region is just under 7,600 square miles. The Karachi Metropolitan Area

(standing from Hab Chauki through Dhabeji/Gharo) is treated separately because metropolitan growth is dealt with in

Chapter VI.

The major physical features of the Region are described in previous reports. With the exception of Karachi, on the coast, and an agricultural area in its southeastern portion, the Region is semi-desert. Its physiography imposes very few restrictions on urban expansion. To the east, north and north-

west of Karachi lie a series of longitudinal hills and valleys. The Karachi Plain at the southern fringe of this hilly tract consists of a series of low hills and shallow valleys extending along the coast. Northwest of Karachi lies the Hab-River Valley and the Hab range in Lasbela District. West of the latter there is an extensive eroded area of sandy deposits which terminates in the low-lying coast and beaches of Gadani-Somniani.

Master Plan Department, Karachi Development Authority, Master Plan for Karachi Metropolitan Region, First Cycle


1) September 1972 (pp. 48-53). Study of Climate --

Part II (MP/RR/6). Land Forms and Drainage Basins in Karachi

Region (MP/RR/9). Mineral Resources of Karachi Region (MP/RR/11),

Geological Characteristics of Karachi Region (MP/RR/11),

Tectonic and Earthquake Occurrences in Karachi Region (MP/RR/11),

Natural Resources (Report No. 5.15). October 1971.

Mead, A.M., Karachi Region: Its Resources (T/600). 6 Novem-

ber 1972.
237. The deltaic plain, southeast of Karachi, is agricultural, but cultivation there is constrained by waterlogging and high salinity. The lower section of the plain, bordering the sea, is an extensive swamp region with a complex system of tidal creeks.

238. The area most likely to accommodate future urban growth up to the turn of the century — the Karachi Plain — is interrupted by three significant rivers, the Hab, the Lyari, and the Mallir, all crossed relatively easily. Even the Jhel-Manghopir hills on the west of the Karachi Plain can be traversed readily if there is pressure for expansion into Lasbela in Baluchistan. The hills to the north and northeast in Sind-Kohistan provide relief from the immediate desert surroundings of the City and may eventually be utilized for afforestation.

239. The two major lakes in the Region at present, Kairi and Haleji, are capable of being developed for recreation as well as water supply.

240. Two coastal areas, in particular, provide a much-neglected opportunity for recreation and tourism — the Gadani-Sonmiani coast which has a series of extremely fine beaches, and the delta south of Pipri with its inlets, islands and historic monuments.

241. The Arabian Sea is also a regional resource. It promises to be an abundant source of food supply and deep-sea fishing, as yet unexploited, and should be considered in relation to the Region’s tourist and recreation potential.

242. The Region’s major mineral resources include natural gas, limestone, silica sand, manganese, sand and gravel. There are deposits of low-grade coal and other minerals, in varying quantities. Its gas may eventually be brought into use to supplement natural gas from the Sui fields, further north. Its limestone, sand and gravel are important in cement-making and construction, and limestone will become important for steel-making when the new Mill at Pipri comes into production. Its other minerals are already important for paint-making, glass-making, ceramics, the manufacture of electrical equipment and other industrial purposes.

243. The Region’s soils are an asset obscured by its present desert character. In the valley of the Hab River, in the upper Lyari valley, in the Gadap Plain, in the Mallir and Khadeji valleys and in the vicinity of Jungshahi, Jhimpir, Thano Bula Khan and the upper Baran River there are excellent soils that could be brought into use in intensive agriculture if they could be watered adequately.

244. The Region’s climate is hot and arid with a mean annual temperature of about 90 degrees Fahrenheit. Sea breezes, however, help to moderate the effects of this. Temperatures rise above 110 degrees Fahrenheit inland from the coast during May, June and July. Dust storms occur from April to September with highest frequencies in May and June. Winters are pleasant with lower temperatures and sunshine.
145. Rainfall is limited and highly variable. The mean annual precipitation is six to eight inches in the eastern plain and five inches in the western area, except in Lasbela, where it is over eight inches. In the winter months rainfall is rarely more than one-half inch per month. Humidity, high near the sea and decreasing inland, is highest in July and August, averaging 85 per cent relative humidity; it drops to about 50 per cent in winter.

146. Water is the regional resource that threatens to impose the most severe constraints on growth. The only significant natural resource of fresh water in use at present is the Indus River. A dam designed to utilize water from the Hab River is under construction. The waters of the Indus irrigate part of the Region's agricultural area and provide water for domestic, industrial and other purposes in the City.

147. The potential for regional water resource development and for the utilization of the Region's soils for intensive agriculture is taken up more fully in Chapters VII and IX.

B. THE REGION'S PEOPLE

1. Population Growth

148. According to the Census of 1961 the total population of the Region was 2,259,193 -- 1,987,385 urban and 271,808 rural. The population of Karachi District constituted approximately 90 per cent of this total and almost 100 per cent of the urban population. The Region experienced very rapid population growth over the three decades 1941-1971, primarily because of the influx of migrants from India into the Karachi Metropolitan Area following the creation of Pakistan in 1947. It is estimated to have reached 4,448,000 in 1976.

149. Census data and projected estimates suggest that the average annual compound growth rates for Karachi District, which dominates the Region's urban population, were in the decades 1941-1951, 1951-1961, and 1961-1971 10 per cent, 7.1 per cent and 5.1 per cent respectively. The estimated urban population of 4,200,000 for the Region in 1974 suggests a further decline in the annual urban growth rate, down to 4.7 per cent for 1971-1974. During the two decades 1941-1961, the growth rates for the total population of West Pakistan were 1.8 per cent and 2.3 per cent, respectively, while the growth rates for West Pakistan's urban population were 2.7 per cent and 4.9 per cent.

150. The role of in-migration in the Region's urban growth is indicated by figures for 1951 and 1958. During that period the population of Karachi grew by approximately 714,000. An estimated 330,000 of this (46 per cent) was due to natural increase; 384,000 (54 per cent) was the result of in-migration from India and 170,000 from other parts of Pakistan. Estimates for 1970 and 1974 suggest that in-migration constituted approximately 47 per cent of urban growth in this most recent four-year period.
251. Although the Region's agricultural population may, if regional water management can be improved, increase substantially, future regional growth is expected to be dominated by the urban growth of Karachi.

252. In arriving at plausible upper and lower limits for future population, it must be recognized that there is only limited scope for influencing the growth of a metropolis as large as Karachi with an established growth momentum. The level of investment that can be used by public entities as leverage to influence the rate of the City's growth is low relative to total investment, and non-economic institutional instruments designed to curb or accelerate growth are unlikely to be very effective. Even if migration into the Metropolitan Area were to cease entirely at the beginning of 1975, a rate of natural increase of approximately 2.5 per cent would result in a metropolitan population of 5.5 million by 1985.

253. In planning for future population growth a range of population levels must be envisioned because of the uncertainties inherent in all demographic projections. That range must encompass the upper and lower limits of growth judged to be plausible. Within the plausible range it may be possible, in some situations, to identify what is considered to be a desirable growth range. The criteria upon which this might be based include factors such as labour productivity in alternative urban and rural locations, the ability of government to provide facilities and services in alternative locations, the capacity of the private sector to provide its own facilities and services, the availability of space of acceptable environmental quality, the expected social, political and other consequences of population concentrations of various sizes, and so on.

254. In the absence of satisfactory information on such factors, including data on the productivity of individual locations in Pakistan, and in the absence of a national urbanization policy, the problem of identifying a desirable level of urban growth for the Karachi Region could not be fully resolved. Instead, population projections based on what seemed to be reasonable levels of economic growth in Karachi were made and compared with purely demographic projections. Federal Planning Commission projections for key industries up to 1985 were examined and an approximation of Karachi's share in the growth of these key industries was established. A projection for total Karachi employment was arrived at on the basis of ratios of other employment to employment in the key industries; an estimated labour force participation rate was then used to arrive at a projection for Karachi's population for 1985. To provide an alternative projection for urban population based on foreseeable economic growth, gross local product was projected to 1985; estimates of productivity by sector were then used to derive a projection for employment and the labour force participation ratio referred to earlier was used to arrive at a projected urban population.

2/ Now the Planning Division in the Ministry of Finance and Planning.
255. Four alternative demographic projections were developed also — a geometric projection, a modified geometric method with migration recognized explicitly, a cohort-survival projection and a "shares" projection.1

256. The two urban population projections based on projected economic growth were reconciled judgementally with the purely demographic analysis to arrive at a projected urban population range of 6.4 million to 7.3 million for 1985 and a range of approximately 11 million to 15 million for the year 2000. In addition to this, Hyderabad is expected to grow to somewhere in the vicinity of 2 million by 1985 and 3 million by 2000. For planning purposes, working estimates of 6.9 million for 1985 and 12.6 million for 2000 were used for urban population in the Region (excluding Hyderabad).

257. Projections for the Region's rural population were based on the rural population needed to provide milk, meat, fruit, vegetables and basic non-perishable foodstuffs for the projected urban population, constrained by the availability of cultivable soils and water for irrigation. It has been assumed that the water regeneration system proposed in Chapter VII will be implemented successfully and that this will result in an additional 82,000 acres being brought into production by 1985. With an assumed average labour intensity in agriculture of approximately 1.25 acres per worker this would generate agricultural employment for approximately 63,500 workers. Assuming a ratio of approximately one non-agricultural job for every three agricultural jobs in rural areas2/ this would support 21,000 non-agricultural workers. Total additional employment generated would therefore be approximately 84,500. Assuming a labour force participation ratio of approximately 0.5 in rural areas this would support a total additional population of 169,000. Coupled with the 1974 rural population of 248,000 the rural population in 1985 would be of the order of 417,000.

258. For simplicity in related computations, mid-points in the projected ranges of population have been used for planning purposes. These mid-point estimates are shown in Table V.1, Karachi Region population growth, 1974-2000. As with all projections, these are likely to be subject to revision as time elapses and as additional data (including the results of a full evaluation of the feasibility of the water regeneration system) become available. They should be regarded as only crude guidelines for current planning purposes.

259. As Table V.1 shows, the total population projected for the Region for 1985 is approximately 7,100,000 — 6,900,000 urban and 200,000 rural. The corresponding projection for the year 2000, which is even more tentative, is approximately 14,200,000 — with approximately 12,600,000 urban and 1,600,000 rural.

2/ Master Plan Department, Karachi Development Authority. Master Plan for Karachi Metropolitan Region: First Cycle Report — Volume Two, Trends and Issues. September 1972, p.87. The figure of 0.8 workers per acre is in between the high and low ratios shown there.
Although the medium projection of 12.6 million urban population by the year 2000 may seem high, it should be noted that it presumes a decreasing annual growth rate—down from 4.6 per cent for the period 1974–1980 to 4.1 per cent for the period 1985–2000. The estimated growth rate for the period 1961–1974 was approximately 5.3 per cent. The share of urban population in the Karachi Region to the total population in Pakistan is projected to be increased from 6.3 per cent in 1974 to 7.7 per cent by 1985, and to 9.7 per cent by 2000. The share of the Region's urban population to Pakistan's urban population is not expected to change significantly over this period, reflecting an assumption of substantial urban development in the rest of Pakistan.

Table V.1
Karachi Region population growth, 1974–2000

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Total population (millions)</td>
<td>4.448</td>
<td>5.792</td>
<td>7.317</td>
<td>14.225</td>
</tr>
<tr>
<td>Total population average annual growth rate (%)</td>
<td>4.5</td>
<td>4.5</td>
<td>4.8</td>
<td>4.5</td>
</tr>
<tr>
<td>Urban population (millions)</td>
<td>4.200</td>
<td>5.500</td>
<td>6.900</td>
<td>12.600</td>
</tr>
<tr>
<td>Urban population average annual growth rate (%)</td>
<td>4.7</td>
<td>4.6</td>
<td>4.6</td>
<td>4.1</td>
</tr>
<tr>
<td>Average annual rate of natural increase - urban (%)</td>
<td>2.5</td>
<td>2.45</td>
<td>2.40</td>
<td>2.25</td>
</tr>
<tr>
<td>Net in-migration for previous period - urban (millions)</td>
<td>+.330</td>
<td>+.611</td>
<td>+.665</td>
<td>+2.571</td>
</tr>
<tr>
<td>Rural population (millions)</td>
<td>.248</td>
<td>.292</td>
<td>.417</td>
<td>1.625</td>
</tr>
<tr>
<td>Agricultural population (millions)</td>
<td>.180</td>
<td>.212</td>
<td>.307</td>
<td>1.089</td>
</tr>
<tr>
<td>Rural population average annual growth rate (%)</td>
<td>1.6</td>
<td>2.8</td>
<td>7.4</td>
<td>9.5</td>
</tr>
<tr>
<td>Average annual rate of natural increase - rural (%)</td>
<td>2.8</td>
<td>2.8</td>
<td>2.7</td>
<td>2.5</td>
</tr>
<tr>
<td>Net in-migration for previous period - rural (millions)</td>
<td>-.013</td>
<td>0.0</td>
<td>+.084</td>
<td>+1.021</td>
</tr>
<tr>
<td>Share of Region's urban population in total Pakistan population (%)</td>
<td>6.1</td>
<td>7.3</td>
<td>7.7</td>
<td>9.7</td>
</tr>
<tr>
<td>Share of Region's urban population in Pakistan's urban population (%)</td>
<td>20.7</td>
<td>20.7</td>
<td>20.8</td>
<td>21.1</td>
</tr>
</tbody>
</table>

Source: Karachi Planning Project estimates. Note that growth rates for 1974 refer to the 1970–1974 period; other growth rates refer to the preceding periods shown in the table.

The estimates for migration shown in Table V.1 were calculated by one-year steps, as the difference between the estimates of total population in each of the components and estimates of natural increase. Consistent with high levels of past migration into Karachi, the projections indicate that 1.3 million will migrate to the urban areas of the Region between 1974 and 1985, followed by an additional 2.6 million by the year 2000. Population movement in the rural areas depends to a large extent upon the introduction of additional
irrigation capacity. In the past, the population migration from the rural areas of the Karachi Region was primarily into Karachi, a development that is likely to continue in the short-run future. However, with the establishment of the Hub Dam and other irrigation systems, this trend is expected to have been modified considerably by 1985. The highest rate of rural in-migration is expected to occur between 1985 and 2000. Approximately 11.1 million in-migrants to rural areas are expected between 1974 and 2000. All estimates assume labour-intensive agricultural conditions.

2. Household income distribution

262. Condensed projections of income distributions by percentage of households in individual income groups are presented in Table V.2 below, for both the urban and rural populations in the Karachi Region.

Table V.2

<table>
<thead>
<tr>
<th>Income groups (PSh.)</th>
<th>Percentage of households</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban areas</td>
</tr>
<tr>
<td>less than 300</td>
<td>44.52</td>
</tr>
<tr>
<td>300 - 999</td>
<td>35.35</td>
</tr>
<tr>
<td>500 - 999</td>
<td>14.42</td>
</tr>
<tr>
<td>1000 - 1999</td>
<td>3.43</td>
</tr>
<tr>
<td>2000 and more</td>
<td>2.28</td>
</tr>
</tbody>
</table>

Source: Karachi Planning Project estimates.

263. The distributions are shown graphically in the diagram Karachi Region: Urban and Rural Household Income Distribution, 1970-1985. For the urban population, the percentages of the households in individual income groups are not the same as the percentages of persons in these groups, since household size varies with income.

264. The projected rural income distribution is, of course, even more inequitable than its projected urban counterpart. The implications of the forecasts for rural income distribution in terms of the living standards that can be expected in rural areas are even more ominous than those for the urban areas. By 1984/1985, almost 90 per cent of all rural households will still be in the PSh.0-499 per month group and approximately 67 per cent will be in the lowest group, with monthly incomes of PSh.300 or less.
C. THE REGIONAL ECONOMY

The Region is dominated by Karachi economically, and demographically. In 1961, according to the census, Karachi District had 97 per cent of the Region's non-agricultural labour force.

In terms of employment, the rest of the Region is primarily agricultural. If the whole of the Karachi District is excluded, the agricultural labour force constituted approximately 72 per cent of the rest of the Region's civilian force in 1961.

Gross regional product estimated for 1974 constitutes approximately 15.6 per cent of the estimated gross domestic product of Pakistan. Gross regional product per capita is approximately 2.3 times estimated gross product per capita of the nation as a whole. Gross regional product per capita of the Region's urban areas is approximately 2.6 times that of its rural areas. The economic dominance of Karachi in the Region is reflected in the 96 per cent share of non-agricultural product in gross regional product.

Manufacturing, trade, services, transport, construction, commerce and utility operations (which contribute to the Region's non-agricultural product in that order), occur primarily in the Karachi Metropolitan Area.

The only other significant manufacturing near the Region, on its eastern edge, is in Hyderabad, which is also an administrative and service centre for a relatively rich agricultural hinterland. Hyderabad has two industrial estates and important individual industrial establishments such as the Zeal Park cement factory, Wazir Ali industries and the Sandor pharmaceutical and chemical complex. The Hyderabad Industrial Estate was established in 1952 and covers an area of 1,260 acres. It is outside and on the southeastern side of Hyderabad. So far only 700 acres have been utilized and the rate of utilization is not high. It has a total of 48 factories (large and small), chiefly textiles, tanning, food processing (flour), plastics, engineering, and metal working (canning and blades) with 15,000 to 20,000 employees. The Kotri Industrial Estate was established in 1965 and covers an area of approximately 1,000 acres. It is on the western bank of the Indus River, on the main highway. Benefit from the tax holiday that has been in effect until recently, numerous industries have been established in the Kotri Estate and approximately ten were under construction in 1971.

In addition to large-scale manufacturing, a number of small-scale industries are important in the Hyderabad area, including indigenous Sindhi cottage industries such as embroidery work, glazed pottery, and the lacquer work of Mala, other handicrafts, shoe-making and carpet-making.

The figures for Hyderabad's employment (approximately 19,000) and value-added (approximately Rs.12 crores) in large-scale manufacturing in 1967 compare with employment of approximately 142,000 and a value-added
of approximately Rs.155 crores in large-scale manufacturing for Karachi in the same year.5/

272. The non-agricultural labour force outside the Karachi District was only of the order of 20,000 in 1961. With the exception of Bhabeji-Gharo (which is included in the Karachi Metropolitan Area for future planning) and Thatta, the Region's service centres outside the main Karachi conurbation are small townships (none had a population of more than 3,500 in 1961) with no significant manufacturing and with very small-scale administrative, trade and service functions — in many cases, not much more than a cluster of small stores and tea shops, a school, a dispensary, a police outpost, a post office, several small mosques and township housing. Some, such as Junghab, contain the remains of abandoned attempts at manufacturing. Even Thatta, the largest centre other than the Bhabeji-Gharo complex, grew at only 2.8 per cent between 1951 and 1961, a rate possibly below the rate of natural increase, suggesting that there may have been some out-migration.

273. Existing agricultural employment may be deceptively low as an indicator of the Region's agricultural potential. Only 768 square miles of the Region's total of approximately 7,500 square miles (roughly 10 per cent) are cultivated. Cultivated areas are distributed irregularly. Almost all of them are east of the Hab River. Most of them have lower indices for cropping intensity and intensity of irrigation than do agricultural areas in other parts of Sind or in Pakistan as a whole. Only 31 per cent of the cultivated acreage is irrigated. Labour productivity in agriculture in most parts of the Region is somewhat lower than other parts of Sind, east of the Indus, and considerably lower than in the best agricultural areas of the country. The Region presently is supplying only 25 per cent to 40 per cent of the food requirements of the Karachi Metropolitan Area (excluding meat, milk and poultry).

274. Fishing is another of the Region's primary activities whose present level may be deceptively low. In 1961, approximately 6,900 workers were employed in fishing in the Karachi District, constituting about 60 per cent of all employment in fishing in West Pakistan. Output from fishing in 1968/1969 constituted approximately 3 per cent of the gross product of Karachi District, approximately 85 per cent of the output from fishing in Sind and approximately 67 per cent of the output from fishing in West Pakistan. Fish is becoming increasingly important as a food source on a worldwide scale, yet the Arabian Sea is barely developed as a fishing ground.

275. At present, mining plays a very minor role in regional employment and output. Private groups have taken out a large number of mining leases but the Region's mineral resources are not yet fully surveyed. There are substantial deposits of limestone, silica sand, gravel and manganese. The first three of these will assume increasing importance as the demand for construction materials increases with the growth of the City; limestone and manganese are likely to be important for steel-making in the new Mill that is to be established at Pipri.

Forestry in the Region is very limited. Forest areas are restricted to lands close to the Indus; forestry in regional land use is negligible.

The development proposed for the regional economy is expected to bring about a more equitable distribution of employment opportunities, household income and urban services within the Region itself. Regional output and regional per capita output are expected to increase by approximately 50 per cent and 29 per cent, respectively, in the 11-year period 1974-1985. Changes in the composition of non-agricultural (predominantly Karachi) output are relatively minor and will be described in Chapter VI. Agricultural output is expected to increase to approximately 1.4 times its 1974 level on the assumption, noted earlier, that it will be possible to use urban waste water and improved ground-water recharge to bring a large additional acreage into agricultural production.

The regional output and employment projected for the years 1974-1985 are shown in Table V.1.

Non-agricultural product and employment were estimated in a manner referred to earlier in the description of expected population growth. Through a reconciliation of these estimates to employment projections for key industries and direct estimates of projections of regional product, with similar assumptions for labour productivity in both sets of estimates, output was produced as a function of the growth rate of population and household income.

The share of Karachi’s product to gross domestic product for Pakistan as a whole is expected to increase, consistent with the increasing share of Karachi’s population. The growth rate of per capita product in the Region’s areas is estimated to be slightly lower than in Karachi. Urban per capita product in the Region is expected to be much higher than it is elsewhere in the Region, and the differences will not be significantly altered by 1985.

It is expected that regional product in the rural non-agricultural sector in the rural areas of the Region were derived from agricultural labour force estimates based on projects of non-agricultural to agricultural labour in rural areas and estimates of non-agricultural labour productivity.

Full employment in Karachi was reported in the 1961 census to be approximately 1 per cent, higher than in most other cities in Pakistan. The level of unemployment, however, is expected to be even higher with continuing in-migration. Over the full unemployment statistics recorded by the labour force surveys are not reliable indicators of the degree of non-employment. For unemployment and underemployment at present may together represent somewhere between 20 per cent and 30 per cent underutilization of labour with the presently low level of female participation in the labour force.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>4.448</td>
<td>5.792</td>
<td>7.314</td>
</tr>
<tr>
<td>Rural</td>
<td>4.200</td>
<td>5.500</td>
<td>6.900</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>7.566</td>
<td>11.386</td>
<td>16.103</td>
</tr>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>298</td>
<td>372</td>
<td>410</td>
</tr>
<tr>
<td>Non-agricultural</td>
<td>7.268</td>
<td>11.014</td>
<td>15.693</td>
</tr>
<tr>
<td>Urban areas</td>
<td>7.400</td>
<td>11.160</td>
<td>15.740</td>
</tr>
<tr>
<td>Rural areas</td>
<td>166</td>
<td>226</td>
<td>363</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gross regional product per capita (rupees)</th>
<th>1974 est.</th>
<th>1980</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1.701</td>
<td>1.966</td>
<td>2.202</td>
</tr>
<tr>
<td>Urban areas</td>
<td>1.762</td>
<td>2.029</td>
<td>2.281</td>
</tr>
<tr>
<td>Rural areas</td>
<td>669</td>
<td>774</td>
<td>821</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average annual compound growth rate of GDP (%)</th>
<th>1974 est.</th>
<th>1980</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>5.3</td>
<td>7.0</td>
<td>7.2</td>
</tr>
<tr>
<td>Urban areas</td>
<td>5.6</td>
<td>7.1</td>
<td>7.1</td>
</tr>
<tr>
<td>Rural areas</td>
<td>2.7</td>
<td>5.3</td>
<td>10.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Average annual compound growth rate of GDP per capita (%)</th>
<th>1974 est.</th>
<th>1980</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0.96</td>
<td>2.4</td>
<td>2.3</td>
</tr>
<tr>
<td>Urban areas</td>
<td>0.9</td>
<td>2.4</td>
<td>2.4</td>
</tr>
<tr>
<td>Rural areas</td>
<td>1.07</td>
<td>2.5</td>
<td>2.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Share of GDP to GDP in Pakistan (%)</th>
<th>1974 est.</th>
<th>1980</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>15.6</td>
<td>17.1</td>
<td>18.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment (thousands)</th>
<th>1974 est.</th>
<th>1980</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1.374</td>
<td>1.832</td>
<td>2.315</td>
</tr>
<tr>
<td>Urban areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.291</td>
<td>1.686</td>
<td>2.107</td>
</tr>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>41</td>
<td>51</td>
<td>61</td>
</tr>
<tr>
<td>Non-agricultural</td>
<td>1.250</td>
<td>1.635</td>
<td>2.046</td>
</tr>
<tr>
<td>Rural areas</td>
<td>83</td>
<td>146</td>
<td>208</td>
</tr>
<tr>
<td>Agriculture, forestry and fishing</td>
<td>60</td>
<td>106</td>
<td>154</td>
</tr>
<tr>
<td>Non-agricultural</td>
<td>23</td>
<td>40</td>
<td>54</td>
</tr>
</tbody>
</table>

Source: Karachi Planning Project estimates. Note that growth rates for 1974 are for the period 1973-1974; other rates are for the preceding period shown in the table.

283. With the exception of the forecast increase in agriculture the projections of regional economic variables contain no great surprises, for they confirm the past and present role of Karachi as the foremost engine of development in the Pakistan economy. It is, as it will continue to be, the nation's largest centre of trade and industry, a ranking guaranteed by its strategic position as the only major seaport in Pakistan. During the 26 years since Partition, this position has fostered a rapid rate of growth in Karachi. It has also led to the development of a relatively diversified economy. The metropolitan economy will be described more fully in Chapter VI.
THE REGIONAL SETTLEMENT PATTERN

The dominance of Karachi and the importance of Hyderabad outside the original regional study area, relative settlements in the Region, is clear.

Karachi will be dealt with separately, in Chapter VI.

Hyderabad was the second largest city in Sind and the second in Pakistan in 1961. Its 1974 population is estimated to be 800,000. According to this estimate, release of the 1961 Census figure of 434,537, Hyderabad grew at an annual compound growth rate of approximately 5.3 between 1961 and 1972. As indicated in the earlier section of the Regional economy, it is a major administrative centre for the principal agricultural land and is becoming increasingly important as a service centre.

Thatta, with a population of approximately 13,000 in 1961, is estimated to have had a population of approximately 22,000 as a service centre for the agricultural areas in interior Sind, the most important of which lie to the south, in the Thatta delta. It is of historic importance also, as noted later. The town lies on the National Highway that links the adjoining districts with Karachi, Hyderabad and the rest of the country. Community facilities such as a hospital, dispensary, a college, post office, a telephone and telegraph office are available there.

The Dhaobiji/Gharo area is an anomaly. It is a relatively small settlement which owes its existence almost entirely to the tax holiday that was granted to encourage industrial development outside major cities throughout the nation. Dhaobiji and Gharo are about seven miles apart; together they had a population of approximately 9,000 in 1961 according to the 1961 Census. Present population is estimated to be in the vicinity of 15,000. At least 15 manufacturing plants have been established in the Dhaobiji/Gharo area, including textiles, cigarettes, industrial gases and paper products. They receive materials from Karachi, other parts of Sind, and up-country. A firm locating in the area can, in effect, stay close to Karachi, as it could while still enjoying the benefits of a tax holiday for being outside the District and of the transport and utilities that are available on the western side of the City (but not on the eastern side). Community facilities such as dispensaries, a post office, schools are not yet available in Dhaobiji but are in Gharo. Dhaobiji is served by the main rail line to the
north and by National Highway No.1. Gharo is on National Highway No.1 but off the main rail line. Both towns are close to the main water supply, electricity and gas lines coming into Karachi from the east. The Dhabeji/Gharo area is at the outer limit of the travel-time zone that permits reasonable daily interaction with Karachi. (Door-to-door commuting time is about 90 minutes each way, allowing for a transfer from train to bus at both ends.)

289. In the rest of the Region (excluding Karachi, Dhabeji/Gharo and Thatta), there were in 1961 according to the Census no settlements with a population of more than 3,500 and only eight with populations larger than 1,000. The small settlements with relatively high annual growth rates between 1951 and 1961 included Mirpur Sakro (6.1 per cent with a 1961 population of approximately 3,200), Gadap (6.1 per cent with a 1961 population of approximately 1,000), Gajju (5.1 per cent with a 1961 population of approximately 1,100), and Gadani (5.7 per cent with a 1961 population of approximately 1,200). Several settlements lost population in the 1951-1961 decade; the major decrease was in Jhimpir, which previously had a predominantly Hindu population.

290. Existing regional settlements and land use are shown in the map Regional Land Use 1970.

E. DEVELOPMENT FOR 1974-1985

291. Urban growth in the Region up to 1985 should be concentrated in and around the Karachi Metropolitan Area, extending from Hub Chauki to Dhabeji/Gharo. Hyderabad, just outside the Region, is likely to grow substantially also. Minor growth can be expected in Thatta. The Region's agricultural potential should be exploited as fully as possible.

292. The development proposed is sketched in the diagram Regional Growth Strategy 1974-1985. The areas identified for major agricultural development are areas of Class A and/or Class B soils in which it is expected to be possible to utilize urban waste water for irrigation or improve groundwater management considerably.

293. Alternatives for the distribution of urban development were considered and, indeed, a somewhat different strategy may become feasible after 1985 but the advantages of consolidating urban growth up to 1985 in and around Karachi appear to be overwhelming.
In pursuing the basic development objectives identified earlier, the strategy proposed emphasizes the fullest possible use of existing infrastructure as a prerequisite for new investment, achievement of the highest possible productivity within the constraints imposed by underlying dispositional concerns and the maintenance of acceptably low risk in the early years of development. The characteristics of Karachi which make it the sensible focus of the next stage of the region's urban growth include the following:

1. It is the only seaport for the entire country.
2. Karachi itself constitutes a very large market for products of all kinds.
3. Locations in Karachi enjoy low transportation costs for all output using materials brought through the port or originating in the City.
4. Karachi has available a large pool of urban labour, the risk of being unable to find a job is reduced for the firm locating in a large urban centre, and the risk of being unable to find labour on an as-needed basis is reduced for the firm.
[e] A great variety of indivisibilities in consumption and production -- sometimes referred to as scale economies and external economies -- make it attractive for both firms and households to settle in a major centre. A firm, for example, can obtain business services and other inputs at short notice when they are needed, without having to pay for them on a full-time basis. This is particularly important for small- and medium-sized firms.

[f] For a firm locating in a smaller centre, there is often the possibility that something that can be taken for granted in Karachi will not be available and that the firm will be put to the expense of making provision for unavailable items itself. A firm may be forced to become its own trucking operator, warehouser of office supplies, repairman, real estate manager, general store for its employees, and so on. This, of course, is the opposite of enjoying so-called "external economies" in a large city and may be termed the "diseconomy of forced internalization".

[g] Although delays in obtaining materials, water supply, power and other essential inputs are a problem everywhere, these delays are somewhat less severe in Karachi than in an outlying location. In some outlying areas there is great uncertainty as to whether power and water will be provided at all.

[h] Personal contacts are crucial in conducting business in Pakistan and the importance of being close to Government, clients, suppliers and colleagues can hardly be over-stressed. Karachi is obviously the only place in the Region where the extensive contacts essential for business can be maintained easily.

[i] The short-run cash-flow exposure of the agencies responsible for development is likely to be considerably less in Karachi than in any new major settlements that might be attempted outside the conurbation and Hyderabad. Entirely new development would require heavy outlays that could not at first be matched by the capacity of a new settlement to generate revenues.

[j] The personal preferences of owners, managers and technicians must be taken into account in choosing a location for a plant. For many people, a location away from Karachi would mean a location away from friends and family, clubs, fashionable shops, a variety of cinemas, and a sense of being in an active environment.

[k] The City is an important centre of informal education. The in-migrant is exposed to lifestyles other than his own. The information available to him in printed matter and by word-of-mouth is vastly greater than in the village or small township. He can acquire new skills of varying degrees of complexity, perhaps beginning as an unskilled worker in construction. Even as apeon he may become aware of the rudiments of business organization. He has a greater chance of having access to television -- through friends of a communal installation in a park. He has access to innumerable cinemas, where previously there was one or none at all. The list of potential sources of learning that exist in a large centre such as Karachi but to a much lesser extent, if at all, in smaller centres, is almost endless. These learning opportunities are important from a social, as well as an individual, point of view.
...may find it much easier to enter into various activities in a large city such as Karachi where the costs of tradition are less severe.

Although some diseconomies such as congestion and crimes increase very large sizes, income levels, net regional income, value added by industrial workers, local government expenditures are not as severe. The available data suggest that productivity also increases with size.

Some parts of Karachi have considerable acreages of vacant land and infrastructure capacity (roads, water, trunks, sewers, in particular) that are vastly underused. The costs of supporting the next increment of population growth are therefore likely to be lower in the conurbation than elsewhere and the underutilized should be taken advantage of prior to, or at least parallel with, the opening up of new areas.

Outlying centres may have some advantages over the conurbation, but these are likely to be outweighed by the factors discussed above. Utility costs may be lower, preliminary estimates for the overall costs of alternative systems are that differences in capital costs may be of only 10 or 15 per cent. Land costs may be initially in outlying centres, but will tend to increase with city size increases. Wage rates may be lower in centres initially, but labour in those centres may earn more costly transportation costs available in Karachi and/or because additional training is necessary in an area where rural labour is being brought into urban areas. Moreover, the likelihood of wages in towns is significantly lower than for very long. Control over labour may be easier in a smaller centre, but the labourers for a result of this. The assumption that the location of industry into outlying areas will produce benefits for local populations may be illusory; very industries import their labour from outside and existence of a new wage-earning population may increase for (and therefore the price of) everyday commodities.

Inter-area and inter-provincial equity is, and should be a major concern. Because of this, some development in other parts of the Region can be expected to take place in Urban Chauri. In the rest of the Region outside the Chauri/Gharo conurbation, however, there are at least some who would not seem to make sense to try to equity by attempting to create major centres. First, the agricultural and related activity to serve the conurbation will itself bring development into other parts of the Region. Second, from a national point of view, decentralization in other parts that are more productive than the rest of the Karachi area is likely to make much more sense than decentralization on a large scale within the Region.
297. The settlement structure proposed is summarized in Table V.4.

Table V.4
Regional settlement 1974-1985

<table>
<thead>
<tr>
<th>Population (thousands)</th>
<th>1974</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karachi Metropolitan Area</td>
<td>4,178</td>
<td>6,858</td>
</tr>
<tr>
<td>Thatta</td>
<td>22</td>
<td>42</td>
</tr>
<tr>
<td>Other non-agricultural population</td>
<td>68</td>
<td>110</td>
</tr>
<tr>
<td>Agricultural population</td>
<td>180</td>
<td>307</td>
</tr>
<tr>
<td><strong>Total regional population</strong></td>
<td><strong>6,448</strong></td>
<td><strong>7,317</strong></td>
</tr>
<tr>
<td>Hyderabad (outside the statistical region)</td>
<td>800</td>
<td>2,000</td>
</tr>
</tbody>
</table>


298. The Karachi Metropolitan Area will be far more extensive than the present built-up area. Its span from west to east will be approximately two and a half times that of the Karachi of today (or roughly half the distance between Karachi and Hyderabad). It will extend westward along the shoreline of the Arabian Sea towards Hawkes Bay. A new urban settlement will emerge in Hab Chauki, at first separated from the rest of the urban area but later (after the year 2000) becoming connected fully with it via expansion that will have occurred beyond Baldia. The Metropolitan Area will extend further to the northeast and to the east, in the latter case because of the industrial and urban growth associated with the new Steel Mill at Pipri and, to a lesser extent, additional industrial growth at Dahabeji/Gharo. Areas that are already partially built-up would be intensified -- in some cases (for example, Korangi), very substantially.

299. New industries will include steel manufacturing, machinery and other industries likely to be associated with steel, and petrochemicals. The transport terminal functions of the Metropolitan Area will expand considerably as a result of port expansion and the continued development of rail and airport facilities. It will continue to be the Region’s major centre for wholesaling, finance, business services, specialized regional consumer services, specialized institutional functions and urban recreation and tourism.

300. Hyderabad is expected to develop from its present population of approximately 800,000 to approximately 2 million by 1985. The Hyderabad-Kotri complex will have a fairly high proportion of its employment in manufacturing, reflecting the base that has been established already and new manufacturing opportunities that are likely to develop there. It will also have a substantial share of its employment in services, reflecting its traditional role as an administrative, institutional and service centre for the extensive hinterland that includes Nawabshah, Mirpur Khas and Thatta.

301. Thatta, growing somewhat faster than it has in recent years, will continue to play an important role as an administrative and agricultural service centre.
Thatta's growth will have to be promoted actively. Thatta can serve effectively as a collection and price point for agricultural produce in the future to be seen. It may be that trucking from smaller areas such as Sajawal directly into Karachi or other main urban areas will result in its being by-passed as a marketing point. Thatta will continue to be an administrative headquarter and will become increasingly attractive as a centre, taking advantage of monuments such as the Makli Burjhan's Mosque.

Because Thatta's growth will be modest, it could be a location for experimenting with simple forms of housing that may be appropriate later for larger applications elsewhere in the Region. Water for Thatta is to be provided from groundwater up to 1985. It has a normal complement of police, fire and other services. Education and health services should be substantially improved. Thatta could become the principal education and agricultural research centre for the rest of the delta.

Outside these three major settlements, development will be predominantly agricultural with the non-farm population concentrated in agro-villes or markazes in support of the farming population.

Within the Project Water Husbandry Area to be described in Chapter VII, which describes the proposed water husbandry programme, approximately 472,000 acres of Class 2 soils might eventually be brought into cultivation with perennial irrigation. Approximately 210,000 of this might be in three crops, the remainder being double-cropped. Up to 1985, approximately 82,000 acres of this area might be brought into cultivation with double-cropping, that is, having perennial irrigation in the CM barrage Command and 37 per cent of cultivable area within the proposed husbandry area.

This increase in agricultural acreage would be achieved by large-scale improvements in groundwater management by integrating urban and rural development in the Karachi area, using urban waste water, in conjunction with water, for irrigation. Outside the Karachi Urban Area, increase in agricultural acreage would be achieved primarily by improved groundwater management and surface water improvement, since there would be no large urban centres whose water could be used for irrigation.

All of the irrigated agricultural acreage would be fruit, vegetables, milk and fodder. Fruit and vegetables would be produced as close as possible to the urban markets in the Karachi Metropolitan Area. It would be possible eventually to produce in the Region all of the fruit and vegetables and a large percentage (perhaps 70 per cent) of the meat necessary to serve the entire regional population.
310. Because good soils are so scarce they would be used only for fruit, vegetables, and fodder. Destructive grazing would be avoided but improved range management, with controlled grazing outside the intensively cultivated fodder acreage, could be developed gradually if and when ground-cover is re-established as a result of overall improvements in groundwater management. Farmyards would be kept off the good soils as fully as possible and placed around the edges of cropped areas in linear settlements at moderately high densities. Each farm unit would consist of farm housing, farm facilities, the dairy and/or meat herds upon which it is based and highly localized small-scale retailing of the type that today operates in partly-converted houses or hawkers' cabins. Most rural retailing and other commercial activity would be concentrated in agricultural service centres.

311. Agricultural areas would be served by three types of semi-urban centres, with populations in those centres ranging from perhaps 5,000 to 20,000, depending upon their functions and their locations relative to agricultural areas and major transport facilities. Command centres, at the heads of command areas would contain the functions necessary to regulate groundwater and control pumping for irrigation.

312. Collection and distribution centres, generally at the lower ends of command areas, would include major marketing services and, in some cases, agro-industry. These collection and distribution centres would, in some instances, function as centres for groundwater regulation where they are between two agricultural areas, as in the case of Kalu Kuhar and Junghahi, where the lower area would reuse water from the upper area. General purpose agricultural service centres would be suitably spaced along the edges of agricultural areas, within the farm settlements. Some of the service centres in the Region would incorporate the full range of functions proposed for markazes and agrovilles in the Government's new agricultural development programme.

313. In addition to the three major urban settlements (including Hyderabad) and agricultural settlement there would be small special-purpose centres developed in conjunction with the utilization of mineral resources, tourism and regional recreation and defence installations.

314. Strategic areas on the coast and around existing and proposed lakes and reservoirs should be reserved immediately for long-term regional recreation and tourism. These locations include Sonniani, Gadani, Cape Monze, Hawkes Bay, Clifton, the Korangi Creek-Pipri Estuary, Nab Dam, Khadeji Falls, Kalri Lake and areas around the new surface reservoirs that would be created as part of the overall water resources management programme. Facilities exist at, or are proposed for, several of these sites including Gadani, Hawkes Bay, Clifton and Kalri Lake.

315. The Region's beaches, lakes, estuary areas, historic sites and urban entertainment, if promoted properly, could grow greatly in importance for domestic tourism and eventually perhaps, even for foreign tourism. Karachi is approximately
mours from Europe on the way to Japan and other points east. It is possible to imagine businessmen being tempted to break their journeys, in either direction, for an overnight stay or a weekend of deep-sea fishing, year-round swimming, desert horse-riding and urban evening entertainment. Both recreation and tourism could be important labour-intensive activities and, to at least a limited extent, raise exchange earners and will be discussed in Chapter XVI.

The settlement pattern proposed is summarized in the Regional Land Use 1963.
To make possible this regional development, a series of critical additions to regional infrastructure must be achieved. These include the completion of the hab-dam and bulk water supply canal connecting it with Karachi, several new water treatment plants, a protective drainage plan, and other flood control works to the north of the metropolitan area, port expansion at Karachi Port and the location of new port facilities at Sunder Qasim, improvements to the existing Karachi civil airport, a new railway marshalling yard at Pilaf and rail and road links to the new Steel Mill and Sudder Qasim port site, several new power stations and two high-tension power transmission lines from the Kotri-Sukkurabad area into Karachi, a second gas transmission line into Karachi from Sui, and a series of groundwater management projects to support agricultural development. These projects are shown in the map Critical Additions to Regional Infrastructure 1974-1985. They are described later, in the sections which deal with the individual sector programmes.
After 1985 at least two alternatives for regional development deserve serious consideration.

The first is a continuation of the consolidated regional settlement pattern recommended for the period 1974-1985, with most of the Region’s urban development focused in and around Karachi and, just beyond the Region, in Hyderabad. A pursuit of this strategy would reflect a continued concern with the emphasis on productivity and low risk that led to its selection for the period up to 1985. By the year 2000 it might have associated with it a population of the order of 12,600,000 in the Karachi Metropolitan Area, 3,000,000 in Hyderabad and perhaps 100,000 in Thatta. Smaller semi-urban settlements in the Region, primarily agricultural service centres and the special-purpose settlements referred to earlier might range in size from 5,000 to 50,000. The total farm population and agricultural service centre population might be of the order of 1,600,000, bringing the total regional population, excluding Hyderabad, to something of the order of 16,000,000.

Additional agricultural acreage would be brought into production as groundwater management improved, bringing the total agricultural acreage in the proposed Water Husbandry Area north of National Highway No.1 up to approximately 364,000 acres.

If the urban waste water regeneration system proposed proves to be feasible the Region, including the Metropolitan Area, will be able to achieve an adequate supply of water up to the year 2000. The semi-desert hinterland of Karachi would, literally, begin to bloom. If the regeneration proposal proves to be unfeasible, major improvements and additions in the Karachi Metropolitan Area would continue, with the basic strategy unchanged, but preparation would have to be made to increase the volume of water to be brought in from the Indus above the 280 MGD now planned.

A second possible strategy for the Region was examined at some length during the Second Cycle of the Karachi Planning Project. It was rejected for the period 1974-1985 because of the concern with low initial capital costs and risk but it deserves re-consideration for the period 1985-2000 when the resource position, implementing capacity and objectives for that period become clearer. This second alternative would disperse the Region’s urban population more widely than the consolidated regional settlement alternative just described. It would locate a large part of the Region’s total urban population (between 2,650,000 and 3,650,000 of a total urban population of 12,600,000 in the year 2000) in two major urban centres and three townships outside the Karachi Urban Area. It would make it possible to bring into intensive agricultural use approximately 87 per cent (472,000 acres) of the 542,000 acres of Class A and B soils in the Water Husbandry Area north of National Highway No.1. If the 454,400 acres said to be irrigable in the Ghulam Mohammed Barrage Plan could be brought into irrigated cultivation also, this means that approximately 81 per cent of the Region’s potentially irrigable soil in these two areas could be utilized. Like the Consolidated Regional Settlement (CRS) alternative, the
Dispersed Regional Settlement (DRS) strategy would be responsive to all of the basic development objectives identified in Chapter IV and the specific sectoral objectives identified in Part III. Its adoption would reflect a shift in emphasis — reducing the concern with low initial capital cost and risk and giving increased priority to keeping the population load on Karachi as low as possible, increased opportunities for improvements in food consumption, increased recreational opportunities and environmental amenity.

323. In the Dispersed Regional Settlement alternative the total population of the Region would increase from the estimated level of 4,448,000 in mid-1974 to approximately 14,750,000 in the year 2000. The order of magnitude of the urban settlement pattern proposed in the DRS, together with the projected population for the Hyderabad Urban Area is summarized in Table V.5.

Table V.5

<table>
<thead>
<tr>
<th>Karachi Region: major urban centres, 2000, with Dispersed Regional Settlement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban population (thousands)</td>
</tr>
<tr>
<td>Karachi Urban Area</td>
</tr>
<tr>
<td>Kalu Kuhar</td>
</tr>
<tr>
<td>Baran</td>
</tr>
<tr>
<td>Thatta</td>
</tr>
<tr>
<td>Jungshahi</td>
</tr>
<tr>
<td>Jhimpir</td>
</tr>
<tr>
<td><strong>Total Region</strong></td>
</tr>
<tr>
<td><strong>Hyderabad (not in the statistical Region)</strong></td>
</tr>
</tbody>
</table>

Source: Karachi Planning Project estimates.

324. The Karachi Urban Area would continue to be dominant, but the DRS alternative presumes that aggressive public leadership would succeed in redirecting a substantial part of all urban growth to other areas. Urban development outside the Karachi Urban Area would be accelerated as fully as possible in an effort to create centres that would be large enough and varied enough in their functions to attract urban settlers who would otherwise be in Karachi. In the case of Kalu Kuhar, specifically, growth would be accelerated to make it possible to open up as quickly as possible the agricultural area that could be served by the waste water re-generated by the new city.

325. Kalu Kuhar is the location at which the largest urban population could be settled to support agriculture. A population level of at least 1,500,000 would be needed to maintain a stable water supply for irrigation in the Kalu Kuhar Command Area. Even with such a population level the area that could be brought into cultivation in the vicinity of Kalu Kuhar would be considerably smaller than the acreage of good soils available. But this population level is not the only variable affecting the likelihood of its achievement. At least as important would be the willingness of
firms to locate in what would be a risky location, at least in the short run, and the capacity of Government to promote the development of a major new city and provide the infrastructure necessary to achieve the high rates of growth projected. For a population of the order of 1,500,000 a 70-MGD conduit would be taken to Kalu Kuhar from Kalri Lake. At present, it is proposed that this 70 MGD will be brought to Karachi under Phase IV of the Greater Karachi Bulk Water Scheme, through a conduit that is already in place from Kalri Lake as far as Pipri. The diversion to Kalu Kuhar would mean the abandoning of the Phase IV proposal.

326. Baran, like Kalu Kuhar, would have a relatively high proportion of all its employment in manufacturing and construction in its early growth. It would also be a major agricultural service centre, with agro-industry. Government itself would have to stimulate the development of the centre, as with the other new centres, by locating as much governmental employment as possible in Baran — in agricultural and industrial promotion agencies, in nationalized industries, in general administration and, of course, in essential social services. Local transport would utilize a modern bus fleet. The city would also be provided with express bus connections to Karachi and Hyderabad.

327. Thatta would have essentially the same function as in the CRS alternative but would be somewhat larger.

328. Jungshahi and Jhimpir both would be important agricultural service centres with a limited amount of large-scale manufacturing, though the share of large-scale manufacturing in all employment would be relatively high because of the small employment base. Fishing, retail trade and services may have larger shares of employment in Jhimpir than in Jungshahi because Jhimpir is closer to Kalri Lake and may have fishing industry and recreational service functions that would not occur in Jungshahi. Jungshahi, on the other hand, may have a larger share of its employment in manufacturing because of the possibility of re-establishing glass manufacturing and other mineral-based industry there. Both would be agricultural service centres. Both would be modest in size, reaching 150,000-200,000 persons by the year 2000, no larger than the combined populations of Nazimabad and Taimuria in 1969/1970.

329. Hyderabad's development would be essentially as described for the CRS.

330. In addition to the principal urban settlements there would be special-purpose centres developed in conjunction with the utilization of mineral resources, with defence installations and for tourism and regional recreation, as in the CRS.

331. The DRS alternative would bring into cultivation, within the Project Water Husbandry Area proposed, approximately 872,000 acres of Class A and Class B soils with perennial irrigation. Approximately 395,000 acres of this would be in three crops, the remainder being double cropped. This total acreage in agricultural development, considerably more than in the CRS, would have associated with it a system of agricultural service centres similar in kind but larger in number than in the CRS.
The DRS would incorporate the fullest possible re-use of urban waste water for agriculture.

In the year 2000, for the Water Husbandry Area north of Highway No. 1 the total water demand would be nearly 1,885 MGD, approximately 53 per cent of which would be for agricultural demand. The total water available would be approximately 1,958 MGD made up of 280 MGD from the Indus, 70 MGD from the Hub Dam, 465 MGD from groundwater, 553 MGD from re-useable urban waste water and 51 MGD re-useable after agricultural use; approximately 14.751,000 in the year 2000 need be no greater than 280 MGD already planned.

Standards in individual urban settlements would vary, with overall supply and consumption would be 52-70 gpcd, respectively; consumption for residences could range between 27 and 37 gpcd. This means the water regeneration system proposed were fully utilized, the total draw-off from the Indus to support a population of 14.751,000 in the year 2000 need be no greater than 280 MGD already planned.

The additional regional infrastructure required to make the DRS, relative to the CRS, would include the 70 km canal to Kalu Ruhar, an additional rail link to Ruhar and additional inter-city road, power and water installations.


**E. BEYOND THE YEAR 2000**

It is appropriate to look briefly at what might happen after the turn of the century because preliminary scoping of long-range possibilities may help to establish objectives for the first 25 years.

By the year 2050 Pakistan's total population may reach a high-standard, low-growth-rate level somewhere between 180 million and 230 million. The urban populations of the Sukmiani-Karachi-Hyderabad area may well be of the order of 70 to 100 million, four to six times the estimated present level of 5 million (including Hyderabad), and so a conservative forecast since it assumes that the rate of natural increase will have slowed down to an average compound rate of less than 0.5 per cent. The non-urban growth of the region may be below the upper level of 2 million presently forecast for 2000 (with the Regional Settlement alternative) because of increased productivity in agriculture, "rural" households engaged in many urban occupations, as is the case in Karachi. A very speculative tabulation of possible population levels is presented in Table V.6 using mid-range forecasts.
Table V.6
Speculative projection of national and regional population to 2050/

<table>
<thead>
<tr>
<th></th>
<th>1974 (estimate)</th>
<th>2000 (medium growth rate)</th>
<th>2050 (medium growth rate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pakistan population</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>66,800,000</td>
<td>120,000,000</td>
<td>205,000,000</td>
</tr>
<tr>
<td>Average annual compound</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>growth rate 2040-2050:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pakistan urban population</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20,300,000</td>
<td>59,800,000</td>
<td>160,000,000</td>
</tr>
<tr>
<td>Average annual compound</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>growth rate 2040-2050:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5%-1.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of Pakistan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>population</td>
<td>30.3%</td>
<td>46%</td>
<td>78%</td>
</tr>
<tr>
<td>Sommiani-Karachi-Hyderabad urban population</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5,000,000</td>
<td>15,600,000</td>
<td>25,000,000</td>
</tr>
<tr>
<td>Average annual compound</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>growth rate 2040-2050:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.1%-0.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of Pakistan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>population</td>
<td>7.5%</td>
<td>12.0%</td>
<td>12.2%</td>
</tr>
<tr>
<td>Percentage of Pakistan</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>urban population</td>
<td>24.6%</td>
<td>26%</td>
<td>35.6%</td>
</tr>
</tbody>
</table>

Note that the population of the Hyderabad urban area is assumed to be 800,000 in 1974; its average annual compound growth rate 1974-2000 is assumed to be approximately 5.2 per cent, bringing its population in 2000 to 3,000,000.

339. The continuing importance of imports and exports in Pakistan's economy, the continued development of major industries requiring coastal locations, an increasing dependence on nuclear power and increasing strains on total water resources all favour the growth of coastal conurbations -- pre-eminently, the Sommiani-Karachi-Hyderabad megalopolitan cell. These tendencies may be further reinforced if the desalination of seawater for urban uses becomes economically feasible.

340. The regional population is likely to have become highly literate as part of the economic-demographic transition that is forecast. Household size probably will have decreased, reflecting decreased birth rates, the almost complete elimination of domestic servants and a shift to nuclear family structure.

341. Extensive capital-intensive agriculture, using all of the region's cultivable areas, is likely to be playing an even more important role in regional development than
is already proposed for the year 2000 and agricultural and
forest areas may have helped to rehabilitate large parts
of the desert environment.

342. Agricultural areas and the service centres support-
ing them are likely to be served by a network of transport
and communication facilities providing high levels of acces-
sibility throughout the Region, such that non-urban and
urban life-styles will be becoming increasingly similar.

343. All sectors of the economy are likely to have become
more capital-intensive. The share of manufacturing in
employment is likely to have decreased, accompanied by con-
siderable increases in the shares of trade and services.

344. A very efficient use of the Region's water resources,
coupled with efficient waste management, may have been developed.
Assuming the feasibility of the water regeneration system
proposed, urban waste water will be re-used intensively for
agriculture and regenerated for urban purposes, since the
amounts that can be regenerated will be in excess of agri-
cultural requirements.

345. The Region may be relying heavily on nuclear gener-
ators for its electric power; their siting would affect
coastal land use markedly because of the protective zones
required.

346. The successful use of solar energy on a large scale
may have provided an alternative source of power. The climate
of the Karachi Region would seem to make it a likely candidate
for successful solar-energy applications.

347. The urban population is likely to have extended mas-
sively along the transport, communications and utility
arteries linking Karachi and Hyderabad, particularly on the
northern side of the Karachi-Hyderabad corridor, where urban
wastes can be used most effectively to support agriculture
or to recharge groundwater reservoirs and where the problem
of disposing of urban waste water is therefore less severe
than it is south of Shabeji/Gharo and Thatta. The urban
agglomeration between Karachi and Hyderabad may have assumed
the form of a massive multiplex-corridor megalopolis, with
major west-east corridors along the alignments of the Super-
highway, the railroad and National Highway No. 1, linked by
north-south corridors in strategic locations.

348. Substantial urban growth is likely to have taken
place west of Karachi, in Baluchistan, linked with agri-
cultural development in the Hub Valley. This westward
extension would be encouraged also by the attractiveness
of the coastal areas between Cape Monze and Sonmiani.
Urban concentrations linked more tenuously with the main
development may have been established in areas of high
environmental quality associated with intensive agriculture
near the Hub Dam, at Thano Ahmed Khan and at Thano Arab,
for example, in addition to the growth proposed for Baran
City in one of the two alternatives suggested for the period

349. There is likely to have been a many-fold increase
in the area occupied by high-density high-standard develop-
ment in the major core cities. Recreation and tourist
complexes offering sophisticated entertainment, swimming,
deep-sea fishing, shooting, boating, horse-back riding and
crusions to historic sites are likely to have been estab-
lished at Somniani, Gadani, Cape Monze, on the Hawkes Bay
shore, at Clifton, in the Korangi Creek-Charo Creek estuary
and possibly in other areas. Domestic tourism and regional
recreation will have increased the importance of such areas
and the Region will have come increasingly into the ambit
of world tourism.

350. The megalopolis extending through Karachi to and
beyond Hyderabad may be served by very high-capacity, high-
speed, public ground transport, intra-area VTOL or other
short-range air transport services and sophisticated audio-
visual communication systems. There may be another major
rail connection between Karachi and Hyderabad, possibly
along an alignment in the vicinity of the Superhighway, and
there may be one or more north-south rail links connecting
major industrial centres. At least one additional inter-
national airport is likely to have been developed, together
with intra-area airports and heliports. Port facilities
are likely to have been expanded considerably, including
development in the Bundal Island-Kiprianwalla area.

351. One possible version of the long-range regional
growth that is foreseeable is shown in the diagram Long-
Range Regional Growth Beyond 2000.

352. If these speculations are at all indicative of the
prospects for the Region they suggest that the choice to
be made for 1985-2000 between the Dispersed Regional Settle-
ment alternative and the Consolidated Regional Settlement
alternative is primarily a choice that has to do with the
timing of development. The DRS and the CRS both are likely
to be part of the long-run future — that is to say, the
population envisioned for the Karachi Urban Area in the CRS
is likely to be combined with the dispersed settlement of the
DRS eventually. The two alternatives are not mutually
exclusive. This in no way diminishes the importance of the
choice, for the implications of each alternative will depend
greatly upon its timing. In particular, the timing of
development will affect the productivity of the investment
required and the risks associated with that investment.
Chapter VI

Metropolitan Growth

A. POPULATION, INCOME AND EXPENDITURES

The population of the Karachi District in 1941 was approximately 430,000. In only 10 years it had increased to approximately 1,130,000, chiefly as a result of the influx of displaced persons from India, beginning with the creation of Pakistan in 1947. It is estimated that the population of the Karachi Metropolitan Area will have reached approximately 4.16 million by 1974. Since 1961 the growth that was accelerated by the immigration from partition has slowed down to a more 'normal' growth rate attributable to natural increase and continuing immigration from small urban centres and rural areas elsewhere in Pakistan. The growth rate of 5.3 per cent between 1961 and 1974 is not unusual for a metropolis in a developing economy. The population growth of Karachi for the period 1941-1974 is shown in Table VI.1.

Table VI.1

Karachi Metropolitan Area:
Population growth 1941-1974

<table>
<thead>
<tr>
<th>Year</th>
<th>Population in millions</th>
<th>Average annual compound growth rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1941½</td>
<td>0.43</td>
<td>-</td>
</tr>
<tr>
<td>1951½</td>
<td>1.13</td>
<td>6.6</td>
</tr>
<tr>
<td>1961½</td>
<td>2.14</td>
<td>6.6</td>
</tr>
<tr>
<td>1974½</td>
<td>4.16</td>
<td>5.3</td>
</tr>
</tbody>
</table>

Note: Adjusted census figure; unadjusted figure for 1961 was one million.
National Pilot Project No.3 estimate.
The population growth expected in the Metropolitan Area in the period 1974-1985 is shown in Table VI.2. The 1985 midpoint urban population forecast of 6.9 million is the working estimate used for Plan calculations. It falls within the feasible and desirable population range identified in Chapter V and is associated with a growth rate of 4.5 per cent for national GDP up to 1985. More tentative projections to the year 2000 indicate a metropolitan population in the vicinity of 12.5 million, if the consolidated regional settlement pattern described in Chapter V is adopted. Although their estimates may seem high, it should be noted that they presume a decrease in the average annual compound growth rate of population from 5.3 per cent for 1961-1974 to 4.7 per cent for 1974-1985 and 4.0 per cent for 1985-2000.

Table VI.2

<table>
<thead>
<tr>
<th>Year</th>
<th>Population in millions</th>
<th>Average annual compound growth rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>4.16</td>
<td>5.3⁴/</td>
</tr>
<tr>
<td>1980</td>
<td>5.32</td>
<td>4.7</td>
</tr>
<tr>
<td>1985</td>
<td>6.84</td>
<td>4.7</td>
</tr>
<tr>
<td>2000</td>
<td>12.38</td>
<td>4.0</td>
</tr>
</tbody>
</table>

⁴/ Growth rate 1961-1974

Immigration has produced a metropolitan population which is ethnically and linguistically heterogeneous. According to the 1961 census, migrants from India constitute the largest ethnic group (42.6 per cent of the population were born in India; if the children born in Karachi to persons born in India were included, the proportion would be considerably higher).

1. Age and sex structure

The projected age and sex structure of the metropolitan population for 1985 is shown in Table VI.3. These projections are based on cohort-survival projections using adjusted 1961 census population data as a base. For the base 1961, age-specific fertility rates calculated by PIDE in 1959 were used.⁴/ The immigrant population was distributed over the

and female age groups according to sex- and age-specific rates which were calculated by PIDE in 1959. It indicates that there will be an increase of 377,000 primary school age group (five to nine) in the period 1974-1985 and 264,000 in the secondary school (10 to 14). The implications of this for school requirements will be taken up in Chapter XX. Assuming a force participation ratio of approximately .32, the labour force in the 11-year period will be approximately 892,000.

2. Household size

Data on household size, related to household income, are in Table VI.4. The data available suggest that a positive correlation between income and household size may account for this. Lower-income families may accommodate more persons per household. The economic capacity limit of income households to support extended and joint families is lower than that of upper-income households. High-income households undoubtedly have larger numbers of servants per household.

Table VI.3

Karachi Metropolitan Area: Population by age and sex, 1974-1985 (thousands)

<table>
<thead>
<tr>
<th></th>
<th>1974</th>
<th></th>
<th>1985</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Male</td>
<td>Female</td>
<td>Total</td>
</tr>
<tr>
<td>Males</td>
<td>637</td>
<td>332</td>
<td>305</td>
<td>986</td>
</tr>
<tr>
<td>Females</td>
<td>500</td>
<td>265</td>
<td>235</td>
<td>824</td>
</tr>
<tr>
<td></td>
<td>475</td>
<td>258</td>
<td>217</td>
<td>728</td>
</tr>
<tr>
<td></td>
<td>416</td>
<td>220</td>
<td>196</td>
<td>640</td>
</tr>
<tr>
<td></td>
<td>383</td>
<td>208</td>
<td>175</td>
<td>596</td>
</tr>
<tr>
<td></td>
<td>316</td>
<td>183</td>
<td>133</td>
<td>583</td>
</tr>
<tr>
<td></td>
<td>323</td>
<td>199</td>
<td>130</td>
<td>535</td>
</tr>
<tr>
<td></td>
<td>292</td>
<td>174</td>
<td>118</td>
<td>488</td>
</tr>
<tr>
<td></td>
<td>225</td>
<td>138</td>
<td>87</td>
<td>356</td>
</tr>
<tr>
<td></td>
<td>171</td>
<td>110</td>
<td>61</td>
<td>286</td>
</tr>
<tr>
<td></td>
<td>138</td>
<td>87</td>
<td>51</td>
<td>161</td>
</tr>
<tr>
<td></td>
<td>104</td>
<td>64</td>
<td>40</td>
<td>199</td>
</tr>
<tr>
<td></td>
<td>175</td>
<td>98</td>
<td>77</td>
<td>309</td>
</tr>
</tbody>
</table>

Total 1,613 2,338 1,823 6,839 3,876 2,964

Source: National Pilot Project No. 1 estimates; all figures rounded to the nearest thousand.
358. The projections shown in Table VI.4 presume a slight decrease in household size by 1985 in the income groups up to PRs.999 per month, reflecting the assumed impact of population planning programmes, an increase in the share of single-person and small-family immigrant households in the lowest-income groups and the impact of the Development Plan housing programme, which is focused on the lower-income groups and should relieve pressures for doubling up.

359. Household size in the income groups PRs.1,000 per month and above is assumed not to change significantly by 1985. It is assumed that they will have a continued preference for extended and joint-family living, at least up to 1985, and will maintain domestic servants. Moreover, the proposed housing programme, focusing on the lower-income groups, would not tend to relieve pressures for doubling up or extended family living (which may be the result of housing space constraints as well as behavioural preferences) for the upper-income groups. Average household size would decrease slightly by 1985, but the figure of 5.75 persons per household has been used for the entire 1974-1985 period to simplify computations.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 300</td>
<td>4.58</td>
<td>4.51</td>
<td>4.18</td>
<td>3.93</td>
</tr>
<tr>
<td>300-499</td>
<td>6.44</td>
<td>6.34</td>
<td>6.04</td>
<td>5.81</td>
</tr>
<tr>
<td>500-999</td>
<td>7.53</td>
<td>7.39</td>
<td>7.07</td>
<td>6.84</td>
</tr>
<tr>
<td>1,000-1,999</td>
<td>7.23</td>
<td>7.23</td>
<td>7.23</td>
<td>7.23</td>
</tr>
<tr>
<td>2,000 and more</td>
<td>7.93</td>
<td>7.93</td>
<td>7.93</td>
<td>7.93</td>
</tr>
</tbody>
</table>

360. The present inequities in urban household income are immediately apparent from the data in Table VI.5. It is estimated that in 1974 approximately 45 per cent of the Metropolitan Area’s households have incomes of PRs.300 a month or less and almost 80 per cent have monthly incomes of only PRs.500 or less.

361. The projections indicate that even by 1984/1985 there will still be approximately 65 per cent of all households in the PRs.0-499 per month group. The implications for households’ limited ability to obtain better housing and pay for even minimal services necessary for an adequate standard of living are fairly obvious. However, the increase forecast for the percentage of households in the PRs.500-999 group and the decrease in the PRs.0-299 group suggest that conditions can be gradually improved.
Table VI.5
Karachi Metropolitan Area: Household income distribution, 1974-1985

<table>
<thead>
<tr>
<th>Income groups (PA),</th>
<th>Percentage of households</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 300</td>
<td>44.52</td>
</tr>
<tr>
<td>300-499</td>
<td>35.35</td>
</tr>
<tr>
<td>500-999</td>
<td>14.42</td>
</tr>
<tr>
<td>1000-1999</td>
<td>3.43</td>
</tr>
<tr>
<td>2000 and more</td>
<td>2.28</td>
</tr>
</tbody>
</table>

362. Projections for growth rates within individual income groups were based on an analysis of trends from 1959 to 1970 and judgments concerning the impact of the Distributive Investment Plan development strategy. Data from the PIDE survey in 1959 and the Socio-Economic Survey in 1970 in Karachi indicate that between 1959 and 1970 the annual growth rates of household income in each income group were almost the same; however, it has been assumed that for the future the Distributive Investment Plan strategy will result in higher rates of growth of household income for lower-income groups than those for higher-income groups.

363. Although household incomes in the Metropolitan Area are above those in the rest of Pakistan, costs are also higher, and most Karachi households are unable to provide themselves with an adequate standard of living. Estimates of household consumption expenditure are presented in Table VI.6. These were prepared from data on household expenditures by income groups for all urban areas of West Pakistan. Household expenditure patterns in Karachi may deviate slightly from these due to different behavioral patterns and supply conditions.

364. Of particular importance for the Development Plan are:

a) The large proportion of total expenditures allocated to food and drinks by all income groups. Expenditures on food and drinks by low-income groups approach 60 per cent of all expenditures. This underscores the desirability of maintaining an adequate supply of food at prices that can be afforded by low-income households.

b) The relatively low level of expenditures on transport, post, telegraph and telephone and the relatively high level of expenditure on these items by low-income groups and high-income groups respectively. This indicates the stress that may be placed upon a low-income household's budget if it is forced to pay high transport costs. It also indicates that a great deal of value is placed on mobility and communications, if the household can afford them.

The relatively low levels of expenditure on medical care, reflecting the inability of all except the highest-income groups to afford services. This underlines the importance of the strategy proposed for health in Chapter XXI.

The low levels of expenditure on education for groups below Rs. 500 per month, and the relatively high levels of expenditure for groups above Rs. 500 per month. This is indicative of the disadvantage at which low-income groups find themselves as they attempt to provide education for themselves and their children. It underscores the desirability of the literacy training, primary education services and informal education through mass media proposed in Chapter XX.

The implications for the Metropolitan Area's commercial structure. Very large differences in the City's commercial centres can be expected as a result of differences in the composition of household expenditures in the market areas of individual centres.

The implications for basic nutrition. To obtain an idea of the level of consumption of major food items achievable with current levels of expenditure, detailed household expenditure figures for major food items 
were linked with estimated prices in Karachi 
, to obtain estimates of physical consumption by income group. Estimates of caloric intake and protein intake per pound were obtained from the Lower Indus Report and were multiplied by the estimated physical consumption of major food items by income group to obtain estimates of caloric and protein intake by income group.

The Lower Indus Report accepts an average daily intake of 2,050 calories as sufficient because body weights in Pakistan are lower than those assumed in the development of FAO international standards. Even at these relatively low standards, only groups with incomes of Rs. 1,000 per month and over have a sufficient caloric intake.

The daily intakes of vegetables, meats and milk have higher income elasticities than most other food items. These items are relatively costly to transport to Karachi and are subject to damage and spoilage while being transported. As the population of Karachi increases and as per capita incomes rise, demand for these items will increase rapidly. It is desirable to establish a greater level of agricultural production in the Region to help reduce food prices in Karachi and to increase the supply of these food items. Proposals for this are presented in Chapter IX.

The consumption patterns of households at each income level over the next 11 years are expected to be similar to present patterns but the projected shift in income distribution will mean substantial changes in overall consumption patterns. Forecasts of future demand for food, water, sewerage, housing, transport and commercial facilities have been based on these estimates.

3/ Ibid.
4/ Government of Pakistan, National Pilot Project No.3, Master Plan for the Karachi Metropolitan Region. Project estimates.
One of the points that must be borne in mind is that sustained in-migration of single-person households from other parts of the nation results in a metropolitan population with sub-groups that have relatively little allegiance to the City. Their ties with their families and property in the villages from which they came remain strong. The meagre savings they accumulate are sent back to those villages, describing the Metropolitan Area of part of the household investment that would otherwise contribute to the creation and maintenance of the City. This is not necessarily bad, since one of the functions of Karachi is to generate funds for the improvement of other areas. However, the likely uses of savings should be recognized when establishing realistic expectations concerning the levels of investment that can be expected in metropolitan housing and other facilities.

Table VI.6

Karachi Metropolitan Area: Monthly consumption expenditures of households (rupees)

<table>
<thead>
<tr>
<th>Expenditure classification</th>
<th>Income per month per household</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-399</td>
</tr>
<tr>
<td>Food and drinks</td>
<td>127.1</td>
</tr>
<tr>
<td>Cloth, clothing and shoes</td>
<td>21.4</td>
</tr>
<tr>
<td>Household and personal effects except durables</td>
<td>1.5</td>
</tr>
<tr>
<td>Appliances, furniture, motor vehicles and other durables</td>
<td>2.0</td>
</tr>
<tr>
<td>Housing and utilities</td>
<td>31.0</td>
</tr>
<tr>
<td>Transport, post, telegraph, telephone, except durables</td>
<td>8.1</td>
</tr>
<tr>
<td>Laundry and personal care</td>
<td>9.2</td>
</tr>
<tr>
<td>Medical care</td>
<td>6.0</td>
</tr>
<tr>
<td>Education</td>
<td>2.7</td>
</tr>
<tr>
<td>Recreation and reading except durables</td>
<td>1.4</td>
</tr>
<tr>
<td>Domestic services and other</td>
<td>14.5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>219.9</td>
</tr>
</tbody>
</table>

Source: Government of Pakistan, Central Statistical Office, report on the Quarterly Survey of Current Economic Conditions in Pakistan (Household Income and Expenditure) (July 1966 to
I. The existing metropolitan economy

369. The City's economic activities are tremendously varied, a mix of the traditional and the modern. Large-scale manufacturing is carried out in major industrial complexes using sophisticated technologies while artisans are still producing such things as copper and brassware, glass and pottery using traditional techniques often in the centre of the City. A rough estimate suggests that perhaps 35 per cent of all employment is in modern sub-sectors while 65 per cent remains traditional.

370. The structure of the metropolitan economy for the period 1974-1985 showing the shares of each major sector in output and employment is summarized in Tables VI.7 and VI.8.

371. Non-agricultural output is expected to grow at an average annual rate of 7.1 per cent for the period 1974-1985. This will result in an increase in per capita output from Rs.1,720 in 1974 to Rs.2,220 in 1985.

Table VI.7

<table>
<thead>
<tr>
<th>Item</th>
<th>Average annual growth (per cent)</th>
<th>Non-agricultural output</th>
<th>Share of non-agricultural output (per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing and mining</td>
<td>7.2</td>
<td>234</td>
<td>353</td>
</tr>
<tr>
<td>a) large-scale</td>
<td>7.1</td>
<td>29</td>
<td>44</td>
</tr>
<tr>
<td>b) small-scale</td>
<td>8.5</td>
<td>78</td>
<td>126</td>
</tr>
<tr>
<td>Construction</td>
<td>10.2</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td>Public utilities</td>
<td>6.6</td>
<td>115</td>
<td>169</td>
</tr>
<tr>
<td>Trade</td>
<td>7.5</td>
<td>45</td>
<td>69</td>
</tr>
<tr>
<td>Banking and insurance</td>
<td>7.0</td>
<td>25</td>
<td>37</td>
</tr>
<tr>
<td>Ownership of dwellings</td>
<td>6.8</td>
<td>89</td>
<td>132</td>
</tr>
<tr>
<td>Transportation</td>
<td>6.2</td>
<td>93</td>
<td>134</td>
</tr>
<tr>
<td>Services</td>
<td>7.1</td>
<td>722</td>
<td>1,089</td>
</tr>
</tbody>
</table>

Note: Totals may not equal sum of items due to rounding.

372. The most significant contributors to output and employment are large-scale manufacturing (approximately 32 per cent of output and 16 per cent of employment), trade (approximately 16 per cent of output and 17 per cent of employment), services (11 per cent of output and 36 per cent of employment), transportation (12 per cent of output and 10 per cent of
employment), construction (11 per cent of output and 8 per cent of employment) and small-scale manufacturing (about 4 per cent of output and 12 per cent of employment). The differences in the shares of these sectors in output and their shares in employment reflect, in general, their capital intensiveness.

373. It should be noted that although large-scale manufacturing is a major contributor to output, it presently accounts for only about 16 per cent of employment. Large-scale manufacturing should not be relied on excessively to achieve the better balance between job opportunities and places of residence that is of concern in the physical growth strategy for the Metropolitan Area. Service activities, trade and small-scale manufacturing must also contribute importantly to that balance.

Table VI.8
Karachi Metropolitan Area: Non-agricultural employment 1974-1985

<table>
<thead>
<tr>
<th>Item</th>
<th>Average annual growth (per cent)</th>
<th>Non-agricultural employment (thousands)</th>
<th>Share of non-agricultural employment (per cent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing and mining</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Large-scale</td>
<td></td>
<td>6.4</td>
<td>202</td>
</tr>
<tr>
<td>b) Small-scale</td>
<td></td>
<td>5.0</td>
<td>150</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td>6.7</td>
<td>72</td>
</tr>
<tr>
<td>Public utilities</td>
<td></td>
<td>8.2</td>
<td>16</td>
</tr>
<tr>
<td>Trade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Wholesale</td>
<td></td>
<td>5.9</td>
<td>24</td>
</tr>
<tr>
<td>b) Retail</td>
<td></td>
<td>4.1</td>
<td>190</td>
</tr>
<tr>
<td>Finance and real estate</td>
<td></td>
<td>5.5</td>
<td>20</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
<td>5.1</td>
<td>126</td>
</tr>
<tr>
<td>Services</td>
<td></td>
<td>3.9</td>
<td>450</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>4.6</td>
<td>1,250</td>
</tr>
</tbody>
</table>

374. The spatial structure of the metropolitan economy is at present characterized by heavy concentrations of large-scale manufacturing and other activities. In 1969/1970 an estimated 38 per cent of large- and small-scale manufacturing employment was in the S.I.T.E. area; 18 per cent was in Karachi and Landhi. In the transport and wholesaling sub-sectors, approximately 58 per cent of all employment was in the port area and the central City. Approximately 51 per cent of retail trade and personal services and 82 per cent of business services were concentrated in the central City area. Together, these percentages of these sectors constituted approximately 45 per cent of all employment.

375. The overall strategy for the metropolitan economy, reflecting the broad development objectives identified in Chapter IV and the locational advantages of Karachi identified in Chapter V, is discussed later, in Chapter X. It is concerned with improving conditions for households with monthly incomes of Rs.500 and less; improving the distribution of consumption, within the constraints imposed by the need to achieve minimally adequate consumption levels for basic goods and services; increasing aggregate consumption within the constraints imposed by the overriding concern with greater equity; contributing as fully as possible to the public and private capital formation necessary to sustain economic growth; reducing foreign trade deficits and external debt; and keeping the economic risks of development as low as possible and distributing risk as equitably as possible.

376. These changes reflect sector policies which place an increased emphasis on labour-intensive technologies and an overall development strategy which calls for increased outlays in water supply, environmental sanitation, other public works and private-sector construction for housing, industry and commerce.

377. Karachi's economic development is still passing through a stage in which there is likely to be considerable growth in manufacturing prior to the increases in the shares of trade and service activities which are likely to characterize later stages of development.

378. There are not likely to be dramatic changes in the composition of metropolitan output or employment during the next 11 years. Total metropolitan non-agricultural product is expected to increase from approximately Rs.722 crores at present to something of the order of Rs.1,089 crores by 1980 and Rs.1,538 crores by 1985 (all measured at constant factor cost 1969/1970). Non-agricultural employment is expected to grow from an estimated 1,250,000 at present to approximately 1,635,000 by 1980 and 2,046,000 by 1985.

379. The shares of the construction and utilities sectors in output are expected to increase from about 10.8 per cent to about 12.4 per cent and from about 1.9 per cent to about 2.7 per cent respectively in the period 1974-1985. The share of the services sector in output is expected to decrease from about 13.0 per cent to about 11.7 per cent. The share of trade (wholesale and retail) in output is expected to decrease from 15.9 per cent to about 15.0 per cent. The shares of the services sector in employment are expected to change significantly during the same period are small-scale manufacturing services (up from 12.0 per cent to about 12.7 per cent), construction (up from 5.7 per cent to about 7.1 per cent), utilities (from about 1.3 per cent to approximately 1.9 per cent), and services (down from 36.0 per cent to about 33.4 per cent). Other sectors whose shares in employment are expected to change somewhat less markedly than these but nevertheless noticeably are wholesale trade (up from about 1.9 per cent to about 2.2 per cent), transportation (up from about 10.1 per cent to about 10.6 per cent) and retail trade (down from 15.2 per cent to about 14.5 per cent).

380. The increasing share of the small-scale manufacturing sector in employment and its growth rate reflect the emphasis that is to be given to labour-intensive manufacturing...
The increase in the share of wholesaling in employment and its relatively high growth rate reflect a continuing emphasis on the development of the Metropolitan Area's export and port functions.

The increase in the share of transportation in employment reflects, in part, the port expansion proposed, suggested the development of railway facilities, including a new Marshalling Yard and proposed improvements to the existing civil infrastructure, together with major additions to the metropolitan area.

The decline in the share of retail trade and services output and employment reflects increases in the share of other sectors, including a slight increase in the share of manufacturing.

The basic strategy for the development of the economy is discussed in Chapter X. The following section deals with the physical structure of the Metropolitan Area, including major land development and locational factors influencing the location of economic activity.

C. THE PHYSICAL DEVELOPMENT OF THE METROPOLITAN AREA

1. The existing physical structure of the Metropolitan Area

The forces that have structured the Metropolitan Area have been primarily the familiar economic determinants of urban land use and a series of institutional forces peculiar to Karachi.

These institutional forces deserve special mention because they have much to do with the Metropolitan Area's present form and its growth potential.

In its early development beyond the stage of being a mere fishing village, the City was a colonial headquarters. Parts of its central area are well endowed with public open space and large residential gardens as a result of this.

After the British occupation in 1839, Karachi Cantonment, the first of a series of extensive defence areas, was established. Even then, the Cantonment occupied 1,600 acres and has since been expanded to approximately 3,000 acres. Other cantonments lie in the paths of growth of the metropolis to the west, northeast and southeast. Together, they total 29,000 acres of land. Land within them is under-utilized. They serve as an effective barrier to the economic growth and development of the City. Eventually there should be a phased conversion of cantonments and other defence lands to other urban uses, as described in Chapter XVIII.

From 1947 to 1961, Karachi was the capital of Pakistan, resulting in the creation of additional offices, official residences and gardens consistent with its national status.
390. Most of the land is publicly owned. This gives the advantage of providing a remarkable opportunity to guide metropolitan growth, coupled with the disadvantage of making land development decisions very vulnerable to political pressure rather than the pressures for an efficient use of space that characterize a normal urban land market.

391. The financing of urban infrastructure is largely ad hoc, on a scheme-by-scheme basis, with the result that the principal development authority must base its decisions on the need to generate income for its own survival, which may or may not coincide with a long-term growth strategy that would be best from a metropolitan point of view. Public capacity for the installation of major infrastructure is fairly well developed; capacity for the installation of secondary infrastructure and for the operation and maintenance of urban facilities is not. In many individual development schemes "outer" development is undertaken by public agencies, leaving "inner" development to housing societies and other private entities, many of which are not equipped to complete that inner development. The political pressures to which land development is subject often result in a public willingness to extend major infrastructure into fringe areas long before they are truly ripe for development. The extreme inequities in household income distribution have resulted in access to the formal urban land market being restricted to a very small proportion of the Metropolitan Area's households.

392. As a result of the combined economic and institutional forces that have shaped it, the area's physical development is characterized by a high proportion of low density land uses and open space, even in the heart of the City. Huge defence areas at very low densities are surrounded by high density civilian urban development or lie in the path of the next stage of metropolitan growth. The Metropolitan Area contains a large acreage of fully or partially serviced land that is still unutilized, while the poor are crowded illegally on public lands or in left-over areas. Arterial roads, water mains and trunk sewers have been installed at fairly high standards but local roads, water distribution systems and local sewer connections are sub-standard or entirely lacking.

393. The existing land use structure is summarized in the map Karachi Metropolitan Area: Land Use, 1974 and Table VI.10.

394. The gross urban density of 68 persons per acre for 1970 is extremely low relative to actual space needs and transport costs. It does not include vacant developed land or defence lands. If these areas are added, the gross density is reduced to approximately 39 persons per acre.

395. Net residential densities vary tremendously through the Metropolitan Area. In some cases they are as high as 1,100 persons per acre in structures of predominantly one to four stores while in high-income areas with one- and two-storey bungalows the densities are as low as 90 persons per acre and in some cases much less. These differences are not as much differences between high-rise densities as they are differences between low-rise squatter and low-rise opulence.

396. The proportion of land used in transport rights-of-way is relatively high because of the high standards at which arterial roads were developed after the preparation
<table>
<thead>
<tr>
<th>Criterion</th>
<th>1970</th>
<th></th>
<th>1970</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Hectares</td>
<td>Percent</td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>16,470</td>
<td>6,670</td>
<td>31.6</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>680</td>
<td>270</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>460</td>
<td>190</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>1,730</td>
<td>700</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>Assembly</td>
<td>290</td>
<td>120</td>
<td>0.5</td>
<td></td>
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<tr>
<td>Religion</td>
<td>260</td>
<td>140</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Commerce</td>
<td>650</td>
<td>260</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Residential manufacturing</td>
<td>270</td>
<td>110</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Parks and playgrounds</td>
<td>1,040</td>
<td>420</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>Burial grounds</td>
<td>1,220</td>
<td>490</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Transportation r-o-w</td>
<td>10,370</td>
<td>4,300</td>
<td>21.2</td>
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<tr>
<td>Total residential</td>
<td>33,540</td>
<td>13,570</td>
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<tr>
<td>Manufacturing</td>
<td>4,400</td>
<td>1,660</td>
<td>8.1</td>
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<tr>
<td>Wholesale</td>
<td>330</td>
<td>130</td>
<td>0.7</td>
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<tr>
<td>Construction</td>
<td></td>
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<td></td>
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<tr>
<td>Utilities</td>
<td>1,650</td>
<td>670</td>
<td>3.4</td>
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<tr>
<td>Transport terminals</td>
<td>3,170</td>
<td>1,280</td>
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<td>Transportation r-o-w</td>
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<tr>
<td>Protection and reserves</td>
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</tr>
<tr>
<td>Total non-residential</td>
<td>15,490</td>
<td>6,270</td>
<td>31.6</td>
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<tr>
<td>Total urban</td>
<td>49,030</td>
<td>18,940</td>
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<tr>
<td>Vacant</td>
<td>12,310</td>
<td>4,980</td>
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<td>Developed</td>
<td>25,090</td>
<td>10,160</td>
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Population

<table>
<thead>
<tr>
<th>Densities (persons per unit area)</th>
<th>Residential</th>
<th>Residential</th>
<th>Residentiary</th>
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<tbody>
<tr>
<td></td>
<td>Urban</td>
<td></td>
<td></td>
<td>68</td>
<td>168</td>
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</table>

Intensities (area per unit population)

<table>
<thead>
<tr>
<th>Intensities (area per unit population)</th>
<th>Residential</th>
<th>Residential</th>
<th>10.020</th>
<th>40.6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td></td>
<td>14.650</td>
<td>59.3</td>
</tr>
</tbody>
</table>

a/ Total may not sum to items due to rounding.

b/ Acres per 1,000 inhabitants, or square meters per person.

N.A. = not available or not applicable.
397. The relatively low proportion of land use in parks and playgrounds at present is somewhat misleading because of the very large amounts of other types of open space that exist in the Metropolitan Area; park and playground standards need to be raised but not dramatically.

398. Except for large-scale manufacturing and other modern subsectors in the economy, employee densities are generally high. High employee densities in predominately one- and two-storey structures characterize Karachi's land use in a way that is typical of metropolitan development in major cities in most of the developing world. They are indicative of the standards for which it is realistic to provide in the near future.

399. Land development, allotment policies and the installation of roads, water and sewerage facilities encourage the development of outer areas rather than inner areas. For the decade 1960-1970 there was relatively little population growth in the old Central and Saddar/McLeod Road areas; moderate growth (40 to 50 per cent) in the Lyari, Kemari/Port and Golimar and Liaquatabad areas; rapid growth (over 100 per cent) in the North Karachi, Defence/Clifton and Korangi-Landhi areas. The growth at the outskirts of the City was the result of the establishment of the new areas of Korangi, North Karachi, Qasba, Auranqi, Baldia, Nazimabad, North Nazimabad, the Federal "B" area, the Defence Housing Society area, Clifton, Bath Island and the Housing Societies area. There was thus a fairly large-scale decentralization of population during the decade caused largely by public development decisions.

2. Structuring principles

400. Six structuring principles underlie the basic physical development strategy that is recommended for the Metropolitan Area for 1974-1985:

(a) To keep capital costs as low as possible and fully utilize the capacity of the Metropolitan Area's existing physical facilities.

(b) To distribute the costs of capital improvements equitably among users in individual localities when they directly benefit those localities. The physical standards established must be related realistically to local ability to pay.

(c) To keep operating costs of utilities, facilities, and transport low with an equitable distribution of costs to users. These concerns have affected not only the standards recommended for infrastructure and the overall configuration of infrastructure systems but also the ways in which land uses are related to one another.

(d) To optimize the benefits that can be affected by the physical structure of the Metropolitan Area, and the equitable distribution of those benefits. Decisions on such things as the composition and scale of land uses and facilities and their locations relative to one another affect the incomes that can be expected from them. The intensity of development and its physical structure affect land values.
The activities allowed, their scales, their intensities and their physical organization affect the extent to which firms and individuals can benefit from the individualism that characterize much urban production and consumption.

1. To improve physical comfort levels in the metropolitan environment, which will be affected by the detailed physical design of urban facilities; as well as their over-all configuration.

2. To keep the risks associated with the Metropolitan Area's physical form as low as possible and to distribute those risks as equitably as possible. This concern has influenced the recommendation to remove major defense installations from the Metropolitan Area, the recommendation to make the metropolitan water supply system much less vulnerable to bulk supply failures and breakdowns in individual segments of the system than it is at present, and the recommendation to focus improvements in facilities on low-income households first, since the low-income groups usually suffer most severely when breakdowns in the City's physical systems occur.

3. The growth strategy

401. The metropolitan growth strategy recommended is portrayed in the diagram Basic Physical Growth Strategy. 1974-1985. This strategy has three major components: 1) provision for new growth; 2) intensification of existing development; and 3) restraint and renovation.

402. The main thrust of new growth up to 1985 is to the northwest (Baldia-Aurangzi), the southeast (in the undeveloped parts of Korangi), and the east (Khanto and Pipri). The new growth areas are ones in which it is relatively easy to achieve a reasonable balance between residential development and existing or new job opportunities. They are areas that can be provided with infrastructure and essential urban services relatively inexpensively and they are areas in which the risks associated with new development programmes will be relatively low.

403. The major areas for intensification are a belt extending from North Karachi across the northeast side of the City and down into Korangi, the parts of the Korangi area that are already provided with at least partial infrastructure and the parts of Clifton which are equipped with basic infrastructure.

404. In each of these intensification areas substantial unutilized infrastructure capacity already exists in the arterial road system, water mains, or trunk sewers. Some localities have unused capacity in all three of these infrastructure components. The three intensification areas all contain substantial acreages of serviced land that is not occupied.

405. Restraint on growth and major renovation up to 1985 is recommended for the heart of the Metropolitan Area. It contains a large share of the Metropolitan Area's population. Much of it is occupied by desperately poor households living at high densities in localities which have only intermittent supplies of unsafe water and virtually no adequate sanitation.
406. The estimated 1974 and 1985 populations in individual areas are shown in Table VI.11, Karachi Metropolitan Area: Population distribution, 1974 and 1985.

Table VI.11

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>City west</td>
<td>A</td>
<td>874 000</td>
<td>974 000</td>
<td>100 000</td>
</tr>
<tr>
<td>City east</td>
<td>B</td>
<td>530 000</td>
<td>680 000</td>
<td>150 000</td>
</tr>
<tr>
<td>S.I.T.E.-Golimar-Nezimabad</td>
<td>C</td>
<td>505 000</td>
<td>605 000</td>
<td>100 000</td>
</tr>
<tr>
<td>Clifton</td>
<td>D</td>
<td>209 000</td>
<td>309 000</td>
<td>100 000</td>
</tr>
<tr>
<td>K.P.W.</td>
<td>E</td>
<td>111 000</td>
<td>127 000</td>
<td>16 000</td>
</tr>
<tr>
<td>Gulshan-e-Iqbal</td>
<td>F</td>
<td>58 000</td>
<td>158 000</td>
<td>100 000</td>
</tr>
<tr>
<td>Taimuria-Mansoors</td>
<td>G</td>
<td>389 000</td>
<td>490 000</td>
<td>101 000</td>
</tr>
<tr>
<td>North Karachi</td>
<td>H</td>
<td>121 000</td>
<td>321 000</td>
<td>200 000</td>
</tr>
<tr>
<td>Baldia-Aurangi</td>
<td>J</td>
<td>304 000</td>
<td>654 000</td>
<td>350 000</td>
</tr>
<tr>
<td>Mauripur</td>
<td>K</td>
<td>7 000</td>
<td>7 000</td>
<td>-</td>
</tr>
<tr>
<td>Korangi</td>
<td>L</td>
<td>483 000</td>
<td>1 058 000</td>
<td>575 000</td>
</tr>
<tr>
<td>Civil airport</td>
<td>M</td>
<td>302 000</td>
<td>352 000</td>
<td>50 000</td>
</tr>
<tr>
<td>Scheme 33</td>
<td>N</td>
<td>23 000</td>
<td>143 000</td>
<td>120 000</td>
</tr>
<tr>
<td>Khanto</td>
<td>O</td>
<td>98 000</td>
<td>548 000</td>
<td>450 000</td>
</tr>
<tr>
<td>Pipri</td>
<td>P</td>
<td>19 000</td>
<td>269 000</td>
<td>250 000</td>
</tr>
<tr>
<td>Malir</td>
<td>Q</td>
<td>32 000</td>
<td>32 000</td>
<td>-</td>
</tr>
<tr>
<td>Hab Valley East</td>
<td>R</td>
<td>-</td>
<td>50 000</td>
<td>50 000</td>
</tr>
<tr>
<td>Hab-Chauki</td>
<td>S</td>
<td>-</td>
<td>6 000</td>
<td>6 000</td>
</tr>
<tr>
<td>East Karachi</td>
<td>T</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Godap</td>
<td>U</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dhaobi-Gharo</td>
<td>DG</td>
<td>30 000</td>
<td>104 000</td>
<td>74 000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>4 161 000</td>
<td>6 947 000</td>
<td>2 786 000</td>
</tr>
</tbody>
</table>

Source: National Pilot Project No.1 estimates.

407. The clusters identified in the table are statistical areas used for analytical purposes in the Project. Their boundaries and the boundaries of analysis zones within them are shown in the map Karachi Metropolitan Area: Clusters and Analysis Zones. They are identified here to assist in relating data in this report to data in other, more detailed reports prepared during the course of the Project.

408. The changes summarized in Table VI.12 reflect the growth strategy and are generalized in the map Basic Metropolitan Growth Strategy, 1974-1985. They are important also in relation to the priorities for 1974-1985. More detailed analyses prepared previously in the Project indicate the approximate socio-economic structure of the population in each cluster.2/

The major areas in which it is proposed to increase population in the period 1974-1985 are the new growth areas and intensification areas referred to earlier. Some increase will occur in areas designated for restraint and renovation also, responding to pressures for development there and the availability of vacant land, but this growth should be restricted as fully as possible.

The principal population additions in new growth areas, in order of magnitude, are expected to be in Karimabad (an additional 450,000), Badin-Aurangi (an additional 350,000), Pippa (an additional 250,000) and Scheme 33 (an additional 120,000); lesser growth is expected to occur in Dhabeji/Gharo (an additional 75,000) and Hub Chauki (a new increment of 50,000).

Additions in intensification areas will include Korangi (an additional 575,000), North Karachi (an additional 200,000), the Societies area (an additional 150,000), Gulshan-e-Iqbal (an additional 100,000) and Clifton (an additional 100,000).

Growth in the areas designated for restraint and renovation will include the central City (an additional 100,000), the S.I.T.E.-Golimar-Nazimabad area (an additional 100,000), Taimuria-Mansoora (an additional 100,000), and the Karachi Port Trust area (an additional 16,000).

Outside these three types of strategic areas there is expected to be an addition of 50,000 in the vicinity of the civil airport. There are not expected to be significant increases in population in Mauripur, Malir or West Karachi.

4. The physical framework

In the physical structure proposed there are key elements which, because of their scale and relative permanence, constitute a framework around which other less critical development can be organized. These key elements, shown in the diagram Karachi Metropolitan Area: The Physical Framework, 1985, are the ports and civil airports, existing and proposed major industrial complexes, major trade and service centres, the principal rail and road transport networks and major agricultural areas. Other elements that are important include major institutional complexes, metropolitan and sub-metropolitan recreation and tourism areas, special areas enhanced for historic or other reasons and the major subsurface networks including water supply, sewerage and drainage that both shape and support development.

Major industrial complexes exist already at S.I.T.E. and in the Korangi-Landhi area. It is proposed that manufacturing expansion in the S.I.T.E. area be limited and that new manufacturing growth be focused on a consolidation of the industrial complex in Korangi-Landhi and the opening up of two new complexes as part of the overall strategy of distributing infrastructure loadings and bringing job opportunities and places of residence as close together as possible.

One of the new complexes proposed, in North Karachi, is in response to the severe deficit of job opportunities relative to population in the North Karachi area. It is also
in a location that can be serviced relatively easily with water, sewerage, electricity and gas. It is on the Super-highway, one of the main road links to the east and upcountry. The Superhighway and a bypass around the downtown area via Estate Avenue connect the North Karachi site relatively easily with Karachi Port; a new transport corridor proposed via Malir will link it with the new Steel Mill site in Pipri and the new port at Sundar Qasim.

417. The second major new complex, at Pipri, is based on the Steel Mill that is to be located there. It is an excellent site for future industrial expansion because of its proximity to the new port and to the main transport (rail, as well as road) and utility arteries linking the Metropolita- 

418. The most important trade and service centres proposed are the existing McLeod Road-Saddar complex, in which there still is a great deal of scope for expansion, sub-metropolitan centres in Korangi and the Liaquatabad/Federal “B”/North Karachi area and a future metropolitan complex to be encouraged in the vicinity of the junction of Rashid Minhas Road and University Road. This location is suggested because it will be well centralised in relation to the future development proposed, including likely development up to the year 2000, and because the existing transport network, together with additional transport facilities that are to be developed, will make it highly accessible to all parts of the densely built-up urban area. It is also far enough from the existing downtown functions in the McLeod Road-Saddar area to distribute loadings from such functions in such a way that it should be possible to avoid excessive downtown congestion. At the same time, it is close enough to the existing downtown complex to permit necessary 10-minute door-to-door commuting provided that modern transit facilities are available.

419. Other substantial but less dominant sub-metropolitan 

trade and service centres are recommended for development in Baldia, North Karachi and Khanto to serve the population concentrations that will be located in these areas by 1985 and subsequently.

420. In addition to these concentrations of manufacturing trade and service activity, a large part of economic activity should be dispersed in smaller centres and in residential areas both to reflect current economic and cultural reality to support the objective of bringing job opportunities and places of residence close together, thus minimizing metropolita- 

421. The arterial road transport network has three major components:

(a) the three existing highway links to the west, the northeast and the east:
[B] a series of corridor arterials linking Baldia, North Karachi, Northeast Karachi (the Scheme 33 area), Gulshan-e-Iqbal and Pipri with the downtown; these include a North Karachi/Gulshan-e-Iqbal/Korangi corridor passing through the proposed new metropolitan trade and services complex and a new downtown/Pipri multi-channel corridor passing through Korangi and Khanto, and defining the major metropolitan growth path to the east.

[C] a combined circumferential and radial network providing accessibility within the most densely built-up parts of the existing city. The combination of this radial-circumferential road system and a series of corridors linking outer areas with downtown and each other is intended to reinforce the strategy of distributing major concentrations of urban activity through the Metropolitan Area by providing the accessibility that is essential to the success of this dispersal strategy.

422. Up to 1985, the rail network does not need to change substantially, except for a strengthening of the circular railroad, which will begin to function as a significant commuter line as population densities around it increase, and a linking of the Steel Mill and the new port at Bundar Bazar with the main rail system.

5. Land use

423. The geographic structure of land use proposed for 1980 and 1985 is shown in the map Karachi Metropolitan Area: Land Use 1980 and 1985. It reflects the structuring principles, physical framework and growth strategy described.

424. The key land uses deployed as structuring elements around which other uses are organized were identified in the description of the physical framework -- the ports and airports, major manufacturing complexes, metropolitan and sub-metropolitan trade and service centres, the arterial road and rail networks and agriculture. Other key land uses that will help to shape sub-areas in the metropolis include metropolitan and sub-metropolitan institutional areas and metropolitan and sub-metropolitan recreation, tourism and environmental enhancement.

425. Major institutional areas contain primarily health, educational and cultural activities. In general, they are in locations with high accessibility to major population groups and are linked with, or close to, major trade and service centres because both types of activity grouping require high accessibility and because they reinforce each other in giving an identity to individual sub-metropolitan areas and in upgrading sub-area environments. Their role in this is particularly important, for example, in Lyari, Baldia, Aurangi, North Karachi, Gulshan-e-Iqbal, Clifton, Korangi, Khanto and Pipri. The locations identified for metropolitan and sub-metropolitan recreation, tourism and environmental enhancement are dictated partly by natural features such as the shoreline and areas of interesting topography. In other cases, major recreation space is provided in highly accessible locations and used with institutional centres and trade and service centres to establish area identity and upgrade area environments.
426. The environmental enhancement proposed includes protective belts of planting and open space to help screen conflicting uses from one another (between industrial and residential areas in North Karachi, for example) and to improve local climate and physical comfort (as in Baldia, Aurangi, Scheme 33, Clifton, Korangi, Khanto and Pipri, where belts of planting are used to help screen residential areas from the nearby desert and reduce the severity of the impact of sand and dust storms).

427. The physical hazards and noise associated with flight paths and the protective zones around special facilities are kept low by excluding new growth from affected areas as fully as possible. It is hoped that the environmental problems associated with the defence installations and the two military airports that pose the most immediate threat to civilian populations and most immediate obstacles to metropolitan growth will be eliminated when these facilities are moved, as recommended in Chapter XVIII.

428. In the map of land use for 1980 and 1985 and in Table VI.12 the term residential is used, as well as the term residential. This is to reflect the interdependence of residential uses with other uses linked intimately with residences. Residential uses therefore include part of the land required for government functions, health, education, assembly religion, commerce, parks and playgrounds, burial grounds and transportation rights-of-way. They also include residential manufacturing. In Karachi, as in urban areas in most of the developing world, non-residential and residential activities are intermingled. Shops and workshops often occupy the ground floor or the front room of a house and a considerable amount of commercial activity and manufacturing is diffused throughout residential areas. This is a reality that must be recognized because it reflects economic and cultural conditions that are not likely to change in the near future. It also represents an efficient use of space and an environmental vitality that should be preserved.

429. The total projected increase in urban acreage between 1970 and 1985 is approximately 38,000 acres — about 77 per cent of the urban use in 1970. In the same 15-year period, urban population is expected to have increased by approximately 107 per cent, reflecting the higher residential densities proposed for development in the period 1974-1985.

430. The overall urban density is expected to increase from 68 persons per acre in 1970 to 79 persons per acre in 1985. This increase reflects primarily the increase proposed for net residential density — from 213 persons per acre in 1974 to 257 persons per acre in 1982 — and an increase in residential densities from approximately 100 persons per acre in 1974 to 123 persons per acre in 1985. The increase in net residential density is a result of the housing programme proposed for the next 11 years, which includes a proportion of dwelling units on small plots (80 and 120 sq. yards) and represents a shift away from the extravagant use of urban land that has characterized the recent past, with middle- and upper-income groups in large plots.

431. In general, employee densities decrease between 1974 and 1985, reflecting an expected modernization of industry and commerce.
<table>
<thead>
<tr>
<th>Land Use</th>
<th>1985</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Hectares</td>
<td>Per cent</td>
</tr>
<tr>
<td>Residential</td>
<td>26,647</td>
<td>10,789</td>
<td>30.6</td>
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<tr>
<td>Government</td>
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<td>N.A.</td>
</tr>
<tr>
<td>Health</td>
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</tr>
<tr>
<td>Education</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Assembly</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Religion</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Commerce</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Residencitry mfg</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Parks and playgrounds</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Burial grounds</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Transportation r-o-w</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Total residential</td>
<td>55,694</td>
<td>22,545</td>
<td>63.9</td>
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<tr>
<td>Manufacturing</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Wholesale</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Construction</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Utilities</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Transport terminals</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Transportation r-o-w</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Protection and reserves</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Total non-residential</td>
<td>31,412</td>
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</tr>
<tr>
<td>Total urban</td>
<td>87,106</td>
<td>35,256</td>
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<tr>
<td>Vacant developed</td>
<td>N.A.</td>
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<td>N.A.</td>
</tr>
<tr>
<td>Defence</td>
<td>25,098</td>
<td>10,157</td>
<td>N.A.</td>
</tr>
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</table>

Population  6,839,000

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Residential</th>
<th>Residencitry</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Densities (persons per unit area)</td>
<td>257</td>
<td>823</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Intensities (area per unit population)</td>
<td>3.896</td>
<td>8.143</td>
<td>12.737</td>
<td></td>
</tr>
</tbody>
</table>

\(a/\) Acres per 1,000 inhabitants, or square meters per person. N.A. = not available or not applicable.
432. Space standards will, of course, vary greatly in individual sub-areas in the Metropolitan Area and there will be a systematic relationship between residential space standards and the socio-economic structure of populations in individual areas. The development of space standards for individual community types is part of the intensive detailed planning that should take place in 1974. Space standards for an initial community have been developed in the first Metroville Project that is to be described later.

D. PRIORITY AREAS

433. The areas deserving highest priority for action are shown in the map Karachi Metropolitan Area: Priority Areas 1974-1983. They are of three principal kinds: emergency areas; areas requiring supplementary services and suitable for intensification; and new growth areas.

1. Emergency areas

434. These are areas whose populations are in desperate need of employment, safe potable water and basic environmental sanitation, improved education services, basic health services and decent shelter. They should be provided with these on an emergency basis.

435. Most of the areas are unauthorized colonies. Those in acceptable long-term locations should be regularized. Some should eventually be converted to other uses but need to be made environmentally sound, in a rudimentary sense, immediately pending the development of alternative locations for their populations. Some of them have recently been regularized but not yet provided with essential services. Most of them are in the established inner areas of the City or have grown up in outlying areas close to job opportunities or on public land where occupancy does not have identified with it formal obligations to pay rent or taxes (although informal systems of rental or "protection" charges have emerged in many of these areas). The Improvement and Regularization Programme discussed in Chapter XI is a response to the need for emergency action.

436. Two examples of emergency areas are Lyari (area 1 in the map) and Chanesar Goth (area 2 in the map). Improvement schemes have been prepared for both of these by the KMC. Conditions in the jhuggi areas that constitute a majority of the emergency areas have been analyzed in a series of reports prepared in the Karachi Planning Project. The areas regularized recently are identified in the map Karachi Metropolitan Area: Existing Squatter Settlements in Chapter XI.

2. Areas requiring supplementary services and suitable for intensification

437. The populations of these areas are generally better off, in terms of employment, household income, availability of water, basic sanitation and shelter than those of the emergency areas but they are nevertheless living under very unsatisfactory conditions. Some, such as those in Gulshan-e-Iqbal, are better off than others and the nature and level of supplementary services required therefore varies from area to area. Most of the households affected are in need of major improvements in water supply, sanitation, transport to places of work, education services, health services and support programmes to help them improve their own housing.

438. The areas suitable for intensification have under-utilized capacity in water mains, trunk sewers, roads or combination of these facilities, and contain substantial areas of serviced but unutilized land. Previous planning for the areas has been at unrealistically low densities and they need replanning urgently, prior to the installation of supplementary services and further allocation of plots. The two principal examples of such areas are Korangi (area 4 in the map) and the North Karachi/Gulshan-e-Iqbal corridors (area 4 in the map).

439. Preliminary replanning for Korangi (which extends over approximately 24,000 acres) has already been initiated in the Master Plan Department. At a gross density of 80 persons per acre (the average density for urban development in 1985) it could accommodate approximately 1,900,000 people. The previous plan for Korangi was for a population of only 500,000-750,000, representing a gross density of only 20-30 persons per acre. This is a population inconsistent with the DTP development objectives and unrealistic relative to households' ability to develop and use residential space economically. It is also inconsistent with the large acres designated for industrial development in the original Korangi plan itself if there is to be a reasonable balance between places of residence and workplace. The preliminary replanning that has been done suggests the total population that should be supported in the area, the likely socio-economic structure of that population, a strategy for industrial land development and a desirable mix of plot sizes and housing.

440. A third area capable of intensification is in Clifton (area 3 in the map). A revised scheme for the Kowari/Clifton area (KBA Scheme No.51) was prepared recently. It upgrades the recreational and tourist facilities in the area and provides for predominantly upper-middle and high-income development on the western side of the scheme near Karachi Port.

3. New growth areas

441. These are the areas that should be opened up for new development in the period 1974-1985 because they are close to existing or proposed job opportunities and because

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they can be serviced at relatively low cost. They are in locations in which pressures for development are expected during the next 11 years.

443. The principal examples of such areas are AURANGI (area 6 in the map), Baldia (area 7 in the map), KANTO (area 9 on the map), and Pipri (area 10 on the map). AURANGI and Baldia are close to existing and future job opportunities in the S.I.T.Z complex, the Karachi Port and downtown. Because of this, there already has been a considerable amount of low-income growth in the vicinity of both. Scheme 33 is an area that is reasonably accessible to the downtown via the Superhighway, and even more accessible to the new metropolitan commercial and service complex proposed around the junction of Husain Minhas Road and University Road. There is already considerable pressure for middle- and upper-income development there, although much of this pressure is at present speculative and should be discouraged in the 1974-1985 period.

444. KANTO is the next natural extension of the west-east corridor beyond Korangi. It is accessible to future job opportunities in Korangi, in the KANTO area itself and in the new industrial complex that is to develop in the Pipri area. Pipri is to be the site of the new Steel Mill and the industrial complex that is expected to be associated with it. Development in the period 1974-1985 should include the Steel Mill, the first stage of steel-related industrial growth, a new Railway Marshalling Yard and the first stage of the Steel Mill township (for which plans are now being prepared by the Steel Mill Corporation).

445. It is vital that the location of the Rail Marshalling Yard currently proposed to be located northeast of Lathi be reconsidered. The currently proposed site would pre-empt 10,833 acres of land that could be used to accommodate at least 115,000 persons and is in a very good location for residential development. If the Yard is located as currently proposed by PWR it will force the population to the northeast where building conditions will be more difficult and the installation and operation of facilities more expensive. Moreover, the dust and other pollution generated by the Yard’s activities would be likely to affect directly the population of the new Steel Mill Township to the north of National Highway No.1. The location of the Yard north of the PWR mainline would also require very costly grade-separated overpasses for the rail lines from Bunder Qasim Port and the Steel Mill complex, both of which are located south of the PWR mainline.

446. An alternative site has been identified by the Project team three to four miles east of the original site and to the south of the mainline. It has major advantages from the point of view of metropolitan growth and may well be advantageous for the Yard itself. The alternative site and the study required to evaluate the costs and benefits of the two sites are presented in Chapter VIII. It is important that the study be undertaken and a decision made in order to allow further planning of the KANTO area.

447. Preliminary planning has been done for the Baldia-AURANGI area and for Scheme 33, and by the beginning of 1974 relatively detailed planning for a Metroville Project in the Baldia-AURANGI area will have been carried to an advanced stage.
447. The Baldia-Aurangi area population is expected to grow from an estimated 304,000 in 1974 to approximately 654,000 by 1985. Baldia-Aurangi is expected to be a relatively low-income area for unskilled, semi-skilled and, to a lesser extent, skilled workers employed in S.I.T.E., the Karachi Port and downtown. Because of its accessibility to unskilled and semi-skilled job opportunities, it is likely to continue to be a major entry point for immigrants to the Metropolitan Area. The preliminary planning undertaken by the Master Plan Department indicates the socio-economic structure of the population that is likely to develop there, an appropriate mix of plot sizes and housing types and a structure for land use.

448. Two other new growth areas are shown in the map — Dhabeji/Gharo and Hab Chauki. These are much smaller in scale than the others. The growth proposed for Dhabeji/Gharo is primarily a reflection of the industrial development already established there and the fact that the area lies on the main transport and utility artery leading into Karachi from the east. The growth proposed for Hab Chauki reflects Federal and Provincial concerns to support industrial development in Baluchistan. Hab Chauki is on the Baluchistan-Sind boundary and in a location which can benefit from the urban services and facilities available in Karachi. It is also in an area where there are ample supplies of limestone for the production of cement. Shortly, one of the largest cement plants in Asia is to be developed there in a project which will have joint Pakistani and Japanese participation.

4. Scheme 33: A critical new growth area

449. Scheme 33 in northeast Karachi deserves special mention because it is in a location in which there is already considerable speculative demand for land and because the decisions that have been made about it in the past provide one of the clearest examples of the deficiencies in public land allocation procedures that must be rectified if there is to be any hope of establishing sound procedures for guiding metropolitan growth.

450. As the name of the area implies, a tentative "scheme" already exists. It is in urgent need of replanning. The original scheme was prepared primarily in response to pressures for speculative allocations of land before the formulation of the present Development Plan for the Metropolitan Area. Some of the land has already been allotted to housing societies. More allocations are imminent. The original allotments and those that are pending have no systematic relationship with the size and composition of likely metropolitan population growth or the pattern of metropolitan needs for infrastructure. They reflect no serious concern with an efficient use of public resources or a more equitable distribution of leasehold rights and urban services.

451. The population that would be provided for under the original scheme would be predominantly middle- and upper-income. The information available concerning the pending allotments

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indicates that no plot would be less than 160 square yards and approximately 25 per cent of the plots would be 600 square yards or more (including a number of 2,000 square-yard plots). The allotments that have already been made to four societies are scattered haphazardly and will be very expensive to service.

We can see plots for middle-income and high-income groups already available in Gulshan-e-Iqbal and many other areas and currently under development in Clifton and the Defence Cooperative Housing Society, there is little or no real need at this time for development for middle- and high-income groups in Scheme 33. If the land is developed now it will not be used efficiently and revenues will be much lower than they will be in the future when there is a real need for the development of the area.

One hundred and sixty-nine additional housing societies have recently been registered and approved for allotments. If each of them were to be allotted the minimum forty acres per society specified in the notification which establishes guidelines for grants of land to housing societies in KDA zones, schemes (Notification No. 869/71/4083 dated 22 June 1971), they would together be allotted 6,760 acres. At a gross residential density of 100 persons per acre, that acreage could accommodate 676,000 people. If the area is developed, a large part of the allocated land will remain unutilized during the six-year period and possibly longer. Most of it will remain unutilized in the maximum utilization period of two years specified in the Notification. The whole process would be simply a continuation of the very destructive past practice of allotment for speculation rather than real development.

If the allotments are made, KDA, as in the past, will be under tremendous pressure to service the area with roads and major utilities and a very large public expenditure that would be going into other parts of the Metropolitan Area in response to real needs for the improvement of substandard conditions and genuine new development will be wasted. Although the Notification provides for the resumption of land from societies found unfit to develop their areas in the time specified, this power is unlikely to be exercised. Even if it were, it could not recover the wasted public outlays for infrastructure that would have been installed.

Moreover, the location of such a large part of the total metropolitan growth expected in the next six years to Scheme III would destroy the concept of the corridor plan endorsed by the Policy Advisory and Steering Committee that is guiding the planning for the Karachi Region.

In response to the need for a rethinking of the strategy for Scheme 33, a series of preliminary proposals have been prepared in the Karachi Planning Project. These proposals, based on the overall Development Plan for the Metropolitan Area, suggest that a population of 120,000 should be

provided for up to 1985 in the Scheme 33 area. This would require the development of only a limited part of the area for which allotments are pending. Allotments made some time ago to four societies would be honoured, but all of the pending allotments would be reviewed very carefully to identify those that would be consistent with the metropolitan Development Plan and all subsequent allotments would be scheduled on the basis of this Plan. Notification No.869/71/4083 would be amended appropriately. KDA would be responsible for both inner and outer development to reduce the problems associated with public outer development and private inner development.

456. The map identifying priority areas for 1974-1985 shows also the two defence areas that lie most directly in the path of development during this period. The Drigh Road defence lands are blocking the growth of the proposed North Karachi-Gulshan-Korangi corridor; the defence lands in Landhi are blocking the natural expansion of the Korangi-Landhi-Khanto-Pipri corridor. Although neither of these areas can be converted to normal urban uses during the next 11 years, the map serves as a reminder of the importance of converting them as soon as possible after that as part of the strategy proposed for defence lands in Chapter XVIII.

457. The map is intended to provide a starting point for the detailed action programming and implementation that should be initiated in 1974 for individual sites. The planning and replanning already done or in progress for Lyari, Chanmerry Goth, Baldia-Aurangazi, Korangi, Scheme 33 and the Pipri area constitute a substantial start on this.

E. METROPOLITAN OPTIONS FOR 1985-2000

458. Several options are available for the size and form of the Metropolitan Area after 1985. The two major regional options for 1985-2000 were identified in Chapter V: a continuing consolidation of urban development in and around Karachi or a dispersed or urban growth in several centres in the Region. With the consolidated strategy, the population of the Karachi Metropolitan Area by the year 2000 may be of the order of 12,500,000; with the dispersed strategy it may be of the order of 9,000,000.

459. It is not desirable to recommend any one metropolitan structure option for the period 1985-2000 because of the uncertainties attached to resource availability after 1985, the extent to which the locational advantages of Karachi will have been exploited, the success achieved in bringing the Region's cultivable soils into intensive agricultural use, and the future urban structure.

460. Moreover, a number of key regional infrastructure investments have yet to be decided. It is not clear yet whether the Hab Dam water will be used directly for both agriculture and urban purposes or used first in the urban area and subsequently, after regeneration, for agriculture. The feasibility of large-scale water regeneration must be established. The relative emphasis to be placed on expansion of the existing port and new port facilities at Bundar Qasim is to be decided. The site for a new civil airport to be developed after the year 2000 has to be selected. The extent to which transport links to Baluchistan are to be improved is not yet determined.
Within the Metropolitan Area sites for new nuclear power plants have still to be selected and the feasibility of relocating major defence installation, the air bases at Zeign Road and Masroor in particular has yet to be established.

The important point to be recognized at present is that several options for 1985-2000 exist. Land allotments or other commitments in the 1974-1985 period that eliminate some of these options prior to their relative advantages and disadvantages being appraised more fully and prior to a decision concerning the desirable direction of overall regional growth should therefore be avoided strenuously.

1. Potential development areas

The principal areas in which intensification or new growth can occur after 1985 are the Baldia-Buleji area, the Baldia-Aurangi area, the Scheme 33 area, Korangi and the Chanto-Pipri area.

The Baldia-Buleji area is reasonably close to existing S.I.T.E. and downtown job opportunities. Additional industrial development could occur in the Masroor Air Base area and some light industry, as well as sub-metropolitan trade and commerce, could develop between the Air Base and Mill. Transport links to both the downtown and the RCD could be provided relatively easily. Extensions of water supply, sewerage and gas into the area are likely to be somewhat more expensive than for the other potential growth areas. Electric power could be provided easily. Environmentally, the Buleji-Hawkes Bay locality, in particular, is very attractive.

The Baldia-Aurangi area is highly accessible to existing industrial and downtown job opportunities. It also lies on the RCD Highway, the main route to the northwest and Baluchistan. Some additional industrial development could occur in Baldia and to the northeast of Aurangi (in the latter case, in the vicinity of the Valika industrial area). It can be provided with water supply, sewerage, electricity and gas relatively easily. If the valley between Baldia and Aurangi is developed sensitively, it could be very attractive environmentally.

The Scheme 33 area is reasonably close to the existing downtown. It is highly accessible to the new metropolitan trade and service complex proposed for the vicinity of Rashid Minhas Road and University Road. It would be accessible to the new industrial complex proposed for the eastern side of North Karachi. It lies astride the Superhighway, the main road link from Karachi to the east and upcountry. It could be serviced easily with water supply, sewerage, electricity and gas.

For the reasons stated earlier, intensification in the Korangi area has been recommended for 1974-1985. Continued intensification after 1985 is justifiable on the same grounds.

Additional growth in the Chanto-Pipri area should be encouraged for the same reasons that growth is to be initiated in 1974-1985 — presuming the successful development of the
new port at Bundar Qasim and a major industrial complex in
the vicinity of the Steel Mill.

2. The development options

469. With either of the regional options there are at
least four possibilities for the form of the Metropolitan
Area which can take advantage in various ways of the poten-
tial development areas. These four possibilities are sketched

(a) Development emphasis continuing in the east

470. Continued development in the east would make it
relatively easy to maintain a desirable balance between work
places and residential development. The capital and operat-
ing costs associated with growth there would be relatively
low. The eastern emphasis would help considerably to keep-
down population and activity loadings on the existing cen-
tral City. Development there would be highly accessible
to the environmental attractions of the Malir agricultural
belt, the hills to the north of Pipri and the coastal recrea-
tional opportunities in the Pipri estuary. If the new port
and the eastern industrial complex develop as planned, it
would be a low-risk option. It would be a natural increment
in the growth to the east that is foreseeable for the period
after the year 2000.

(b) Development emphasis shifted to the
northeast and west

471. Emphasis on the northeast and the west could main-
tain a reasonable balance between work places and residential
development, but probably would rely on job opportunities
in the existing Karachi City area somewhat more heavily than
would the first option. Capital and operating costs may be
somewhat higher than the first option and the risk of over-
loads on the existing central City area would be somewhat
higher since this second option continues to compact devel-
ompent around the existing City. It depends on the conver-
sion of the Nasoor Air Base to urban use. Because of the
likelihood of a continuing demand for plots close to the
present City, the public risks associated with the opening
up of new land in the west and the northwest are likely to
be low.

(c) Development emphasis shifted to the northeast

472. The option shifting development emphasis to the north-
east would have features similar to those of the second option,
but it would be more difficult to maintain a satisfactory
balance between work places and residential development.
Operating costs (for commuters) and the risks of adding to
downtown congestion are likely to be somewhat higher than in
the second option.

(d) Dispersed development

473. Dispersing development within the Metropolitan Area
probably would be the most satisfactory from the point of
view of linking places of work and residential development
as closely as possible. Capital and operating costs are
likely to be relatively low. The risk of overloading the
existing City area is likely to be somewhat higher than in
the first option, but lower than in the second and third.
Development emphasis continuing in the East

Development emphasis shifted to the Northeast and West

Development emphasis shifted to the Northeast

Dispersed development

Metropolitan Development Options
1985 - 2000
WATER RESOURCES DEVELOPMENT

A. TRENDS AND ISSUES

The present water resource technology is costly, wasteful of water, makes Karachi vulnerable to system failure, and does not support agricultural development or environmental enhancement in the region. Water demand is increasing rapidly.

1. The Water Husbandry Area

The Water Husbandry Area for the Karachi Region is shown on the map, Karachi Region: Proposed Water Husbandry Area (1:100,000). The Water Husbandry Area includes the entire catchment areas of the Baran and Malir Rivers, and the Hub River basin, a total of 3,291 square miles.

2. Precipitation

Precipitation in the area averages 7.7 inches per year, but the variation from year to year is large. Most rainfall occurs from July to September. Individual storms can bring as much as four inches of rain with two inches in one hour.

3. Physical conditions

The Region has a series of rugged ridges and valleys to the east, northeast and northwest of Karachi. Alluvium has been deposited in the lower elevations of the area by both the Indus and the streams of the area. Most of the alluvial plain is well drained, but the lower sections are subject to waterlogging and the lowest sections, which border the sea, are swampland with an extensive system of tidal creeks.
478. The vegetation of the area is restricted to scrub brush, grasses and a few hardy trees. There is at present intensive agriculture only in the Malir Valley. Runoff is rapid due to the lack of vegetation and in many cases soil erosion is extensive.

479. There are four major drainage basins in the area grouped into two catchment areas. The Upland catchment area includes the Baran River basin, the Malir River basin, the Lyari River basin and the Hab River basin.

480. There are perennial flows in the upper reaches of the three largest rivers, but evaporation losses and infiltration result in an absence of flow in the lower reaches except during periods of sustained rainfall.

481. Flood flows in all of the area’s streams may be very large resulting in crop damage and deterioration of soil in rural areas and property damage, injury, death and sanitation problems in urban areas.

482. The characteristics of the subsoils of the Region are only partially known, but sufficient information has been assembled by the Geological Survey of Pakistan to allow some initial inferences to be made. In much of the Water Husbandry Area there is a lack of the alternate strata of porous and impermeable materials required to establish functional aquifers. In other areas, including the Gadap Plain, the Khadai and Mol catchment areas, the
Mallir River basin, the Baran River Valley, the Kalu Khuihar, Jhimpir, and Jungshahi areas, the Ranpathani area and the Maleji and Mallir Lakes area, subsols are suitable for the retention of groundwater. If groundwater could be stored in these areas, it could be tapped with tubewells of moderate depth.

483. Due to the rapidity of runoff (because there are presently no impoundments), groundwater sources are scattered and small. The only large groundwater source in the Water Husbandry Area at present is in the Mallir Valley, and it is being depleted due to too high a level of withdrawal. The total capacity of the subsols of areas suitable for groundwater storage is estimated at 3.5 million acre feet (MAF).

484. The main water source (1.77 MAF per year) is from the Indus River. The system begins with the Kaliri-Baghra feeder, which connects the Ghulam Mohammed Barrage on the Indus at Hyderabad with Kaliri Lake. It includes Kaliri Lake, an artificial reservoir with a live storage of 0.49 MAF per year. A series of canals leading from Kaliri Lake provide irrigation for agriculture in the vicinity of Thatta. One of these canals terminates at Dhabej/Gharo, and is utilized for Karachi’s Bulk Water Supply Scheme. From Dhabej/Gharo water is pumped via a series of pressure conduits and canals into Karachi.

4. The water available

485. In an average year the area receives a total of 2.2 MAF precipitation in the two catchment areas. Approximately 0.72 MAF per year are lost due to evaporation.

486. Surface runoff at present is estimated at 0.74 MAF per year. The construction of the Haib Dam will reduce the runoff in the entire Water Husbandry Area to 0.51 MAF per year, and the construction of the Baran Dam plus a number of smaller structures will reduce the runoff to 0.38 MAF per year.

487. Infiltration is 0.74 MAF per year at present. The construction of small watershed improvements and the Baran Dam would increase infiltration to 0.97 MAF per year.

488. In addition to these natural water sources, 1.77 MAF per year are brought into the Water Husbandry Area from the Indus River of which 0.18 MAF per year are presently used for urban water supply, while 1.59 MAF per year are used for irrigation in Thatta District. The volume of water presently brought into the area from the Indus is thus larger than the volume of precipitation minus evaporation.

II. OBJECTIVES

489. The following objectives are recommended for water resources development:
(a) To provide water for both urban and rural development at reasonable standards. The regional water resource development system adopted should make it possible to achieve standards of urban supply somewhere between 40 and 60 gallons per capita per day, for all uses, by 1985. Standards for household consumption in urban areas should be in the vicinity of 20 to 40 gallons per capita per day by 1985. The system should also make it possible to achieve rural residential consumption standards of the order of 15 to 20 gallons per capita per day.

(b) To establish a water technology for the Region that will protect it from seasonal fluctuations in runoff and upstream water use decisions. Pakistan depends largely upon the availability of water from the Indus River. Over the next three decades the water situation will almost certainly become critical and the competition for water will be severe. It is important that the water technology adopted for the Region be as independent of the Indus as possible.

(c) To conserve and enhance the Region's soils and environment. In Chapter IX the need for dramatic changes in the Region's agriculture and (to a lesser extent) afforestation are discussed as a means to provide perishables, meat and dairy products for the population of Karachi. The present arid character of the Region is misleading. There are good soils and they can be developed. At least 700 square miles of new agricultural land could be developed in the Region, increasing regional food production and improving the microclimate. Irrigation water could be provided through the water management system.

(d) To protect urban areas, agricultural areas and other facilities and resources from damage from flooding. Due to lack of vegetation, storm water runoff is rapid, and a storm of even moderate intensity can cause severe flooding in the lower parts of drainage basins. Flooding is particularly destructive in Karachi, where thousands of persons live in riverbeds and nullahs. Regardless of the technology chosen, protection from damage by flooding should be an important objective of water resources development.

C. ALTERNATIVE WATER RESOURCE SYSTEMS

490. Water demand for the Karachi Urban Area is currently estimated at 295 MGD by 1980, and 390 MGD by 1985. It could be as high as 700-1,000 MGD by 2000. If agriculture is expanded to increase the supply of perishable foods, the Karachi agricultural demand could be greatly in excess of present agricultural demand.

491. It was in the face of this tremendous increase in water demand that alternative water resource systems were investigated.

1. The Water Regeneration System

492. A water regeneration system, if feasible, will be the best long-term solution to the problem of water supply.
493. The Water Regeneration System designed in a preliminary form by the project would utilize rising mains and unlined canals to carry waste water from urban areas (after primary or more complete treatment in sewage treatment plants) to agricultural areas, where it would be used for irrigation. This steady flow of waste water from urban areas would percolate through the soil into underground reservoirs thus undergoing final purification and increasing groundwater reserves in the Region.

494. Underground sources would then be used for the supply of water to both urban and agricultural areas. The proposed system also includes the completion of the Habb Dam and a second major impoundment on the Baniyan River to be used for urban water supply. It includes the construction of contour trenches, check dams, dugouts and the implementation of other watershed management techniques in the many small watersheds of the Region, to increase infiltration and decrease runoff. It would conserve scarce water resources. It would help conserve the Region's soils, and would reduce flooding dramatically. Together with agriculture and afforestation, the Water Regeneration System would result in major environmental enhancement. It would provide a stable source of water for the Karachi Region at acceptable standards through the year 2000 and beyond.

495. The key component of the proposed Water Regeneration system is the underground storage capacity of the Water Husbandry Area, currently estimated at 3.5 MAF. If the proposed system of rising mains and canals to carry urban waste waters to agricultural areas are constructed and if watershed management techniques are implemented in small watersheds to increase infiltration, it should be possible to augment groundwater storage to a full 3.5 MAF. This would ensure adequate supplies of water for urban development beyond the year 2000.

496. Over the period 1974-1985 urban waste water collection and treatment systems would have to be upgraded, and rising mains to carry treated waste water into the Region would have to be constructed. The augmentation of groundwater resources would begin as soon as large-scale irrigation is started, perhaps before 1980. It is expected that by 1985 0.36 MAF per year would be returned to underground reservoirs after use for agriculture.

497. Over the period 1985-2000, urban waste water would be used in increasing amounts for irrigation, and it would be possible to begin to draw upon underground reserves, although it would be necessary to maintain the level of withdrawals below the level of recharge to ensure the continued development of underground storage. By 2000 the total underground storage would be approximately 2.7 MAF; by 2015 sufficient water would be available to increase underground storage to 3.9 MAF which would make possible the development of additional underground storage outside the presently proposed Water Husbandry Area.
2. Increased allocations from the Indus

498. Much greater amounts of water could be supplied to Karachi from the Indus, but the increase required by 2000 might amount to as much as 20 per cent of the live capacity of Tarbela Dam. It is doubtful that the pre-emption of this much of the capacity of the dam for one urban region would be advisable unless no other feasible solution exists. It is recommended that the Karachi Region not depend upon additional allocation from the normal flow of the Indus for its water supply, unless the water regeneration system proves to be unfeasible.

3. Storage of the flood water of the Indus

499. Karachi's bulk water supply system is presently based partly upon allocations from the perennial flow of the Indus and partly upon the storage of flood waters from the Indus, both of which are stored in Kalri Lake. It has been advocated that additional artificial lakes be constructed, and that flood waters of the Indus be pumped into these lakes during the two-month flood period to be used for water supply during the entire year. Such a system would have drawbacks. First, evaporation losses might be tremendous (80 inches per year) because additional artificial lakes in suitable locations may have a higher ratio of surface area to total volume than Kalri Lake. Second, large costly pumps would be required to fill such lakes, involving large amounts of foreign exchange and imposing heavy peak loadings on the electrical power system. Finally, the system would be very capital-intensive, employ few persons on a permanent basis and not be conducive to agriculture or the control of flood waters within the Region. Storage of the flood water of the Indus may be the solution to Karachi’s water supply problem if both the Water Regeneration System and increased allocations from the Indus prove unfeasible, but it appears to rank below these two alternatives at present.

4. Desalination

500. Using presently known technologies, the cost of desalination would be approximately Rs.15 per 1,000 gallons, far above the cost of the other water supply technologies described in the section. Desalination plants would involve large amounts of foreign exchange and tremendous capital investment and would generate little employment. New technologies may appear in the future that would make desalination more attractive, but it appears to be the least attractive alternative at this time.

D. THE WATER RESOURCES PROGRAMME 1974-1985

501. Regardless of the eventual water resources technology selected, a number of projects and programmes are recommended for implementation over the period 1974-1980. The most important of these are listed below.
1. Major impoundments

There exist at present two major impoundments in the region — Haleji Lake and Kairi Lake. The Hab Dam is under construction but only Rs. 50 lakhs were allocated for construction in 1972/1973. That allocation should be increased to enable the dam to be completed as rapidly as possible. One additional major impoundment is recommended, the Baran River north of the proposed Damod Dam.

2. Watershed improvements and recharge areas

Small check dams should be constructed in many locations to increase infiltration and reduce runoff. The location of these should be located on the Mol and Khadeji branches of the Mallir River, on the Mallir River between the Superhighway and the National Highway, and on the Lyari River. Contour trenches, check dams, and dugouts should be constructed in small watersheds to increase infiltration and decrease runoff. Major areas of potential recharge improvement should be the Upper Baran Valley and the Mallir River north of the Superhighway.

3. Canals

Only one irrigation project is underway in the Region at present, the Kotri Barrage Irrigation Scheme. Two canals will be constructed to distribute irrigation waters from the Dam. No other major canals are recommended until the feasibility of the proposed water regeneration system is established.

4. Flood control and drainage

There are at present no ongoing flood control projects in the Region. With the proposed impoundments and small watershed improvements, floodwater runoff throughout the Region should be reduced, and flood control channels will be needed in only a few locations. Within Karachi, in particular, several areas will remain subject to flooding until appropriate flood control structures are provided. The worst of these areas is the lower Lyari River Basin. It is recommended that protective embankments and appropriate channel improvements be constructed.

5. Regeneration of sewage effluent

The Gadap Plain to the north of Karachi is the best area in which to initiate agriculture based upon regeneration of sanitary wastes. Approximately 37 MGD could be made available from Treatment Plants 3 and 7 for irrigation in the Gadap Plain by 1986; a total of 95 MGD could be made available from Treatment Plants 2, 3 and 7 by 1985. This would permit the irrigation of 26,000 acres by 1980 and 72,000

1/ This presumes, of course, the physical and economic viability of the Hab Dam project. An independent assessment of its viability was beyond the scope of the present Project.
acres by 1985. The capital cost of these proposals is estimated at Rs.11 crores for the period 1974-1980 and Rs.19 crores for the period 1980-1985. By 1985 an installed pumping demand of 12 MW of electricity will be required. The expected augmentation of groundwater resources in the Malir Basin from this water would be roughly 40 MGD.

6. Regional water resources management

507. There are at present many agencies operating in the field of water resources management in the Karachi Region, including WAPDA, the Irrigation Department of the Government of Sind, KDA, KMC, LKMC, SITA, KPT and others. While each of these agencies may operate efficiently within its own sphere of interest, the present management system creates conflicts of interest between the various authorities and agencies, leaving many aspects of the water resource system unattended.

508. Regardless of the water resource technology chosen, but particularly if the Regeneration System is implemented, consideration must be given to the management of the Region’s water resources.

509. The investigation of ways to manage the Region’s water resources should be co-ordinated with the investigation of the proposed new Metropolitan Water Supply and Environmental Sanitation entity and full consideration should be given to the future role of WAPDA in the Region.

E. IMMEDIATE ACTION

1. The Water Regeneration Feasibility Study

510. A great deal of research and experimentation remains to be done before the configuration of the water resource system is decided upon. It is recommended that a Water Regeneration Feasibility Study be undertaken to assemble more fully information on the climate, soils, geology, geography, and surface and underground water resources of the Region; to investigate the alternative technologies; and to evaluate the costs and potential benefits of alternative systems. A preliminary proposal for such a study has been formulated by the Project staff. It is suggested that such a study be implemented beginning with the 1974/1975 Annual Development Plan in order that the work on the water regeneration system (if feasible) be initiated in time to prevent water shortages in the Region’s urban areas.

2. A Watershed Management and Flood Control Pilot Project

511. It is recommended that a Watershed Management and Flood Control Pilot Project be initiated, to test the techniques for reducing runoff, reducing erosion, and increasing infiltration for the soil types and climate conditions encountered in the Karachi Region.
If agriculture is to be developed in the Region, some form of public management of water resources and their use will be necessary. A Groundwater Recharge and Tubewell Irrigation Pilot Project is proposed to experiment with the public management of water use, either directly by public services or indirectly by public agency control over co-operative societies, depending upon which system is preferred by the Government. Procedures should be developed to monitor and regulate groundwater resources. The Government would plan, finance and construct tubewells and irrigation facilities under either system. If public agencies are to manage the system directly, they would make available water at appropriate rates. If they are to manage the system indirectly through co-operative societies the tubewells and distribution systems would be sold or leased to the co-operative societies at appropriate prices.
Recommendations for regional transport for 1974-1985 were developed jointly by the Karachi Project team and various agencies concerned, based upon the specialized sectoral and project planning of the individual agencies.

A. OBJECTIVES

The objectives for regional transport include the following:

1. To provide for the efficient movement of goods and persons both within the Region and between the Region and other areas, and to do this with a minimum of dislocation of actual and potential urban activities and recognising fully the direct and indirect costs of regional transport on urban activities.

2. To locate facilities so that favourable long-range urban growth patterns are supported.

II. THE PROGRAMME FOR 1974-1989

1. Seaports

The proposal recently adopted to develop Karachi's second port at Sundar Qasim on Phitti Creek is in keeping with the overall metropolitan growth strategy of the Development Plan. This new port site will be an important component of the industrial complex in the Pipli area, including the Steel Mill and other manufacturing activities. It will encourage development on the eastern side of the City and this is desirable from both a metropolitan and a regional point of view. It will allow much of the Region's future goods traffic to be handled without passing through the central urban area.
516. By 1979 the Mundar Qasim port is planned to handle 18 million tons of cargo annually, including 8 million tons of oil. Anchorage and lighterage facilities will be operating by 1975. Its function will be complementary to those of the existing port. It will serve ships up to 50,000 tons handling bulk cargoes of iron ore, coke, cement, foodgrains and petroleum products.

517. Additional capacity is to be developed in the existing port, and master-plan and feasibility studies have been made for the expansion of wharfage facilities. In April 1973 the Government approved a scheme for the development of the first wharfage facilities in the Western Backwaters. Eight cargo berths with a draught of 40 feet are to be constructed by 1978/1979. The cargo capacity of the eight new berths will be of the order of 3 to 4 million tons per annum. It has been indicated by the Karachi Port Trust that this will create employment for about 10,000 persons.

518. Further berths may be constructed in the Western Backwaters as and when required to meet traffic requirements. The year 2000 is the tentative target date for utilizing the capacity of the proposed spur. The spur is planned to contain 26 berths with a total cargo capacity of 10 to 15 million tons per annum, creating employment for approximately 30,000 persons.

519. The transportation system of the City should be developed to provide for the tremendous flow of goods and people generated by both the proposed Mundar Qasim port and the existing port. The most important projects from the standpoint of the existing port are the following:

(a) The completion of the Southern Bypass connecting the East Wharves with the National Highway through the Korangi and Landhi areas, proposed to be constructed in 1977;

(b) The widening of the Mauripur Road, now two-lane, to four lanes by 1975;

(c) The removal of encroachments of a section of Estate Avenue near Shershah and its improvement to a four-lane divided facility by 1975.

520. The widening and improvement of these roads is expected to provide sufficient capacity for the efficient movement of goods and passenger vehicles through 1985.

521. An additional right-of-way for an outer highway through Baldia, Aurangi and North Karachi townships to link with the Superhighway has been reserved and can be built when it is justified by traffic volumes.

522. The completion of the Sewerage Renovation Scheme and Lyari Sewerage Scheme will increase the capacity of the sewerage system and reduce the sewerage load on the storm water system. These measures should reduce the pollution of Karachi Harbour below harmful or objectionable levels.
323. In considering future port expansion beyond the levels already proposed for the existing port and Bundar Qasim, it is important that decisions on where and when to increase capacity take into account not only requirements for sound port operations but also the needs of the entire urban area and the possible impact of port expansion on metropolitan growth.

324. Decisions on Karachi port expansion should take into account expected port traffic volumes, the comparative advantages of the Western Backwaters and Bundar Qasim requirements for port operations and at least the following factors:

(a) The employment likely to be generated by additional port capacity and the location of that employment in relation to existing or potential places of residence for port workers.

(b) The traffic likely to be generated and its impact on the urban area’s transport system.

(c) The loads likely to be generated on the urban area’s water, sewerage and drainage systems.

(d) The potential contribution of additional port capacity to overall metropolitan growth objectives.

325. This is not to suggest that no further expansion should take place in the existing port, for many considerations must enter into such a decision and the Development Plan project team has not been in a position to evaluate all the needs of port operations. It is a reminder, however, and a vital one, that future port decisions, in common with decisions for other urban activities of major importance, should take into account the metropolitan impact of such development.

326. In addition to the technical, economic and metropolitan considerations that should enter into future decisions on port expansion, there is an important organizational question to be considered. Although this is a subject area beyond the terms of reference of the Karachi Project, the importance of an early decision necessitates its mention. Under the initial arrangements for Bundar Qasim the new port area is to be administered separately from the existing Karachi Port. It seems likely that a unified administration would have a number of advantages. It would benefit from the considerable expertise already developed in the Karachi Port Trust. It could encourage economically sound decisions concerning the expansion of each of the port facilities. It should also facilitate economic daily operations of the two installations since up-to-the-minute information on the queuing of ships waiting for berths, available berths and expected turnaround times should be available to and acted upon by a single management unit. Efficient scheduling of port entries and departures, together with the scheduling of related onshore transport, could be greatly facilitated.
2. Air transport

327. The present Karachi Civil Airport will continue as the only international and domestic airport in the Region up to the year 2000. Work on the implementation of the airport development plan, prepared with the collaboration of French consultants, has started. The first phase of construction is expected to be completed by 1977 at a cost of Rs.12.50 crores to cater for passenger and cargo traffic up to 1985. The work includes construction of a new terminal building complex provided with modern facilities for 4 million international and domestic passengers annually, and modification of existing buildings to handle cargo.

328. Beyond 1985, implementation of the second phase to cater for 10 million passengers will begin and a new cargo terminal may be constructed. These facilities should be sufficient for passenger and cargo traffic up to 2000.

329. After that the capacity of the present site may be exceeded and a new airport site in the Region will be required. One possible site for a new airport, south of the Superhighway near Goth Taj Mohammad, could serve Pipri and Kalu Kuhar (a potential site for a major agro-urban complex) as well as Karachi. The Gadap Plain is a second area in which the possibility of siting the new airport should be considered.

3. Railways

530. The railways will continue to play a major part in goods and passenger transport in the Region. The most important proposals for the near future are the Marshalling Yard to be developed at Pipri, the linking of the Steel Mill and the new port at Bundar Qasim with the main rail system, an increase in the capacity of the line from Karachi to Pipri (still under construction) and improvements in rail passenger facilities including expansion and modernization of an existing terminal and improvements to the Karachi Circular Railway.

531. The Pipri Marshalling Yard is currently proposed to be located northeast of Landhi. The project has been sanctioned, the land acquired and some design work done. It is vital that this location be reconsidered urgently. The site proposed is in the main path of urban growth to the east. It would pre-empt 1,833 acres of land that could be used to accommodate approximately 115,000 people at the residential densities proposed for 1985 (assuming that approximately 50 per cent of the 1,833 acres could be available for residential use). If the yard is located in the area proposed originally this population will be forced further to the northeast where building conditions will be more difficult and where the installation and operation of transport facilities, water supply, sewerage and drainage are likely to be more expensive. Workers forced into the northeastern area would also be further from job opportunities in Landhi and the new Steel Mill-Industrial complex at Pipri than they would be in the area proposed originally for the Marshalling Yard. Moreover, dust and other pollution generated by the Yard's activities would be likely to affect directly the population of the new Steel Mill township north of National Highway No.
532. The Karachi Project team has identified and recommended an alternative site for the Yard which is only three to four miles to the east of the original site and south of the main railway line. (See the map Karachi Metropolitan Area Land Use 1980 and 1985 in Chapter VI.) The recommended site has major advantages from the point of view of metropolitan growth and may well be advantageous for the Yard itself. It would allow the Marshalling Yard to serve Port Qasim and the Karachi Steel Mill more easily and efficiently than it could in the original location. It would allow the original site to be developed for normal urban use, facilitating the natural expansion of the Metropolitan Area to the east. Workers resident in the original site area would be close to major concentrations of job opportunities. Households in the area could be provided with transport, water, sanitation and other urban services at low cost. They would also be near the major water, transport, power and communication lines leading into Karachi from the east. The sale of land in the original site for normal urban use could yield public revenues with a discounted value of several crores of rupees. Any pollution generated by the Yard in the recommended site would not interfere with normal urban life since it would affect only an area that is to be left undeveloped in any case because it lies in the likely pollution zone of the Steel Mill. The costs of a shift in location may include, in addition to the funds already spent on preliminary design, any increased construction costs associated with the recommended site (although it is by no means certain that there would be an increase in cost), there may even be a reduction) and the national economic costs of the delay in the completion of the Yard occasioned by the necessary additional survey work and revisions in preliminary designs.

533. The financing of the Yard is being provided in part by the World Bank. There appears to be time to shift to the recommended site provided that the decision to shift is made quickly. The proposal to consider the recommended location was endorsed by the International Advisory Panel and the Policy Advisory Steering Committee for the Karachi Project in February, 1974.

534. What is needed urgently is a cost-benefit analysis of the two locations that will provide a sound basis for a final decision on siting. The argument that any delay will be fatal to the success of the Yard project and that therefore the original site must be retained should not be allowed to cloud the real issue. There are many examples from various parts of the world in which timely changes in decisions of this kind have resulted in major benefits far more important than the internal economics of individual projects considered in isolation. One of the most recent and relevant is the decision to locate the Karachi Steel Mill at Pipri rather than Buleji, a choice that is greatly to the benefit of the entire Metropolitan Area.

535. Rail lines are to be constructed to link the Steel Mill and new port at Bundar Qasim with the main system prior to 1980. The investigation of alternative alignments and reservation of the necessary right-of-way should be carried out as soon as possible, in order to obtain an alignment that is best from the standpoint of the development of the adjoining urban areas as well as providing for efficient railway operations.
536. It may be necessary to expand the capacity of the Karachi-Pipri section of the main line by installing quadruple tracking. This is under consideration and is to be examined in detail by the PWR.

537. As the urban area expands and new employment centres are developed, the passenger traffic on the Karachi Circular Railway (KCR) route will increase substantially. In order to accommodate this increase in urban ridership, it will be necessary to make a series of improvements to the KCR, beginning with improvements in operations, improved signalling and the installation of dead-end tracks to permit two-way services to be provided at reasonable intervals throughout the day. Subsequent improvements provided for in the same 1974-1985 period include double-tracking of the line to handle the increased passenger volume anticipated through 1985. A question that calls for further analysis is whether and when goods movement on the KCR should be abandoned altogether to allow the line to be devoted to passenger traffic, with the goods movement previously handled on the KCR shifted to the main line from Karachi through Pipri in conjunction with increases in the capacity of the main line.

538. PWR will carry out major improvements at Karachi Cantonment station to convert it into a modern long-distance passenger terminal. This will make full use of the facilities already there and will allow Karachi City station to become more efficient as the main terminal for local services. To serve the much larger metropolitan area of the future, consideration should be given to a terminal either at Karachi Central or near the existing station at Drigh Road.

539. Eventually rail connections from Jungshahi to Thatta in the south and Kalu Kuhar in the north may be desirable. Such a link might rejoin the main line in the Badu area. The PWR should monitor development in these areas. A feasibility study should be undertaken if it appears that it would be desirable to stimulate development in these areas and that the traffic could justify a rail line.

540. A rail link to Lasbela has been under discussion, but it appears difficult to justify such a link prior to 1985.

4. Pipelines

541. The existing oil pipeline from Karachi Port to the Korangi refineries will continue to be used intensively and a new pipeline may be laid from Bandar Island in Phatti Creek to the refineries. A new oil farm is likely to be developed in the Pipri area before 1980 to facilitate the movement of oil upcountry.

542. With the development of a major oil refinery in Multan, the feasibility of an oil pipeline from Karachi is to be investigated.

543. The capacity of the existing gas pipeline to Karachi (80 million cubic feet per day) will be further augmented by a second line with a capacity of 130 million cubic feet per day, scheduled to be in operation by 1976, as noted later in Chapter XIII.
5. Regional roads

As development takes place in the Region the network of roads to connect population centres and to provide access outlets from agricultural areas will need to be extended. If the regional water resource development proposals are implemented, the scale of the Region's agricultural activity will increase considerably and rural transport will become increasingly important. In keeping with the capital-servicing emphasis of the overall Development Plan, it is proposed that initially many of these roads should be built to the standards necessary for them to carry low-speed traffic and low volumes of traffic.

6. Regional bus transport

Bus services will continue to connect the larger regional centres to Karachi as they do now, but it is unlikely that services into the smaller agro-centres will be attractive to private operators. Some type of service will be desirable in these cases, and one possible solution would be to combine goods transport and passenger services in minibuses-type vehicles. Even then it might prove necessary to subsidize the passenger side of such services, but this may be sound policy if it encourages development in the Region.

7. Capital costs

The expected capital costs of the major regional transport projects proposed for 1974-1985 are shown in Table VIII.1. The expected costs of rail passenger vehicles and improvements to the Karachi Circular Railway are presented in Chapter XIV because they are for urban transport. Including these, the total costs for PWR are expected to be Rs. 2,186 lakhs. Cost figures for pipelines, regional roads and improvements in the regional bus system are not yet available.

<table>
<thead>
<tr>
<th>Item</th>
<th>Capital cost (Rs. lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ports B</td>
<td>1500</td>
</tr>
<tr>
<td>Airport Improvements C</td>
<td>1250</td>
</tr>
<tr>
<td>Railways D</td>
<td>1020</td>
</tr>
<tr>
<td>Pipri Marshalling Yard</td>
<td>400</td>
</tr>
<tr>
<td>Cantonment Station Improvements E</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16170</td>
</tr>
</tbody>
</table>


Source: Airports Development Authority.

Source: Pakistan Western Railway.

Economic feasibility currently under review.

Foreign exchange components are not yet fully available.
C. IMMEDIATE ACTION

1. Unified administration of the port complex

547. A unified administration for the Sunder Qasim-Karachi Harbour port complex should be considered. Such an administration would benefit from the expertise already developed in the Karachi Port Trust, encourage sound decisions concerning the expansion of each of the port facilities, and facilitate daily operation and scheduling. It would avoid potentially costly competition and duplication of services and facilities. It is recommended that this question be examined at the earliest possible date.

2. Relocation of the Pipri Marshalling Yard

548. A cost-benefit analysis of the relocation of the Pipri Marshalling Yard should be undertaken urgently. A change in the current location could result in shorter journeys to work, lower facilities costs and less pollution. The benefits to the entire urban area are likely to be far more important than the costs of relocation. This study should be undertaken immediately to enable a decision to shift, if that proves desirable, during 1974.

3. Alignment of the rail line to the Steel Mill

549. An investigation of alternative alignments of rail lines to the Steel Mill and the new port at Sunder Qasim should be carried out as soon as possible to enable acquisition of the necessary rights-of-way.

4. Economic feasibility of Cantonment Station improvements

550. The economic feasibility of the proposed Cantonment Station improvements should be investigated thoroughly. Preliminary analysis suggests that the existing Cantonment Station is adequate, with minor improvements, to handle the foreseeable traffic; yet the improvements as currently proposed include major reconstruction and expansion to be undertaken immediately. The total proposed expenditures of Rs.4.0 crores would be more than sufficient to house and provide services for 115,000 persons in two Metroville projects. Consideration should be given to staging the expansion of the Station in accordance with the expected increase in traffic, thereby releasing scarce capital for other, higher-priority projects with greater economic return. Alternative locations at Karachi Central Station and further out on Brigh Road should also be investigated.
CHAPTER IX

AGRICULTURE

A. TRENDS AND ISSUES

551. The proposals for agricultural development in the Region suggested as part of the Karachi Development Plan reflect the concern with imbalances in the supply of essential food items and the consequent adverse effects on consumption standards. There is already a shortage of milk and meat and it is becoming increasingly difficult to obtain fruits and vegetables of good quality.

1. Soils and water

552. Agricultural development in the Region is dependent upon the extent of arable soils and the availability of irrigation water. A preliminary examination has been made of the agricultural potential of the Region in terms of soil capability and water resource availability in order to determine the extent and location of cultivable areas and the type of irrigation to be promoted. The acreage of cultivable soils was assessed and mapped from available data on soil conditions and aerial photographs. The water resource potential was assessed crudely on the basis of existing data from the Geological Survey of Pakistan and a recent groundwater study in the Region.1/

553. The cultivable area of the Region is far more extensive than the present cropped land. The arable soils, classified as Class A (good deep soils more than 30 inches in thickness or with low salinity) and Class B (shallow soils, 15 to 30 inches thick or of moderate salinity), are distributed discontinuously in the flood-plain and valleys.

554. There are two clearly recognizable cultivable areas: 1) the Ghulam Mohammed Barrage Right Bank Command, and 2) the Karachi Plain–Kohistan Mahal section, including the

1/ Zaheeruddin, Panhwar Associates, Groundwater Resources in Karachi Region.
555. In the Gulam Mohammed Barrage Right Bank Command the total cultivable area is 604,000 acres. Under the Gulam Mohammed Barrage Plan of 1959 the ultimate cultivation area was fixed at 454,000 acres. By 1966-1967 the area of annual cultivation developed under the scheme was approximately 281,600 acres. Since then the acreage cultivated annually has dropped considerably because of persistent shortages of irrigation supplies from the Malir Baghar Feeder and increasing salinity.

556. There is a difference of about 172,400 acres between the ultimate cultivable area (fixed at 454,000 acres) and the cultivated area achieved so far. Full cultivation of the balance will be possible when the total command area is developed and the designed irrigation supplies are made available. Since this area is already covered by planned development, the proposals for agricultural development prepared in the Karachi Project relate only to the Karachi Plain-Kohistan Mahal section, which is referred to as the Water Husbandry Area in Chapter VII of this Report.

557. In the Karachi Plain-Kohistan Mahal section, the total cultivable area (Class A and Class B soils) is estimated at about 542,000 acres, of which approximately 472,000 acres are considered capable of being brought under irrigation. The distribution of the cultivable soils is given in Table IX.1, Karachi Region: Cultivable acreage in the Water Husbandry Area.

<table>
<thead>
<tr>
<th>Area</th>
<th>Class A soils</th>
<th>Class B soils</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karachi Plain</td>
<td>99,800</td>
<td>61,600</td>
<td>161,400</td>
</tr>
<tr>
<td>Hub Valley</td>
<td>35,000</td>
<td>13,800</td>
<td>48,800</td>
</tr>
<tr>
<td>Kohistan Mahal</td>
<td>124,800</td>
<td>207,300</td>
<td>332,100</td>
</tr>
<tr>
<td>Valleys</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td>259,600</td>
<td>282,700</td>
<td>542,300</td>
</tr>
</tbody>
</table>

Source: Karachi Planning Project

558. The largest cultivable tracts in the Karachi Plain are Gadap-Konkar and the Malir Valley with 67,000 and 43,000 acres respectively. Intensive vegetable and fruit farming has developed in the Malir Valley with irrigation by wells of over 20,000 acres. Extensive arable areas occur in the valleys of the Kohistan Mahal where the Kalu Khar, lower Kalu (Lyari), Babar Band-Sari Sing, Thano Bula Khan and Baran valleys are covered with alluvial soils, mostly shallow and coarse-grained. There are extensive arable areas in the Hub Valley with the soils on the right bank being roughly twice as extensive as those on the left bank.
Groundwater reserves can be further improved if suitable recharge measures are undertaken. Water regeneration proposals to recharge groundwater reserves are presented in Chapter VII, Water Resources Development. Under this scheme, a mixture of waste water and surface water would be used for irrigation and groundwater development in the Karachi Plain and Hab Valley, while natural surface water and groundwater would be used in the Kalu Khar and Baran basins. In both areas, infiltration of surface water would be increased by the construction of dams and doughts.

2. Current production and consumption

There are at present roughly 30,000 acres under cultivation in the northern Water Husbandry Area of the Karachi Region. They are located primarily in the Karachi Plain and the Hab Valley and produce vegetables, fruits, and fodder. Most production is on perennially irrigated lands watered from wells. Irregular cultivation of fodder on barren lands contributes only slightly to overall production. Grazing occurs on both cultivated and uncultivated lands.

Roughly 70 to 75 per cent of the vegetables, fruits, milk, and meat currently consumed in the Region originates in widely dispersed locations outside the Region; spoilage and other losses are high, transportation costs are substantial, and delivered prices in the Metropolitan Area reflect these conditions.

3. Agencies involved in agriculture

Several agencies are involved in agricultural development in the Karachi Region. Project preparation and implementation are the responsibilities of the Agriculture and Irrigation Departments. The Rural Development Department provides assistance in making available farm inputs to building infrastructure in rural areas. The Water and Power Development Authority (WAPDA), which is an autonomous body, is charged with the execution of water and power development projects, usually of large dimensions. The Hab Dam Project, also known as the Karachi Irrigation Project, is one of WAPDA's schemes. Development of groundwater resources has also been assigned to WAPDA. The use of treated waste water will involve the Karachi Municipal Corporation, the Karachi Development Authority, and the Landhi-Korangi Municipal Committee, which are responsible for the construction and operation of sewerage systems, including treatment plants. Agricultural development schemes based on treated waste water will be prepared and implemented with the active cooperation of these bodies.

B. OBJECTIVES

Two basic objectives are recommended for agriculture.

(a) To expand the production of fruits, vegetables, meats, and milk in the Karachi Region as rapidly as possible to satisfy the consumption requirements of the Region.
(b) To increase the employment opportunities and incomes of the present inhabitants of the Region.

Agricultural production should be expanded as long as these items can be produced and delivered to Karachi from within the Region more efficiently than from outside the Region.

C. THE PROGRAMME FOR 1974-1985

1. Consumption standards

Because incomes are so low for most of the population, the consumption of essential foodstuffs is low and nutrition is often poor. Consumption of essential foodstuffs is expected to rise as per capita incomes increase and it should be possible to improve nutrition considerably by expanding production in the Region. Consumption standards for 1985 are presented in Table IX.2, Karachi Region: Requirements of vegetables, fruits, milk and meat 1984/1985.

Table IX.2

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Per capita standard lbs/year (1984/1985)</th>
<th>Requirements in tons/1,000 inhabitants per year</th>
<th>Total requirements in tons by 1984/1985 (regional pop 7,317 million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables</td>
<td>58</td>
<td>26.55</td>
<td>194,300</td>
</tr>
<tr>
<td>(winter &amp; summer)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruits</td>
<td>41</td>
<td>18.45</td>
<td>135,000</td>
</tr>
<tr>
<td>Milk</td>
<td>142</td>
<td>63.88</td>
<td>467,400</td>
</tr>
<tr>
<td>Meat</td>
<td>33</td>
<td>14.85</td>
<td>108,700</td>
</tr>
</tbody>
</table>


2. An experimental programme

The full potential for agriculture in the Region cannot be determined until a much more rigorous investigation is made of irrigation possibilities. This is proposed as a part of the Water Regeneration Feasibility Study. In the meantime, sufficient information is on hand to justify a limited agricultural development experiment, and this is proposed as an initial step toward a more elaborate scheme. The basic policies underlying this experiment are the following:

(a) Techniques for increasing cropped area and dairy and poultry farming activities will be investigated.
water for irrigation and for providing potable water for rural populations will be tested.

g) The Malir Green Belt will be given specific and urgent attention and will be conserved and protected from encroachments by urban uses.

(g) Techniques for providing effective financial support for tube wells and other agricultural inputs will be tested.


<table>
<thead>
<tr>
<th>Irrigation Source</th>
<th>Area under irrigation</th>
<th>Vegetable/fruits acreage</th>
<th>Fodder acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hab Dam project</td>
<td>21,000</td>
<td>16,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Groundwater in Karachi area</td>
<td>5,000</td>
<td>5,000</td>
<td>-</td>
</tr>
<tr>
<td>Groundwater in Kalu, Khadeji, Jhimpur, Suren areas</td>
<td>5,000</td>
<td>2,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Treated waste water in Karachi area§</td>
<td>10,000</td>
<td>8,000</td>
<td>2,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>41,000</td>
<td>31,000</td>
<td>10,000</td>
</tr>
</tbody>
</table>

Source: Karachi Planning Project

§/ 20 MGD available from the proposed Treatment Plant No. 3.

568. The proposed acreage and the cropping pattern is subject to revision when the feasibility of the Water Regeneration Scheme is determined and when more detailed information about water resources and development possibilities become available. The experimental acreage has been kept purposely low. The proposed acreage is in addition to the existing cropped acreage of about 30,000 acres (5,000 of which will be covered under the Hab Dam Project). Thus, by 1985, the total cropped acreage will reach about 46,000 acres.

569. The expected yield, water requirements and manpower requirements corresponding to this experimental acreage are shown in Table IX.4 and Table IX.5.
<table>
<thead>
<tr>
<th>Commodity</th>
<th>Yield per acre per year 1984/85 (tons)</th>
<th>Water per acre per year 1984/85 (acre-feet)</th>
<th>Acres per worker 1984/85</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables and fruits</td>
<td>6.6</td>
<td>1.69</td>
<td>1.35</td>
</tr>
<tr>
<td>Milk and meat</td>
<td>11.58/</td>
<td>1.94</td>
<td>1.20</td>
</tr>
</tbody>
</table>

Source: Karachi Planning Project

a/ Milk only.

Table IX.5

Karachi Region: Expected experimental yield, water requirements and manpower requirements for experimental agricultural project 1984/85

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables and fruits</td>
<td>31 000</td>
<td>204 600</td>
<td>52 390</td>
<td>23 000</td>
</tr>
<tr>
<td>Milk and meat</td>
<td>10 000</td>
<td>11 150/</td>
<td>19 400</td>
<td>8 000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>41 000</strong></td>
<td><strong>215 750</strong></td>
<td><strong>71 790</strong></td>
<td><strong>31 000</strong></td>
</tr>
</tbody>
</table>

Source: Karachi Planning Project

a/ Milk only.

570. The experimental programme alone will result in the production of approximately 60 per cent of the Region's requirements of fruits and vegetables.

571. The acreage recommended for the experiment is expected to produce job opportunities for 31,000 persons directly. An additional 10,000 would be employed in associated activities and irrigation, for a total of approximately 41,000 jobs. It is recommended that the experiment be implemented in three phases:
Investigation and pilot project stage beginning in 1975 and extending to the end of 1977

572. During this phase groundwater investigations and surveys will be carried out to determine the extent and quality of the groundwater resources, and the locations of tube wells and their command areas. Hydro-geological investigations including resistivity surveys and installation of observation tube wells should be undertaken. Soils surveys for each command area will be carried out to determine its suitability for irrigation and cultivation. Pilot projects based on treated waste water will be established for purposes of experimentation and further development. The proposed investigation may be undertaken as part of the Water Regeneration Feasibility Study. If it is not, it should be co-ordinated with that study.

Development stage beginning in 1978 and extending to 1981

573. During this phase the installation of tube wells, development of command areas and construction of water conveyance systems from treatment plants will be undertaken. It is expected that production will progress gradually in this stage and the farms will come into full production in the following stage.

Production phase from 1982 to 1985

574. During this period efforts will be concentrated on increasing financial support and development of farm management skills with a view to achieving full production.

3. Further agricultural development possibilities for 1974-1985

575. If the water regeneration scheme is fully successful and if groundwater management can be expanded beyond the levels suggested for the experimental agricultural project it may be possible to bring a considerable additional agricultural acreage into production. Treatment Plants 2, 7 and 7 could provide an additional 75 MGD for the Gadap Plain. Treatment Plan 8 could provide approximately 8 MGD to the Buleji-Hawkes Bay area. Treatment Plan 5 could provide approximately 21 MGD to the area already under cultivation in the Malar Green Belt which is presently experiencing problems because of a depletion of groundwater. The additional supplies from Treatment Plants 2, 7 and 8 (Treatment Plant 5 is excluded since it would serve an already cultivated area) could bring into production an additional 41,000 acres, 37,000 in the Gadap Plain and 4,000 at Buleji-Hawkes Bay, for a total of 82,000 acres, as shown in Table 17.6.
Table IX.6
Karachi Region: Possible agricultural acreage and cropping pattern with an expanded agricultural programme

<table>
<thead>
<tr>
<th>Irrigation source</th>
<th>Area under irrigation</th>
<th>Vegetable/fruits acreage</th>
<th>Fodder acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hab river project</td>
<td>21,000</td>
<td>16,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Groundwater in Karachi area</td>
<td>5,000</td>
<td>5,000</td>
<td>-</td>
</tr>
<tr>
<td>Groundwater in Kalu Khar, Khadeji, Jhimpir, Baran areas</td>
<td>5,000</td>
<td>2,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Treated waste water in Karachi area</td>
<td>91,000</td>
<td>33,000</td>
<td>29,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>112,000</td>
<td>54,000</td>
<td>37,000</td>
</tr>
</tbody>
</table>

Source: Karachi Planning Project

576. It is possible that additional acreage could be brought into fodder cropping in the Kalu Khar, Khadeji, Jhimpir and Baran areas, with extended groundwater management but, even neglecting this possibility, the total acreage that may be irrigable by 1985 if the water regeneration scheme is fully successful could provide more than enough vegetables and fruits to serve the regional population by 1985, as shown in Table IX.7.

Table IX.7
Karachi Region: Expected yield, water requirements and manpower requirements with an expanded agricultural programme

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables and fruits</td>
<td>53,000</td>
<td>349.800</td>
<td>31.360</td>
<td>39.300</td>
</tr>
<tr>
<td>Milk and meat</td>
<td>29,000</td>
<td>33.350 g/°</td>
<td>56.260</td>
<td>24.200</td>
</tr>
<tr>
<td>TOTAL</td>
<td>82,000</td>
<td>383.150 g/°</td>
<td>87.620</td>
<td>63.500</td>
</tr>
</tbody>
</table>

Source: Karachi Planning Project

a/ Milk only.
1. A waste water pilot project

A waste water pilot project should be initiated to

with the use of treated waste water for agriculture.

The proposed pilot project would use treated waste water from

Plant No. 3 since it would be the plant closest
good soils in the Gadap Plain. The pilot project

be started now, and scheduled for completion to coincide

the completion of the treatment plant.

A 1,000-acre pilot project would be large enough to

experiments with different crops, irrigation and

ent techniques. Such a project would require approxi-

52 million gallons of water per day.

Preliminary estimates suggest that the capital costs

ing water into the Gadap Plain from Karachi would be

3 crores. This would be the major capital cost item.

of land preparation and the internal irrigation system

crease the total costs to approximately PRs. 0.50

The running costs for the water system would be

imately PRs. 0.038 crores per year.

If this initial project is successful, waste water

Treatment Plants 2 (existing) and 7 (proposed) could be

into the Gadap Plain subsequently.

2. Soils survey and other investigations

Soils surveys should be carried out for each of the

areas within the Water Husbandry Area, starting with

areas with greatest potential for water resource develop-

ent and with soils suitable for agriculture. Other surveys

investigations should be undertaken as necessary for the

development of the programme. Observation tube wells should

installed if they are not installed as part of the Water

Generation Feasibility Study.
A. TRENDS AND ISSUES

Economic growth in Karachi has been fairly rapid, but it has benefited only part of the population. Underemployment is severe, and income is very low for most households. Part of this situation is due to the overall low level of development of Pakistan's economy, the shortages of domestic capital, and the extremely large flows of in-migrants that have joined Karachi in the past. It is also due to an inability to develop markets for the goods and services produced and to use capital and labor efficiently in Karachi.


Forecasted non-agricultural output and employment for the various sectors of the economy were presented in Tables VI.7 and VI.8 respectively. These were based upon an analysis of the international, national and metropolitan demand for goods and services and the locational advantage of Karachi relative to other urban centers in Pakistan. The growth potential analysis of each sector of the economy upon which the growth forecasts in Chapter VI are based is presented below.

1. Large-scale Manufacturing

Existing output and employment in large-scale manufacturing are presented in Table X.1.

Food, beverages and tobacco. These plants produce in excess of local demand at present. However, virtually all primary inputs except fish, some milk and vegetables are brought in from outside the region. Fish processing and canning could contribute to the growth of the industry in Karachi over the long run, but until agriculture is expanded in the region, Karachi will be at a competitive disadvantage for many types of production relative to upcountry producers.
The industry presently is expected to grow in Karachi below the rate for the nation.

586. Textiles. The textile firms in Karachi produce approximately 60 per cent of national output. Most cotton inputs are transported to Karachi from Sind and the Punjab, but some long staple cotton is imported. Even though manufacturers in Karachi are able to obtain cotton at bulk shipment rates from exporters, they are at a disadvantage relative to upcountry producers because they are farther from the areas of cotton production. Transportation costs upcountry for finished goods are not high. A combination of relatively low increases in consumer demand and competition from upcountry plants is expected to limit the potential for growth in Karachi.

587. Footwear and made-up textiles. These are relatively unimportant at present, but the industry is expected to grow fairly rapidly. Karachi is a good location for footwear and clothing production because of the availability of both textiles and leather as well as the presence of the large local market.

588. Wood, furniture and paper products. These industries are also relatively unimportant at present. Consumer demand is expected to rise rapidly, but the lack of raw materials will limit the expansion of the industry in Karachi.

589. Printing and publishing. The printing and publishing firms in Karachi produce approximately 71 per cent of national output. Most paper is either imported or shipped into Karachi from upcountry. Upcountry locations would presumably be advantageous if domestic production of paper were expanded. For the middle-range future, however, manufacturers are expected to take advantage of Karachi's skilled labour force and large market, and the industry should grow fairly rapidly.

590. Leather. Leather manufacturing in Karachi amounts to 44 per cent of national output. Output and employment in Karachi are expected to increase at approximately the same rate as for the nation.

591. Rubber and chemicals. The production of rubber products is expected to increase rapidly, as is the production of most chemicals except fertilizers. The enlargement of petrochemicals and installation of a naphtha cracker should stimulate the development of both rubber and chemicals.

592. Petrochemicals. The production of petrochemicals is concentrated at present in Karachi (two oil refineries based on imported oil) and Rawalpindi (one small refinery based on domestic oil). In the Fourth Five-Year Plan it was proposed that the existing capacity of Karachi be enlarged and that a naphtha cracker be installed. This will make Karachi a very good location for the production of plastics and synthetic fibres.

593. Non-metallic minerals. These include many glass plants and several cement plants. The production of cement is currently less than the level of consumption. Demand for non-metallic minerals will expand very rapidly as city-building accelerates. There are many deposits of limestone and silica sand in the Region, and the Steel Mill is expected to produce slag that could be used in the production of cement. Both output and employment are expected to increase very rapidly.
<table>
<thead>
<tr>
<th>Industrial group</th>
<th>Gross value added per employee (in rupees) 1967/1968</th>
<th>Employment on 31 December 1967</th>
<th>Per cent of total employment in Karachi District</th>
<th>Per cent of sectoral employment in West Pakistan</th>
<th>Gross value added (including indirect taxes, in thousands of rupees) 1967/1968</th>
<th>Per cent of total output in Karachi District</th>
<th>Per cent of sectoral output in West Pakistan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>12,800</td>
<td>6,530</td>
<td>4.6</td>
<td>18.4</td>
<td>83,356</td>
<td>5.4</td>
<td>17.7</td>
</tr>
<tr>
<td>Beverages</td>
<td>11,200</td>
<td>4,099</td>
<td>0.3</td>
<td>30.9</td>
<td>4,584</td>
<td>0.3</td>
<td>15.0</td>
</tr>
<tr>
<td>Tobacco</td>
<td>5,960</td>
<td>3,154</td>
<td>2.2</td>
<td>38.9</td>
<td>482,781</td>
<td>31.2</td>
<td>45.9</td>
</tr>
<tr>
<td>Textiles</td>
<td>6,960</td>
<td>6,924</td>
<td>48.6</td>
<td>37.5</td>
<td>10,837</td>
<td>0.7</td>
<td>26.1</td>
</tr>
<tr>
<td>Footwear &amp; made-up textiles</td>
<td>6,810</td>
<td>1,485</td>
<td>1.0</td>
<td>20.7</td>
<td>964</td>
<td>0.1</td>
<td>19.6</td>
</tr>
<tr>
<td>Wood (excluding furniture)</td>
<td>6,340</td>
<td>1,522</td>
<td>0.1</td>
<td>13.5</td>
<td>1,064</td>
<td>0.3</td>
<td>19.6</td>
</tr>
<tr>
<td>Furniture &amp; fixtures</td>
<td>4,810</td>
<td>866</td>
<td>0.6</td>
<td>55.1</td>
<td>4,460</td>
<td>1.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Paper &amp; paper products</td>
<td>3,150</td>
<td>3,150</td>
<td>0.1</td>
<td>3.8</td>
<td>42,968</td>
<td>2.8</td>
<td>71.2</td>
</tr>
<tr>
<td>Printing &amp; publishing</td>
<td>8,220</td>
<td>2,103</td>
<td>3.6</td>
<td>65.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leather &amp; leather products</td>
<td>13,850</td>
<td>1,286</td>
<td>0.9</td>
<td>31.3</td>
<td>17,018</td>
<td>1.2</td>
<td>44.0</td>
</tr>
<tr>
<td>Rubber &amp; leather products (excluding footwear)</td>
<td>21,300</td>
<td>1,887</td>
<td>0.3</td>
<td>73.9</td>
<td>40,135</td>
<td>2.6</td>
<td>94.7</td>
</tr>
<tr>
<td>Chemicals</td>
<td>18,800</td>
<td>10,739</td>
<td>7.3</td>
<td>42.3</td>
<td>200,920</td>
<td>13.0</td>
<td>47.9</td>
</tr>
<tr>
<td>Products of petroleum and coal</td>
<td>129,000</td>
<td>6,472</td>
<td>0.5</td>
<td>27.4</td>
<td>83,821</td>
<td>5.4</td>
<td>35.2</td>
</tr>
<tr>
<td>Non-metallic mineral products</td>
<td>5,550</td>
<td>3,275</td>
<td>2.3</td>
<td>21.7</td>
<td>18,189</td>
<td>1.2</td>
<td>8.8</td>
</tr>
<tr>
<td>Basic metals</td>
<td>12,700</td>
<td>3,606</td>
<td>2.5</td>
<td>43.2</td>
<td>45,920</td>
<td>3.0</td>
<td>46.4</td>
</tr>
<tr>
<td>Metal products (excluding machinery)</td>
<td>6,200</td>
<td>6,866</td>
<td>4.8</td>
<td>62.2</td>
<td>42,513</td>
<td>2.8</td>
<td>54.2</td>
</tr>
<tr>
<td>Machinery</td>
<td>6,000</td>
<td>1,948</td>
<td>1.3</td>
<td>16.4</td>
<td>11,673</td>
<td>0.7</td>
<td>22.2</td>
</tr>
<tr>
<td>Electrical machinery</td>
<td>18,600</td>
<td>3,794</td>
<td>2.7</td>
<td>21.9</td>
<td>70,208</td>
<td>6.5</td>
<td>40.6</td>
</tr>
<tr>
<td>Transport equipment</td>
<td>8,940</td>
<td>10,342</td>
<td>7.3</td>
<td>59.5</td>
<td>91,289</td>
<td>3.9</td>
<td>72.1</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>6,130</td>
<td>4,651</td>
<td>3.3</td>
<td>18.8</td>
<td>29,520</td>
<td>1.8</td>
<td>15.3</td>
</tr>
<tr>
<td>Other</td>
<td>12,800</td>
<td>6,219</td>
<td>4.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>11,140</td>
<td>142,352</td>
<td>100.0</td>
<td>37.5</td>
<td>1,346,752</td>
<td>100.0</td>
<td>42.8</td>
</tr>
</tbody>
</table>

594. The Steel Mill. Construction plans are now under way for the establishment of the first steel mill in Pakistan, to be located in Karachi at Pipri and using imported iron ore and coal. It will have an initial capacity of approximately 1 million tons annually and will employ approximately 10,000 workers. There are other possible locations for the establishment of steel plants, at Kalabagh and Chilgazi, but the Karachi plant will dominate the market for years to come. It should also make Karachi a more attractive location for other basic metals and metal products.

595. Other basic metals. There are at present several steel re-rolling mills in the area and a steel alloy plant is under construction in the Valika complex. After the establishment of the Steel Mill, production of metal products will increase very rapidly, as will other basic metals. An aluminium re-rolling mill using imported aluminium may be established in Karachi also.

596. Metal products and machinery. Karachi contains the largest complex of metal products and machinery manufacturers in Pakistan with an employment of 10,700 persons. Metal products plants depend upon Karachi's re-rolling mills and imported metals for their basic inputs. After the construction of the Steel Mill, Karachi will become an even more desirable location for metal products than it is at present. The establishment of the heavy machinery complex at Taxila will pre-empt some growth that might have occurred in Karachi, but expansion will still be very rapid.

(b) Small-scale manufacturing

597. Output and employment estimated in a survey of small-scale manufacturing in Karachi are shown in Table K.2. It should be kept in mind that actual employment and output are much greater. The figures shown indicate the relative importance of each item and provide a crude basis for comparison with large-scale manufacturing.

598. Food. The production of food includes small flour mills, fodder mulching, bakeries, vegetable oils and similar items. Production is primarily for the local market. The group is expected to grow at roughly the same rate as large-scale manufacturing.

599. Textiles. Textile production includes handloom goods, machine-produced goods using small mills, carpets, embroidery and similar items. Production is for both the domestic market and export. The group is expected to grow more rapidly than large-scale manufacturing. Many firms in this group can be expected to increase in size if they are supported by public policy.

600. Footwear and clothing. Output in small-scale footwear and clothing manufacturing is greater at present than in large-scale footwear and clothing manufacturing. The industry is expected to grow fairly rapidly in response to local demand. The better firms may be able to expand and become exporters if quality can be maintained and styles kept current.

601. Wood, furniture and paper products. These also have a greater output than large-scale manufacturing. As with large-scale manufacturing, the lack of raw materials will
<table>
<thead>
<tr>
<th>Industrial group</th>
<th>Value added per employee (rupees) 1966/1967</th>
<th>Employment 1966/1967</th>
<th>Per cent of total</th>
<th>Value added (thousands of rupees)</th>
<th>Per cent of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>4030</td>
<td>3913</td>
<td>5.8</td>
<td>15,781</td>
<td>8.9</td>
</tr>
<tr>
<td>Beverages</td>
<td>5,750</td>
<td>82</td>
<td>0.1</td>
<td>471</td>
<td>0.3</td>
</tr>
<tr>
<td>Tobacco</td>
<td>420</td>
<td>811</td>
<td>7.1</td>
<td>2017</td>
<td>1.1</td>
</tr>
<tr>
<td>Textiles</td>
<td>2,500</td>
<td>13,354</td>
<td>19.7</td>
<td>33,494</td>
<td>18.6</td>
</tr>
<tr>
<td>Footwear and clothing</td>
<td>2,850</td>
<td>303</td>
<td>12.2</td>
<td>23,685</td>
<td>13.1</td>
</tr>
<tr>
<td>Wood</td>
<td>700</td>
<td>971</td>
<td>4.4</td>
<td>2,063</td>
<td>1.1</td>
</tr>
<tr>
<td>Furniture</td>
<td>2,930</td>
<td>410</td>
<td>5.0</td>
<td>10,000</td>
<td>5.6</td>
</tr>
<tr>
<td>Paper</td>
<td>1,990</td>
<td>1200</td>
<td>1.8</td>
<td>2,389</td>
<td>1.3</td>
</tr>
<tr>
<td>Printing</td>
<td>3390</td>
<td>3,742</td>
<td>5.5</td>
<td>12,705</td>
<td>7.0</td>
</tr>
<tr>
<td>Leather products</td>
<td>4,200</td>
<td>1,862</td>
<td>2.7</td>
<td>7,840</td>
<td>4.4</td>
</tr>
<tr>
<td>Rubber</td>
<td>2,260</td>
<td>269</td>
<td>0.4</td>
<td>609</td>
<td>0.3</td>
</tr>
<tr>
<td>Chemicals</td>
<td>4,270</td>
<td>1,976</td>
<td>2.9</td>
<td>8,091</td>
<td>4.6</td>
</tr>
<tr>
<td>Products of petroleum and coal</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Non-metallic mineral products</td>
<td>2,350</td>
<td>1,924</td>
<td>2.8</td>
<td>4,505</td>
<td>2.5</td>
</tr>
<tr>
<td>Basic metals</td>
<td>8,200</td>
<td>734</td>
<td>1.1</td>
<td>6,013</td>
<td>3.3</td>
</tr>
<tr>
<td>Metal products</td>
<td>3,150</td>
<td>6,048</td>
<td>8.9</td>
<td>19,071</td>
<td>10.6</td>
</tr>
<tr>
<td>Machinery</td>
<td>3,170</td>
<td>3,087</td>
<td>4.6</td>
<td>9,800</td>
<td>5.4</td>
</tr>
<tr>
<td>Electrical machinery</td>
<td>3,420</td>
<td>297</td>
<td>1.9</td>
<td>4,417</td>
<td>2.4</td>
</tr>
<tr>
<td>Transport equipment</td>
<td>1,380</td>
<td>706</td>
<td>5.5</td>
<td>5,134</td>
<td>2.8</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2,400</td>
<td>1,400</td>
<td>7.6</td>
<td>12,328</td>
<td>6.8</td>
</tr>
</tbody>
</table>

**TOTAL**                                | 59,760                                     | 67,829               | 100.0            | 180,414                           | 100.0            |

limit the expansion of the industry in Karachi, but small-
scale manufacturing should grow more rapidly than large-
scale manufacturing in response to local demand.

602. Printing and publishing. Small-scale manufacturing
is expected to expand more rapidly than large-scale manu-
factoring in the same sector as the business demand for small
firms' services expands.

603. Leather products. These are currently manufactured
for export in Karachi. The opportunities for expansion should
be great, but the lack of raw materials may put Karachi at a
competitive disadvantage relative to upcountry locations.
The industry is expected to expand more rapidly than large-
scale manufacturing in the same industry.

604. Chemicals. The small-scale chemicals industry is
important at present. The industry is subject to economies
of scale, however, and small-scale manufacturing should gradu-
ally lose ground to large-scale manufacturing for this reason.

605. Non-metallic minerals. This industry includes pottery,
glassware and concrete blocks. Small-scale manufacturing
should expand rapidly as construction activity in Karachi
increases. Over the very long run it will be forced out by
large-scale manufacturing, but it may increase its share of
the market over the short- and middle-term future.

606. Basic metals. The small-scale basic metals industry
is expected to expand less rapidly than large-scale manufac-
turing in the same industry.

607. Metal products and machinery. Small-scale metal
products and machinery includes fabrication of component parts
for large-scale manufacturers, motor vehicle repair, manufac-
ture of component parts for kerosene stoves, manufacture of
simple electrical machinery and similar items. It is expected
to increase as rapidly as or more rapidly than large-scale
metal products and machinery manufacturing.

(c) Construction

608. The construction sector includes a few large firms
with heavy equipment engaged in large-scale civil works, a
number of construction companies with light equipment engaged
primarily in housing and other smaller works and a large
number of firms in the traditional sector. It is proposed
in Chapter XI that an agency be established to finance construc-
tion activity. The housing, land development and utilities
proposals described in other chapters are expected to result
in a rapid increase in construction output in the Metropolitan
Area. The sector should be encouraged to remain labour-
intensive and will be a major source of employment.

(d) Public utilities

609. These include water supply, sewerage, drainage and
solid waste disposal systems, electricity and gas and commu-
nications. This sector is expected to increase rapidly in
output and employment.
Trade

Karachi contains most of Pakistan's importers and exporters as well as a large number of firms serving markets throughout Pakistan. It is the predominant retail trade centre of the lower Sind area. Wholesale trade is expected to maintain its share of total output and employment in Karachi, while the share of retail trade is expected to decrease. This trend is expected to continue over the middle-term future as manufacturing and other economic activities increase in importance.

Finance and real estate

Karachi contains the head offices of most banks and insurance companies and houses the only currently functional exchange in Pakistan. The sector is expected to maintain its share of output in Karachi and to increase its share of employment slightly.

Transportation

The transportation sector includes the Karachi Port, Karachi Airport, the Pakistan Western Railway, a large number of bus companies, a tram company, taxicabs, motor rickshaws, minibuses, trucking companies, horse-drawn "tongas" and donkey and camel carts. Except for the modern port, airport and railway, the sector is dominated by small firms, including individual operators. As income rises, the demand for urban passenger transport will increase rapidly. This will be offset by the more efficient physical layout proposed for the urban area. The result is that the share of transport in both output and employment is expected to decrease moderately.

Services

These include hotels, cinemas, the postal service, law firms, accounting, engineering and architecture, restaurants, laundries and a wide range of other activities. The share of the sector in both output and employment is expected to decrease moderately. This trend is expected to continue over the middle-term future as manufacturing and other economic activities increase in importance.

2. The need for expansion of overseas markets

Overall, firms in Karachi have been quite successful in penetrating domestic markets. In textiles, printing and publishing and several other industries they have established large market areas even though they apparently have had to overcome transportation-cost disadvantages. In many industries the disadvantages created by the higher wage rates prevailing in Karachi are less than the advantages of Karachi's industrial services and facilities, business services, trading organisations, communications and transportation facilities. The city is presently the most efficient location in Pakistan for many kinds of manufacturing, including rubber, some kinds of chemicals, petrochemicals, steel, other basic metals and many kinds of metal products. It is expected that the establishment of the Steel Mill and expansion of the petrochemicals complex in Karachi will reinforce the situation and result in a continuation of Karachi's role as the nation's largest industrial centre.
615. The economic growth of the City will be constrained by that of the national economy, however, unless Karachi is able to exploit its location and facilities further to expand its export manufacturing.

616. Karachi has the potential to become one of the great export manufacturing centres of Asia. It has a very large and relatively low-cost labour force. It has reliable services and facilities in the industrial areas, including natural gas. It has the business services and trading organizations necessary to support manufacturing for overseas markets. There is a modern harbour and an airport for international goods shipments and passenger transport. Communications both within the City and with other nations are good. A number of factors including poor municipal management have combined to prevent the expansion of export manufacturing in Karachi. If these can be overcome and steps are taken to encourage firms to locate in Karachi it could become the largest centre for export manufacturing on the Subcontinent. The result would be an increase in national output, an improvement in the balance of trade and an increase in employment and incomes for the population of Karachi.

617. One way to encourage export manufacturing is by the establishment of a free port in Karachi. (A free trade zone is an industrial area in which goods may be imported and exported free of duty. Duty is paid only on goods that are sold for domestic consumption.) Free trade zones have been established in many of the developing countries. Karachi's large and low-cost labour force, reliable services, harbour and airport facilities and business support services make the City an excellent location for a free trade zone and for export manufacturing. If one were established in Karachi it would result in a more rapid rate of economic and employment growth than otherwise would be possible because it would make available capital and managerial resources that are in short supply and access to markets that are currently inaccessible in Pakistan.

618. The advantage to Pakistan of a free trade zone is that it would result in increased employment opportunities and incomes for the population of Karachi and increased output for the economy as a whole. The disadvantage is that it will result in a loss of public tax revenue from the firms that locate in the zone and that would have been in Karachi regardless of the existence of the zone. Some firms producing primarily for the local market may find it less costly to pay duty on the finished product than on the materials and locate in the zone for this reason. Before a decision on the establishment of a free zone is finalized there should be a thorough analysis of the employment it is expected to generate and the other changes expected to be associated with it. Among other things, care should be taken not to subsidize enterprises which would have located in Karachi even if the zone were not established.

3. The need for employment creation and support for small firms

619. The economic, financial and foreign trade policies of the past have resulted in heavy reliance upon Western technologies and the creation of large firms in Karachi.
Some of these are currently underutilized because their markets are too small. Many use technologies that are overly sophisticated and that make them dependent upon overseas suppliers and result in high foreign exchange costs. Large firms are more capital-intensive than small firms and do not labour as efficiently. The result of lack of support for small firms is a loss in potential output, widespread unemployment and low incomes for most households, while a few enjoy very high incomes and a high standard of living.

Small firms in Karachi face a number of problems. There is a lack of opportunity for expansion created by an oversupply of capacity relative to demand in some products. Only a few small firms are able to obtain loans from commercial banks; most are forced to rely upon relatives or friends for investment capital. Small entrepreneurs may be at a disadvantage in dealing with the bureaucracy and in obtaining investment and other sanctions. The technicians are often very skilled in solving production problems, but they find it difficult to maintain quality control and are often unaware of better production techniques. Few small businessmen have had training in management.

Transportation firms may be forced out of operation by land use planning which makes their operation uneconomic by traffic regulations which prohibit or make difficult their location.

Small firms are at present often forced to locate on unauthorized land without water supply, sewerage or drainage.

A comparison of the characteristics of various sizes of firms for the textiles, light engineering, plastics and other industries in Karachi is presented in Table X.3. The table indicates that in all cases small firms (0-9 workers) are much less capital-intensive than large firms. Interestingly, the degree of capital intensity for textiles, light engineering and plastics increases not in a straight line, but in an "S"-shaped curve. The initial increase in capital intensity over the range 10-19 and 10-49 workers may indicate heavy capitalization of new, small firms that is later reduced as the firms expand their operations.

Research on production functions and wage rates for various sizes of firms in the textiles, light engineering, leather and plastics industries has revealed some interesting characteristics of economic production in Karachi.

Table X.1
Karachi Metropolitan Area: economic characteristics by size of firm, 1957

<table>
<thead>
<tr>
<th>Industry by number of workers</th>
<th>Rupees</th>
<th>Per cent</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Capital per worker</td>
<td>Output per worker</td>
<td>Capital per output</td>
</tr>
<tr>
<td><strong>Textiles</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-9</td>
<td>887</td>
<td>1 406</td>
<td>63.0</td>
</tr>
<tr>
<td>10-19</td>
<td>9 237</td>
<td>3 124</td>
<td>296.0</td>
</tr>
<tr>
<td>20-49</td>
<td>8 653</td>
<td>2 420</td>
<td>367.0</td>
</tr>
<tr>
<td>50-99</td>
<td>9 514</td>
<td>3 421</td>
<td>278.0</td>
</tr>
<tr>
<td>100 up</td>
<td>8 708</td>
<td>2 509</td>
<td>347.0</td>
</tr>
<tr>
<td>Total</td>
<td>8 656</td>
<td>2 519</td>
<td>344.0</td>
</tr>
<tr>
<td><strong>Light Engineering</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-9</td>
<td>2 491</td>
<td>2 564</td>
<td>97.0</td>
</tr>
<tr>
<td>10-19</td>
<td>5 841</td>
<td>1 596</td>
<td>365.0</td>
</tr>
<tr>
<td>20-49</td>
<td>8 061</td>
<td>3 114</td>
<td>259.0</td>
</tr>
<tr>
<td>50-99</td>
<td>7 214</td>
<td>3 023</td>
<td>239.0</td>
</tr>
<tr>
<td>100 up</td>
<td>16 121</td>
<td>3 208</td>
<td>502.0</td>
</tr>
<tr>
<td>Total</td>
<td>11 266</td>
<td>3 029</td>
<td>372.0</td>
</tr>
<tr>
<td><strong>Plastics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-9</td>
<td>7 845</td>
<td>5 786</td>
<td>135.0</td>
</tr>
<tr>
<td>10-19</td>
<td>4 669</td>
<td>1 047</td>
<td>426.0</td>
</tr>
<tr>
<td>20-49</td>
<td>10 259</td>
<td>2 712</td>
<td>378.0</td>
</tr>
<tr>
<td>50-99</td>
<td>19 039</td>
<td>3 792</td>
<td>501.0</td>
</tr>
<tr>
<td>100 up</td>
<td>4 813</td>
<td>2 129</td>
<td>226.0</td>
</tr>
<tr>
<td>Total</td>
<td>8 442</td>
<td>2 451</td>
<td>345.0</td>
</tr>
<tr>
<td><strong>Leather and leather goods</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-9</td>
<td>824</td>
<td>2 487</td>
<td>34.0</td>
</tr>
<tr>
<td>10-19</td>
<td>1 533</td>
<td>2 063</td>
<td>74.0</td>
</tr>
<tr>
<td>20-49</td>
<td>3 805</td>
<td>2 539</td>
<td>150.0</td>
</tr>
<tr>
<td>50-99</td>
<td>2 707</td>
<td>3 388</td>
<td>80.0</td>
</tr>
<tr>
<td>100 up</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3 063</td>
<td>2 733</td>
<td>112.0</td>
</tr>
<tr>
<td><strong>All industries</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-9</td>
<td>1 964</td>
<td>2 269</td>
<td>87.0</td>
</tr>
<tr>
<td>10-19</td>
<td>6 018</td>
<td>1 964</td>
<td>306.0</td>
</tr>
<tr>
<td>20-49</td>
<td>7 414</td>
<td>2 708</td>
<td>274.0</td>
</tr>
<tr>
<td>50-99</td>
<td>7 693</td>
<td>3 209</td>
<td>240.0</td>
</tr>
<tr>
<td>100 up</td>
<td>9 265</td>
<td>2 562</td>
<td>362.0</td>
</tr>
<tr>
<td>Total</td>
<td>8 868</td>
<td>2 591</td>
<td>342.0</td>
</tr>
</tbody>
</table>


625. First, the research indicates that there is an increase in wage rates with the size of the firm, as shown in Table X.4.

626. Wage rates that are above the marginal productivity of labour are paid by large firms because they are subject to collective bargaining and strikes by labour groups and regulated by labour legislation. This means that there is
Table X.4
Karachi Metropolitan Area: wage rates by size of firm, 1957

<table>
<thead>
<tr>
<th>Number of workers</th>
<th>Average hourly wage (PRs.)</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>.53</td>
<td>58</td>
</tr>
<tr>
<td>10-19</td>
<td>.69</td>
<td>76</td>
</tr>
<tr>
<td>20-49</td>
<td>.81</td>
<td>99</td>
</tr>
<tr>
<td>50-99</td>
<td>.87</td>
<td>96</td>
</tr>
<tr>
<td>100 and over</td>
<td>.91</td>
<td>100</td>
</tr>
</tbody>
</table>


An overvaluation of labour in the large-scale firms that results in an inefficient use of capital and labour and loss of potential output, as well as contributing to the unemployment problem in Karachi today.

627. It also means that institutional barriers to the growth of small firms have been created — the firms must remain small if they are to avoid paying higher wage rates.

628. The research indicates that, if wage rates were equal for all firms, returns to scale would be constant for the textiles and light engineering industries and diminishing for the leather and plastics industries. If this were the case there would be, in general, no reason on efficiency grounds to favour any particular size of firm and firms of all sizes should be able to operate on a competitive basis in Karachi.

629. The situation described above does not necessarily support the argument that small firms should be supported. It does, however, illustrate the importance of taking action to reduce the economic effects of imperfections in the labour markets faced by large firms and to increase the opportunities for expansion and growth that are available to small firms, if the growth of small firms is an objective of public policy.

630. The strongest arguments for support for small firms are concerned not with efficiency over the short run but with equity, the dynamics of development and efficiency over the long run. Small firms require much less capital per unit of output than large firms and they use marginal labour more efficiently. They provide a path of upward mobility for both the owners and the employees of the firms. Support for small firms should result in an increase in employment and in increased incomes for the lower-income groups.

631. Support for small firms should result also in an increased rate of innovation of new products and production processes suited to the supply of capital, labour and material inputs in Pakistan. Innovation occurs when persons
with new ideas are able to establish a foothold in the economy with a small firm and then develop the product and expand the firm. Large metropolitan areas are ideal for this process – the business and other support services needed by a small firm are in place, production space is readily available, flows of information on business opportunities are intense and materials and equipment are easily obtained.

632. All of these conditions are present in Karachi. Firms will grow, develop and contribute to the City's economic growth if the present barriers to their growth are removed if they are supported by public policy.

633. Proposals for financial and technical support for firms and the location of small firms are presented later in this chapter.

4. Location and land development

(a) Industrial areas

634. There are at present six major industrial areas in Karachi: the West Wharf/Keamari area; the Sind Industrial Trading Estate; the Landhi Industrial Trading Estate; the Korangi Industrial Area; Dhaubeji/Gharo; and the Valika complex. There are in addition to these a number of small industrial areas: one along Lawrence Road; one at the junction of Drigh Road and Korangi Road; one in Mansoora; one adjacent to Model Colony; one in Drigh Colony; and one in Korangi. In addition to these there are concentrations of small-scale manufacturing in the Old Town, Golimar and Liaquatabad.

635. The Korangi-Landhi-Pipri-Dhaubeji/Gharo belt already contains Karachi's two oil refineries and will soon contain the Steel Mill. Because there is water in adequate quantities for cooling and rail transport in these areas and because of the location of the oil refineries and Steel Mill there, they will become an axis of heavy industry. Most of the petrochemicals complex and much of the metal-working industry will locate there.

636. As the economy expands a larger proportion of firms will have strong intra-urban locational requirements. The Steel Mill must be located near the port and sources of water for cooling. Part of the metal-working industry and possibly cement will be located near it. Petrochemicals and many chemical plants must be located in the Korangi-Pipri-Dhaubeji/Gharo belt. Many other plants will require rail services and large quantities of water and power as well.

(b) Wholesaling centres

638. Fruits and vegetables wholesaling was located until recently near Boulton Market, in the Old Town. A new wholesaling centre has been constructed at Subzi Mandi on University Road, and this has reduced the congestion of the Old Town area considerably. However, many fruits and vegetables wholesalers remain in the Old Town area – in many cases because they have obtained their quarters under the pujree system and are at present paying extremely low rent. Field survey work indicates that fruit and vegetables retailers in Korangi may pay as much as 8 per cent of the cost of their
lareas for a minibus to transport them from Subzi Mandi to Korangi, and the octroi duty would make this percentage even higher. Already, a sub-metropolitan grain and flour wholesaling market exists in Korangi.

343. Cloth, clothing and footwear wholesaling is concentrated at present on Bunder Road in the vicinity of Boulton Market, from which point wholesalers have good accessibility to both the city’s textile manufacturers and cloth retailers. No shift in the location of this market is expected within the Karachi Urban Area up to 1985.

344. Appliances and automotive equipment wholesalers are located at present chiefly on Bunder Road at its intersection with Victoria Road. It is important for automotive wholesalers to be located near repairmen, and development could be expected in sub-metropolitan centres serving high-income markets for this reason.

345. Household and personal effects wholesalers are located at present on Bunder Road adjacent to Boulton Market. No shift in the location of this market within the Karachi Urban Area is expected up to 1985.

346. Firewood and wood wholesaling is currently located near Nazir Mansion. Wood is transported into Karachi chiefly by rail, so a location on the rail line is important. Land is extremely valuable in the vicinity of Nazir Mansion, however, and this suggests that a new site is desirable. Coal wholesaling is currently located in Lyari. Transportation through Lyari is rather difficult. A new site is desirable.

347. Cotton wholesaling is currently located near the Thal Produce Yard, while leather is located in Lyari. Although land values are high in the TPX area, the location of cotton close to the Port and government offices is very desirable. Leather wholesaling might, however, be relocated, if it is done in conjunction with the relocation of the slaughterhouse.

348. Commercial centres

349. There exists in Karachi a four-level hierarchy of commercial centres: "metropolitan" centres, "sub-metropolitan" centres, "township" centres and "local" centres.

350. The four-level hierarchy of commercial centres is created by the overlapping of what would otherwise be two three-level hierarchies, one with large, widely spaced centres created by high-income groups (Rs.1,000 per month and more) with fairly infrequent shopping trips and willing to travel fairly long distances to shop and one with small, more closely spaced centres created by middle-income and low-income groups (Rs.0-999 per month) with very frequent shopping trips and unwilling to travel long distances except on rare occasions. Low-income groups do most of their shopping in local, township, and sub-metropolitan centres, while high-income groups do most of their shopping in local, township, and metropolitan centres. There may be an almost complete overlapping of market areas: high-income groups in Nazimabad seldom, if ever, shop in Liaquatabad, even though many items such as cloth and shoes are cheaper there than they are in Bohri Bazaar, probably because Liaquatabad does not offer a sufficient range of other goods to compete with Bohri Bazaar
for the expenditures of high-income groups. On the other hand, middle-income and low-income groups apparently are able to do most of their shopping in Liaquatabad, and most shop in Rohri Bazaar only for a few items, mostly durables, not found in sufficient quantity in Liaquatabad, such as wristwatches, radios, bicycles or eyeglasses.

646. It is expected that the four-level hierarchy of commercial centres will continue to be viable through at least 1985. The recommendations for commercial development made later in this chapter are designed to reinforce the development of such a hierarchy.

647. There is at present one metropolitan centre in Karachi. It encompasses the financial centre on Chundrigar Road, and the commercial areas in the Old Town and Saddar.

648. The Old Town area, in one of the oldest sections of Karachi, is in place poorly served with transportation facilities. It contains a great deal of small-scale manufacturing and offers some specialized goods and services not found in Saddar. It is patronized by all income groups.

649. The Saddar area is well served with transportation facilities. It is patronized primarily by middle- and upper-income groups. The Old Town area is less well located than Saddar, and the shopping effort is higher. Most growth is expected in the Saddar area.

650. There is at present one sub-metropolitan complex in Karachi in the Liaquatabad area. The Liaquatabad Market serves approximately 850,000 low- and middle-income groups in Liaquatabad, FIB Colony, Golimar, the Federal "B" area, Nazimabad, Aurangzi, Qasba, North Nazimabad, and North Karachi. It is situated on a major thoroughfare. It lacks good internal transport, and this may hamper its future expansion.

651. A new KMC market structure is under construction in the Liaquatabad Market. As the population of the Federal "B" and North Nazimabad areas grows the Liaquatabad Market will expand northward, toward the circular road.

652. There are in Korangi two commercial complexes, Babar Market and Mustafa Bazaar, that are approaching the size and market area required for a sub-metropolitan market. At present, however, the population of Korangi is not large enough to support a sub-metropolitan market, nor has the development of Korangi proceeded in such a manner as to encourage the formation of a commercial complex in a suitable location.

653. There are a number of township centres such as Aurangzi Market, Baldia Market, Chowrangi Market, Drigh Colony No. 1, and Liaquat Market in Malir. These typically require 8-10 acres and serve a population of 40,000-140,000, and offer a fairly wide range of goods and services.

654. At the lowest level in the hierarchy of commercial centres are the local centres such as Drigh Colony No. 5 requiring typically less than one acre and serving 2,000-10,000 population.
Analysis of the geographical distribution of population and employment indicates that industrial development has not been co-ordinated with residential development. The result is a large concentration of jobs in some areas with small populations and a large concentration of population in areas with few jobs. This leads to long journeys to work and high transportation costs.

In Korangi, investment was made in the development of the Korangi Industrial Area, but it has been underutilized while industrial land development has been carried out by private sector in other locations. In both North Karachi and Korangi, facilities and structures have been provided for commercial centres and are unutilized, while commercial activities in these areas and many others have located on unauthorized land, without water and sewerage, and in such a manner that future expansion will be difficult. Economic activities have not been encouraged to locate in townships. There is often no space provided for small-scale manufacturing in conjunction with commercial development, yet the two are inseparably linked. There is often no linkage between the installation of transportation facilities and commercial centres.

The lack of developed land in suitable locations makes it difficult to establish and operate small firms, and this in turn reduces the rate of innovation and the opportunity of low-income groups.

A. OBJECTIVES

The objectives for industrial and commercial development, reflecting the broad development objectives identified in Chapter IV and the locational advantages of Karachi identified in Chapter V, have the following major concerns:

(a) To improve conditions for households with monthly incomes of PKR 500 and less.

(b) To contribute to improving the distribution of consumption, within the constraints imposed by the need to achieve minimal adequate consumption levels for basic goods and services. To achieve this, it will be necessary to increase output of basic goods and services, improve access to job opportunities (including opportunities for marginal labour), raise income levels, improve access to capital, and increase efficiency to keep the real costs of goods and services as low as possible. Concern with greater equity at a national scale suggests a need to exploit Karachi’s capacity to support capital and income transfers to other parts of Pakistan.

(c) To contribute as fully as possible to increases in aggregate consumption within the constraints imposed by the overriding concern with greater equity. This suggests that it is desirable to exploit as fully as possible Karachi’s locational advantages for large- and small-scale manufacturing, wholesaling, transport, export-import functions, finance, business services, specialized retail trade and specialized consumer services.

(d) To contribute as fully as possible to the public and private capital formation necessary to sustain economic
growth. The strategy for the metropolitan economy must be concerned with resource conservation and efficiency in both production and distribution including the operation and maintenance of the Metropolitan Area’s physical capital.

(f) To contribute as fully as possible to a reduction of foreign trade deficits and external debt. Karachi's potential for supporting export activities, including intermediate processing and re-export for countries with high labour costs, should therefore be exploited as fully as possible.

(f) To keep the economic risks of development as low as possible and to distribute risk as equitably as possible. Because of this concern it is desirable to maintain or increase the diversity of the metropolitan economy and avoid substantial dependence on economic activities that are very sensitive to external economic fluctuations; it is also desirable to support, rather than restrain, marginal occupations that can provide a cushion against fluctuations in more productive employment.

(g) To encourage the widest possible access to credit mechanisms and capital among all sizes of enterprise. Particular priority should be given to those activities utilizing labour-intensive technologies and which have good economic growth prospects.

(h) To choose future industrial locations in such a manner as to balance as fully as possible the creation of jobs with existing concentrations of population. Future residential development should be co-ordinated with likely industrial and commercial growth centres.

(i) To encourage the efficient location of small-scale manufacturing, the smaller, non-polluting types of large-scale manufacturing and all types of services and trade within and adjacent to residential areas.

(j) To strengthen the hierarchy of commercial centres through the development of sub-metropolitan centres and widely distributed local centres in order to reduce growth pressure on the metropolitan centre.

(k) To accord highest priority to industrial and commercial centres in the installation of infrastructure in order to stimulate economic growth and employment. Areas of extreme deficiency should be improved on a priority basis.

C. THE POLICIES AND PROGRAMMES PROPOSED

1. Financial assistance

659. The State Bank launched on 1 December 1972 a Small Loan Scheme for small manufacturers, construction companies, transporters and businessmen. Small loans would include:

(a) All loans, irrespective of the amount, provided to industrial units with fixed assets (excluding land and buildings) up to Rs.10 lakhs and construction companies for low-cost housing;
loans up to PRs.15,000 for construction of houses;
loans up to PRs.5,000 for agricultural production.
The State Bank has undertaken to underwrite up to 30%
percent of the value of bona fide losses incurred by commer-
cial banks.

441. Commercial banks have been advised to establish Small
Enterprise Departments and Cells. The State Bank has fixed absolute
targets for each Pakistan Scheduled Bank, and failure to achieve
these targets could result in penalties. The target for 1972/
73 is PRs.43.60 crores, including PRs.15.60 crores for small
manufacturing units, PRs.9 crores for small businessmen, and
PRs.1.50 crores for transportation and communication (including
purchase of taxis and rickshaws).

441. This is a liberalization of the earlier small loan
programme, which limited loans to industrialists to a fixed
amount ceiling of PRs.5 lakh and loans to businessmen, firms
and individuals to PRs.25,000, and which did not include
underwriting of commercial banks' losses.

442. The programme in Karachi should be expanded as rapidly
as possible, in accordance with the objectives for develop-
ment of the economy described in the Development Plan.

443. Financial assistance should be provided to the most
innovative and financially sound small manufacturers, busi-
essmen, transportation firms and construction companies.
Small loan cells should be established in branch offices in
order to make the service more accessible and to put the bank
in closer contact with the community and its clients.

444. The administrative effort associated with such loans
would be greater than that for large loans due to the large
number of loans and the small amounts involved. The risk on
each loan would also be higher. Slightly higher interest
rates could be charged to cover increased costs and risk.
Safeguards should be built into lending procedures to protect
against abuse.

2. Technical assistance

445. Technical assistance should be provided to any firm
with potential for growth and development. It should be pro-
vided by representatives of the Sind Small Industries and
Handicrafts Development Corporation working from offices in
each community. The following types of technical assistance
should be provided:

(a) site selection and construction;
(b) selection of machinery and equipment;
(c) marketing;
(d) procurement of raw materials;
(e) production techniques, product improvement and quality
control;
(f) personnel management and training;
(g) accounting and financial management;
(h) market analysis and project financial appraisal.

666. It is particularly important that technical aid be given to firms seeking loans from the commercial banks under the Small Loans Scheme since this would improve tremendously the quality of loan applications, reduce substantially the burden upon the banks and increase the number of loans to small firms.

667. The assistance given "on-site" should be primarily advisory in scope. Technical advisors should refer persons desiring more extensive technical training to the technical training programmes described below.

3. Technical training

668. Technical training should be provided to the key employees of any firms with potential for growth and development and requiring more extensive assistance than can be provided on-site. The courses could be given by the University, the Institute of Business Administration, the Machine Tool Factory, and other groups working under the overall direction of the Sind Small Industries and Handicrafts Development Corporation.

669. The courses should cover the same subject areas as technical assistance although the emphasis would change with the characteristics of the firms involved.

670. The possibility of engaging the members of the Chambers of Commerce and Industry in technical assistance and training for small-scale manufacturers should be explored fully. This would have two purposes: first, to utilize the pool of knowledge and experience available in the Chambers; and, second, to promote resource transfers between large-scale and small-scale activities.

4. Policies for industrial location and the hierarchy of commercial centres

671. The structure proposed for the location of economic activities within the Metropolitan Area is designed to satisfy the locational requirements of firms as fully as possible, given the competing requirements of other land users. The locational structure proposed is anchored by the location of a few key activities and facilities such as the port, the airport, the railway and the Steel Mill and the oil refineries and by the location of the existing activities not subject to change over the planning period.

(a) Industrial location and development policies

672. Several industrial areas are considered to be particularly important due to their location and the types of activities that might be located in them. These include: North Karachi, which is an area of labour surplus and an area in which major utilities can be installed easily with good transport access to the east; Korangi, which contains the two oil refineries which is considered to be a good location for the expansion of petrochemicals; Pipri, which is the site of the proposed Steel
Hill and will have deep water facilities, rail transport and a reliable supply of water and electricity; and Dhaubeji/Gharo, with rail service and reliable water and electrical supply, is recommended that adequate space be reserved in the latter three areas for the expansion of key heavy industries and that light industry not be allowed to pre-empt space that should be used later for heavy industry.

673. North Karachi and Korangi were developed in the early 1960s as Displaced Persons Townships. They were designed to be linked to industrial development, but residential development was allowed to take place far in advance of industrial growth. It is recommended that new industrial zones in other locations not be developed until the industrial zones in these two areas are further utilized.

674. To aid in the utilization of the Korangi and North Karachi industrial areas and also to discourage further concentrations of jobs in the central areas, it is recommended that no further major expansion of the developed area of S.I.T.E. be permitted.

675. The industries that would be located in the Korangi and Pipari areas include textiles, rubber and chemicals, petrochemicals, non-metallic minerals, the Steel Mill, other basic metals and machinery and metal products. In Dhaubeji/Gharo there could be textiles and rubber and chemicals.

(b) Wholesaling location and development policies

676. Wholesaling centres should be located so as to minimize the costs of marketing and purchasing goods within the Metropolitan Area.

677. Food wholesaling facilities should be constructed by the Government. For most other kinds of wholesaling Government should be responsible for land development, but facilities should be constructed by the private sector.

678. Several new fruit and vegetable markets should be constructed. One should be located in Korangi, but centres should also be located in the Pipari, Dhaubeji/Gharo and North Karachi areas. Grains and flour wholesaling markets should be located in the Korangi, North Karachi, Pipari and Dhaubeji/Gharo areas. Automotive parts wholesaling should be located in the North Karachi/Federal "E"/North Nazimabad area. Firewood, timber and coal should be relocated to free the land they now occupy for higher use. They should be relocated along the railway. Finally, additions to warehousing space should be located near the central area, perhaps in the Western Backwater near Nazir Mansion.

(c) Metropolitan and sub-metropolitan commercial location and development policies

679. Commercial development will be located so as to minimize the costs of shipping and to make goods and services as available as possible to all groups. For the income group, densities and transportation systems proposed in Karachi, commercial development should take place within the framework of the four-level hierarchy consisting of metropolitan, sub-metropolitan, township and local centres which has already emerged.
There will remain through 1985 one major metropolitan civil centre, the existing Old Town-Saddar area. It is located and it will expand rapidly for most of the plan-period. There is adequate space for expansion of the site, but services (particularly water supply, sewerage and waste-disposal) are very poor there. They must be upgraded to accommodate the concentrations of jobs and population expected. The street network is basically adequate, but improvements should be made in it. Public transport facilities should be upgraded. Eventually, on-street parking be restricted and off-street public parking facilities

As residential development continues in the Gulshan- and Scheme 31 areas, the centre of market potential will shift from its present location in the vicinity of the University Road and Shaheed Rashid Minhas Road. The location is suggested because it will be well centralized in relation to the future development that is proposed, including development up to the year 2000. The transport system proposed would make it highly accessible from all parts of the densely built-up urban area. It would also be far from the existing downtown functions in the Chundrigar areas to distribute the load of these functions in such a way as to avoid excessive congestion in the existing downtown area. At the same time it is close enough to the existing downtown complex to permit 30-minute door-to-door service for business conferences and other purposes, provided that modern transport facilities are available.

Although the site proposed for the new centre has many advantages it would be difficult to launch a new complex immediately because the existing centre is far from fully developed and the centre of metropolitan market potential is not expected to favor the new centre until 1980-85. However, the new centre can be expanded gradually, first as a township centre, later as a sub-metropolitan centre, and ultimately as a metropolitan centre. Land in the area should be held in public ownership. Sites should be reserved for key metropolitan activities. The area should be promoted heavily, and key activities encouraged to locate there as early as possible.

It is believed to be important to begin to establish such a centre to avoid the kinds of congestion and breakdown that have occurred in many cities of the United States, Europe and elsewhere. Sao Paulo in Brazil and Minal in the Philippines are examples of the rapidly growing cities in developing countries in which high congestion levels in old downtown areas are leading to decentralization of the kind suggested here.

There are likely to be two major sub-metropolitan centres, one in the Liaqatabad/Federal "B"/North Nazimabad area, and one in the Korangi area. As Karachi grows beyond the year 1995, additional sub-metropolitan centres will develop. They will be township centres initially, and gradually expand to become sub-metropolitan centres. Sub-metropolitan centres may develop in Pipri, Dhaobi/Gharo or Saldia, depending upon the level of population and income growth in each area.
685. Local residential areas should be developed within the framework of the four-level hierarchy of commercial centres. Each settlement could contain a principal centre and several local centres. The sizes of the settlements and the commercial centres within them would vary according to the specific circumstances of each.

686. The employment that can be generated in residential areas under conditions likely to exist in Karachi through 1985 has been estimated using a model for the intra-urban location of economic activities2/ that relates household expenditure and shopping patterns to the mix of economic activities and is shown in Tables X.5 and X.6.

Table X.5

<table>
<thead>
<tr>
<th>Economic activity type</th>
<th>Community income type</th>
<th>Employment</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>T.1</td>
<td>T.2</td>
<td>T.3</td>
</tr>
<tr>
<td>Agriculture, forestry,</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>fishing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large-scale manufacturing</td>
<td>230</td>
<td>230</td>
<td>230</td>
</tr>
<tr>
<td>Small-scale manufacturing</td>
<td>370</td>
<td>380</td>
<td>250</td>
</tr>
<tr>
<td>Construction</td>
<td>1860</td>
<td>1860</td>
<td>1865</td>
</tr>
<tr>
<td>Public utilities</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Wholesale trade</td>
<td>20</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Retail trade</td>
<td>2300</td>
<td>2600</td>
<td>3550</td>
</tr>
<tr>
<td>Finance, insurance,</td>
<td>90</td>
<td>110</td>
<td>165</td>
</tr>
<tr>
<td>real estate</td>
<td>500</td>
<td>555</td>
<td>650</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Services</td>
<td>3665</td>
<td>4270</td>
<td>6600</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>10315</td>
<td>13085</td>
<td>15805</td>
</tr>
</tbody>
</table>

a/ Includes employment in township centres, local centres and scattered centres.

b/ T.1, a settlement containing income groups PRs. 0-299 and PRs. 300-499; T.2, a settlement containing income groups PRs. 200-499 and 500-999; T.3, a settlement containing income groups PRs. 0-299, 300-499, 500-999 and 1,000-1,999; and T.4, a settlement containing income groups PRs. 0-299, 300-499, 500-999, 1,000-1,999 and 2,000 and more.

Table X.8
Population, labour force and employment per 100,000 population in townships in settlements with different income structures

<table>
<thead>
<tr>
<th>Community type</th>
<th>T.1</th>
<th>T.2</th>
<th>T.3</th>
<th>T.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>100,000</td>
<td>100,000</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Labour force</td>
<td>12,500</td>
<td>12,500</td>
<td>12,500</td>
<td>12,500</td>
</tr>
<tr>
<td>Employment</td>
<td>23,050</td>
<td>23,050</td>
<td>23,050</td>
<td>23,050</td>
</tr>
<tr>
<td>Per cent of labour force</td>
<td>37</td>
<td>40</td>
<td>44</td>
<td>59</td>
</tr>
</tbody>
</table>

a/ Includes employment in township centres, local centres and scattered centres.
b/ T.1, a settlement containing income groups PRs.0-299 and PRs.300-499; T.2, a settlement containing income groups PRs.0-299, 300-499 and 500-999; T.3, a settlement containing income groups PRs.0-299, 300-499, 500-999 and 1,000-1,999; T.4, a settlement containing income groups PRs.0-299, 300-499, 500-999, 1,000-1,999 and 2,000 and over.

687. A low-income area, for example, may have a lower percentage of retail trade and service functions and a higher percentage of small-scale manufacturing in its industrial and commercial structure than would a higher-income area.

688. Land and infrastructure should be provided within residential areas for small manufacturing firms that can locate outside of major commercial centres to enable them to take advantage of the surplus of labour that will exist in any residential area. Many small manufacturing firms can be located in residential areas without disrupting circulation patterns, the creation of undesirable heavy goods traffic, the creation of pollution or the need for heavy utilities.

689. A strong effort should be made to develop areas containing a mixture of household income groups. Middle- and upper-income households spend much more than lower-income households, and therefore generate more employment. Middle-income groups are most likely to provide investment capital for small-scale manufacturing. This is necessary if employment levels in residential areas are to be high.

690. Sufficient land should be developed in each centre to provide a "core area" that could be expanded to accommodate future growth, but it would be most efficient in most cases to develop considerably less area than will ultimately be needed in each centre. Commercial development can spill over into adjoining residential areas with few negative effects.

691. The location of most commercial development should be relatively predictable, and it is expected that land development for commercial centres will be in the future be in economically viable locations. If, however, commercial activities locate in unexpected but economically viable places, they should be provided with infrastructure and facilities and plots should be authorized to ensure shopowners of a viable location free from uncertainty and possible harassment.
1. Examination of the desirability of establishment of a free trade zone

692. It is suggested that the possibility of establishment of a free trade zone in Karachi — perhaps in conjunction with the new Sundar Qasim Port — be discussed at the highest policy levels. If the concept is approved at the policy level, work should be initiated to analyze the economics of location in Karachi for the various types of firms and to determine the actions that should be undertaken by the Government to get such a project underway.

2. Support for small firms

693. It is essential that financial and technical support programmes for small firms be initiated, tested and expanded. The Sind Small Industries and Handicrafts Development Corporation should be responsible for the provision of support programmes for small firms in the first Metroville and give them its highest priority. As the programmes are developed, they can be expanded to the existing areas and additional Metroville sites.

694. In addition to the work in the Metroville, technical training courses should be established under the overall direction of the Sind Small Industries and Handicrafts Development Corporation. The courses could be given by the University, the Institute of Business Administration, the Machine Tool Factory and other groups.

3. Development of a future second metropolitan centre

695. The possibility of the development of a future second metropolitan centre at the intersection of Rashid Minhas Road and University Road should be evaluated immediately. If a decision is made to proceed with its promotion, action can be taken quickly enough to prevent excessive congestion in the existing downtown area. If such action is not taken, the existing centre is likely to be intensified, and as congestion increases it will spread gradually along M.S. Jinnah Road in the direction of the new centre. Such natural extension is likely to be far too slow to avoid the kinds of breakdown that have been experienced in metropolitan centres elsewhere.

4. Development of commercial centres in North Karachi and Korangi

696. In both North Karachi and Korangi the planned commercial centres equipped with costly pucca structures built with public funds are grossly underutilized because they are poorly located, relatively high in cost and poorly promoted. Entrepreneurs prefer to crowd together on unauthorized land along the major streets and at bus terminals, where there is greater market potential. Korangi in particular should be considered a high-priority area due to its position in the Corridor Plan. It is recommended that the commercial structures and transport systems of both areas be reviewed to co-ordinate them.
better, and that detailed redevelopment plans incorporating specific proposals for land authorization, commercial development and transportation be prepared for both areas. Steps should be taken to link the systems more fully and unauthorized commercial development in viable locations in both areas should be regularized.

5. Land regularization

Immediate steps should be taken to regularize all unauthorized small industries, cabin markets and commercial areas which are not in areas essential for other use according to the Development Plan. Vendors and hawkers should be given the freedom to conduct their business in locations of their choice unless it clearly creates a public nuisance.
A. ISSUES

In the Karachi Urban Area in 1969, with an estimated population of 3.2 million, there were 510,000 households occupying 490,000 dwelling units, an average of 1.04 households per dwelling unit. The average number of persons per household was 5.75.

During the decade 1960-1969, there was a net increase of approximately 168,000 dwelling units (an average of 16,800 per year) while the total population was increasing by 3.2 per cent, which meant only one new DU for each 7.1 persons.

Strikingly is the fact that there was no marked change in the percentage distribution of housing types. Only 43.7 per cent of the housing stock was pucca, 36.8 per cent was semi-pucca, and 17.5 per cent was kutcha in 1969.

CSO data show that among the privately-owned DU's in 1969, 54.4 per cent had only one habitable room and an additional 30.6 per cent had only two habitable rooms. The per cent per habitable room (P/HR) average for Karachi is 1.9, and the lowest-income people (below PAs.100 per month) live at a high rate of 4.7 P/HR.

The availability of essential public utilities is equally grim. Only 30 per cent of all DU's had a piped water supply. Even worse, only 20 per cent had central sewage. Only 10 per cent had water supply, sewerage and electricity.

On top of these already enormous deficits in housing infrastructure, it is estimated that 489,000 new households will require shelter and services in the Karachi Metropolitan Region by 1985. For the most part these new households will also be poor.

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1. Ability and willingness to pay for housing

703. The Government has never been able to obtain satisfactory recoveries from its public housing stock. In Karachi and North Karachi only Rs.7 crores have been realized and Rs.11.62 crores are in default in spite of the fact that both of these projects were heavily subsidized.

704. The real ability to pay for housing and related services is difficult to estimate. The percentage of income spent on housing varies by household according to family priorities, income and the supply situation in the housing market. Unfortunately, there are no household consumption data for Karachi alone, but the CSO has prepared national data which can be used. The main conclusions from the CSO survey data are: 1) families having receipts less than Rs.500 per month are actually in a deficit situation, which means expenditures exceed incomes, and they are forced to periodic borrowing; 2) families below Rs.500 per month are not consuming a sufficient diet of calories and nutritional value by minimum international standards; 3) low-income families pay a greater percentage of their income for lighting and fuel (charcoal, firewood, dung cakes and kerosene) than upper-income households do for gas and electricity; and 4) income groups below Rs.500 per month spend approximately 15 per cent of their incomes on housing, lighting and fuel, but should spend less.

705. Average existing expenditures for housing, fuel and lighting, water and sewerage and maintenance are presented in Table XI.1.

<table>
<thead>
<tr>
<th>Table XI.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditures for housing, maintenance, fuel and lighting and water and sewerage by income group</td>
</tr>
</tbody>
</table>

| Household income per month (Rs.) | Expenditures per month (Rs.) |
| --- | --- | --- | --- | --- |
| | Total | Housing and repairs | Fuel and lighting | Water and sewerage |
| 0 - 299 | 31.0 | 11.3 | 4.3 | 12.1 | 5.3 |
| 300 - 499 | 52.9 | 18.3 | 7.4 | 18.3 | 8.7 |
| 500 - 999 | 93.5 | 51.3 | 8.4 | 21.5 | 12.2 |
| 1000 - 1,999 | 240.2 | 175.8 | 12.0 | 26.4 | 26.0 |
| 2,000 and more | 506.3 | 367.6 | 25.3 | 65.8 | 47.8 |

Source: The table is based upon Government of Pakistan Economic Co-ordination and External Assistance Division, Central Statistical Office, The Quarterly Survey of Current Economic Conditions in Pakistan (Household Income and Expenditure, July 1966 to June 1967). Control totals were taken directly from The Quarterly Survey. Expenditures for each item were adjusted to conform to conditions in Karachi and the Development Plan proposals and to correct for apparent irregularities in the data. These form the basis for estimates of capital available presented later in this chapter.

2/ Letter from S.M. Husain (KDA) to the Secretary, Housing Town Planning and Local Government Department, Government of Sind., 24 January 1973.
2. Land policy and tenure

106. The housing problem in part originates with the failure of previous land policies in Karachi. Karachi is one of the very few urban areas which retains public ownership of extensive amounts of land. But this extraordinary asset is not used to guide urban growth or urban development patterns. The KDA, as the major land development agency, contributes to land speculation by allocating large numbers of plots in new areas before previously developed land is utilized. There existed as of December, 1989, some 12,300 acres of developed vacant land in all schemes. If replanned and utilized at an average net residential density of 200 persons per acre, this existing developed land could accommodate 1,250,000 people. If it is eventually built up at a standard of one household per plot, only 250,000 people will be accommodated.

107. The land policy of the Provincial Government acting through the KDA to dispose of large plots and acreage to individuals and housing societies, which do not have the capital to develop them, is extremely wasteful of public resources. The infrastructure provided is underutilized. Overall development, when it occurs, is at low densities, while at the same time there is a tremendous unmet demand for land within the City by all income groups.

108. The prevailing pattern of land tenure in Karachi favouring the traditional landowner with 99-year leases has not responded to the changing social and economic conditions of Pakistan. It prevents social mobility, impedes redistribution of national wealth and is an obstacle to the satisfaction of social needs. Access to some form of land tenure for low-income people must be seen as both a social and an economic right.

III. HOUSING OBJECTIVES

1. National housing objectives

109. The national housing objectives have been set forth, at least in draft form, by the sub-committee to the Housing Committee of the Ministry of Production and Presidential Affairs in a booklet entitled "National Housing Policy" dated April, 1973. The main objectives set forth in the policy statement are as follows:

(a) "The Government can best take upon itself the responsibility of meeting the cost of providing site and services whereas the cost of construction of houses will have to be financed by the private sector." (p.4)

(b) The three issues given top priority are:

(i) Establishment of effective institutional framework;
(ii) Establishment of a housing finance system;
(iii) Action programme for the housing needs of the low-income families with emphasis on self-help and environmental improvement." (p.7)
The special objectives for the housing policy for low-income families include the following:

(i) "All efforts and resources available with the Government should be devoted to the development of plots for low-income families." (p.13)

(ii) "Public servants not provided with Government accommodation should be given a suitable house-rent allowance." (p.14)

(iii) "Construction of luxury housing should be banned and the size of residential plots be restricted so as to increase the number of plots for low- and middle-income families." (p.15)

(iv) "As a first step toward solving the housing problem of low-income families, open plot development approach should be adopted and home ownership should be encouraged." (p.16)

(v) "A well thought-out industrial workers' housing programme should be undertaken immediately." (p.17) Note: The MFH housing programme disagrees with this objective, as will be seen in the further text. It should be pointed out also that in the discussion of this objective the National Housing Policy paper does not indicate how such a programme can be made to work with reasonable financing.

(vi) "Residential integration of various income groups should be encouraged and housing schemes of low-income people must be located in close proximity to their places of work." (p.18)

(vii) "Slum improvement programme should be initiated immediately." (p.20)

(viii) "A programme of village planning and rural housing should be undertaken."

(ix) "Water supply and sanitation programmes should be assigned priority for the allocation of resources."

710. This very practical list of housing objectives now should be turned into national housing programme targets. The National Housing Policy as presented alludes to but is vague on three issues which are of central importance and deserve to be made explicit: 1) that direct subsidy cannot be used as the basis of a housing programme (such as industrial workers' housing) because of limited Government resources; 2) that the actual building material used in the construction of the house unit is of secondary importance to the total living environment; and 3) that land speculation should be reduced in order to increase the effective supply of developed land in good locations.

2. Karachi housing objectives

711. The Karachi housing objectives are very much within the spirit of the National Housing Policy. The major objectives are the following:
[a] To provide an adequate plot or rental accommodation for every household at a price it can afford.

[b] To increase the incidence of piped water supply, sanitation and electricity to all households from approximately 14 per cent to 68 per cent by 1985.

[c] To prevent unauthorized and unplanned squatting in the Karachi Urban Area through regularization of appropriate existing settlements and the expansion of the open plot development programme.

[d] To undertake the housing programme as fully as possible through private-sector initiative supported by public housing finance mechanisms and land development activities. The Government should avoid managing a public housing stock.

[e] To make the maximum net contribution to the housing stock. Urban renewal, which is largely clearance and replacement of housing, should be kept to a minimum or stopped altogether. No forced relocation of people should be undertaken which will make them worse off economically than they were before.

712. It should be noted by its absence that no reference in the objectives has been made to the type of housing construction. The stress is on the creation of the largest possible housing stock by whatever means and resources available.

C. HOUSING STRATEGY AND PROGRAMMES 1974-1985

1. Strategy

713. In housing the basic strategy is to provide low-income groups better access to the pool of capital and management resources allocated for housing. The purpose is to achieve rapid improvement in their standard of living and thereby hasten the closing of the gap between the rich and the poor. It does not propose any massie subsidy to low-income groups. Because a meaningful level of subsidy is not possible from the available resources, low-income households will be expected to pay their share of the programme costs with some support in the form of internal transfers of capital created by differential pricing policies between upper- and lower-income groups, indirect assistance in the form of better access to credit and preferential treatment on locational choices to reduce transportation costs and improve job opportunities.

714. Since capital and management resources are scarce and time is short, the housing strategy, if implemented, will mean that upper-income people will consume less housing than they would without the Plan orientation. This will be accomplished by increasing the interest rates charged for loans to them, by limiting the number of bungalow plots available and by increasing net densities through encouragement of floor development. It will nonetheless be possible under these conditions to provide more serviced housing land to the middle- and upper-income groups than will be possible if there is no change in the current level of activity.

715. In this report, the term “housing” does not refer only to the physical structure of the shelter. Housing, as
used here, refers to the entire residential environment of the household. It includes not only the shelter unit in terms of floor area, habitable rooms and construction type, but also its plot area, water supply, electricity, gas, sanitation, road access, its access to related public facilities and its access to places of work. It also includes concern with the administrative and financial aspects of the housing delivery system. Attention must be focused on ways and means of improving the total residential environment for people rather than a mere statistical increase in the number of high-standard dwelling units.

2. Target groups for the housing programme

The recommendation is that housing programmes be focused on target groups related to income levels. The income groups for which specific housing policies and programmes will be oriented are as follows:

- **Lowest-income group**: PRs. 0 - 299 per month
- **Low-income group**: PRs. 300 - 499 per month
- **Middle-income group**: PRs. 500 - 999 per month
- **Upper-income group**: PRs. 1,000 - 1,999 per month
- **Highest-income group**: PRs. 2,000 per month and above

The decision to relate housing programmes to target groups defined by their income means, by implication, that all other specialized housing programmes in the public sector should be discontinued. This would include stopping programmes oriented to specialized target groups such as Government workers (including police, teachers, nurses, doctors, civil servants, administrators, clerks, engineers, etc.), as well as industrial workers and semi-autonomous public corporations such as the railway, port trust, airlines, etc. Such a decision does not mean that the public sector should not support the need for their employees to obtain housing. It means that cash housing allowance should be paid instead of the agency actually providing the house units.

There are many reasons why these specialized housing programmes should be stopped. The Planning Commission, in their publication dating back to 1965, has been pointing out the unfairness and heavy cost of these programmes. The current programmes are unfair in that the people selected for available housing are greatly subsidized and the majority who do not have the housing supplied are therefore penalized. The social implications are not consistent with the Government's objective of an open and democratic society as people live in specialized areas, isolated by grade and income. Finally, such programmes fragment managerial and financial resources and create continuing administrative difficulties for the sponsoring agencies. For instance, one year after completion the first 1,700 units of industrial workers' housing in Karachi remain unoccupied because of administrative failure to plan their use.

3. Pricing Policies

The failure to apply adequate pricing to the sale of plots by KDA is the single factor most responsible for the present poor state of infrastructure in the City. It results in large-scale land speculation and a consequent decrease in the effective supply of land available for housing. It results in a transfer of resources from the public sector to the high-
income groups in the private sector. It prevents KDA from obtaining sufficient revenues from land development to establish a continuous and expanding programme for the low-income groups. There is no reason to allow the vast profits from land speculation on KDA plots to continue to accrue to the private sector at the expense of the low-income households.

720. Land prices should be sufficient to reflect the value of the land in each location and thus reduce speculation. They should result in a surplus of funds for KDA to continue the programme in another location. Yet they should be low enough not to create a hardship on the low-income groups or to prevent middle- and upper-income groups from purchasing plots and locating there. The prices proposed for the Metroville range from Kes. 12.0 per square yard for an 80 square yard OPD plot to Kes. 36.0 per square yard for a 240 or 400 square yard bungalow plot, depending upon the size of the plot and its location within the Metroville. Similar pricing policies should be adopted in all KDA schemes, with the specific prices depending upon the location and the types of plots offered.

721. Even allowing for an underestimation of the costs and less than full recovery from the sales on a timely basis, there should be enough funds generated as surplus from new development to undertake the Improvement and Regularization Programme (IRP) of unauthorized areas.

6. The four housing programmes recommended

722. Four basic residential development programmes are recommended for implementation in Karachi, within each of which there may be variation to respond to specific development situations. The public responsibility for the implementation of these programmes is limited to the provision of land and infrastructure and the provision of sufficient credit on reasonable terms. All actual house construction is the responsibility of the private sector and the individual household.

723. The programmes recommended are: Improvement and Regularization of Unauthorized Areas (IRP); Open Plot Development (OPD); Utility Wall Development (UWD); and High Standard Development (HSD). The fewer the number of residential development programmes, the more efficient the management and planning can be. The housing programmes and strategy are to be demonstrated in the Metroville Programme.

(a) Improvement and regularization programme for unauthorized areas (IRP) 3/

724. The Government has tried for many years to resettle population from jhuggi areas. Over 10,000 jhuggi huts have been removed, but still their number is increasing. The CSO estimates that there were approximately 600,000 persons living in unauthorized jhuggies in 1972. The population projections for the Karachi Urban Area suggest that 400,000 low-income

3/ National Housing Policy Sub-committee, Housing Committee of the Ministry of Production and Presidential Affairs, recommended this type of programme. April, 1977 [p. 30].
people will be added to the City by 1985. Given the large population affected and the generally recognized failure of the previous resettlement programme to hold the jhuggi-dwellers at their open plot site (KDA notes that about 50 per cent of the households leave the open plot site after resettlement), it is apparent that wholesale resettlement is not physically, financially or socially viable.

725. Furthermore, studies by MPD of jhuggi settlements have shown that they serve a useful and vital purpose in the urbanization and development process. They are generally located near places of employment and, indeed, are substantial generators of employment through local opportunities for commercial activities, small-scale industries and construction. They usually are associated with a well-developed social structure which offers security to the individual household. Since the quality of the house structure is of little significance in the Karachi climate, the only important concern should be the provision of minimum utilities and facilities to improve the standard of living and reduce the public health risk. This should be the main thrust of the IRP.

726. Over 70 unauthorized areas have already been identified for regularization. This work should be made fully comprehensive and finalized as follows: 1) an appropriate form of land tenure should be given to each settlement area; 2) improvements should be implemented according to established minimum standards. Specific standards should be established for water supply, community water taps and batas, sanitary latrines, storm-water drainage where required, pavements for central paths, and street lighting. 3) An administrative and financial plan should be developed. A schedule of implementation should be established, related to the availability of funds. Specific responsibility for implementation should be assigned to the KDA. This programme should be taken without initial cost to the jhuggi household, but a single quarterly fee sufficient to cover the ground rent, water, electricity, conservancy and sanitary charges should be collected.

(b) Open plot development (OPD) 4/

727. The Government has already sponsored large open plot development schemes in Karachi. However, these schemes have been used primarily for the forced resettlement of jhuggi-dwellers from unauthorized areas rather than as a positive programme of low-cost residential development and projects have been in some cases poorly located. In addition, the related infrastructure and community facilities have not been provided on a timely basis, creating further hardship among the families affected.

728. OPD consists of providing plots and minimum quality standards, but no house unit either partial or complete. The main advantage of the programme is that it provides secure land tenure at low capital cost in planned areas. The plots so provided can then be improved through time by increasing the level of utility services and facilities and

4/ National Housing Policy, op. cit., recommends this type of programme. (p. 16).
through improved housing construction on the part of the individual. This process is accomplished at much lower public cost and with greater flexibility than if an attempt were made to create a pucca neighbourhood initially. This will permit a larger population to be served quickly with the resources available.

729. The mix of plot sizes may range between 80 and 120 square yards. Each plot is to be served by community water taps and baths, sanitary latrines, paved central roads, lighting and essential electricity for small-scale industries and storm-water drainage where required. Economic activity will be encouraged throughout to create the maximum job opportunities on site. This will include provision for the establishment of cabin markets on appropriate sites. Small-scale industries and other such economic activities should be permitted on residential plots and on residential-commercial plots. Community and on-site administrative offices will be established during the initial development of OPD.

(c) Utility wall development (UWD)

730. The UWD programme goes one stage beyond the OPD scheme. It provides utilities inside the plot in a utility core with a small plinth area. The UWD consists of constructing on each plot a plinth of 75 square feet with a concrete floor. A wall of concrete blocks eight feet and six feet high is built on the floor, to which are attached water points for the kitchen and bath, a W.C. and, if available, a gas outlet. The plots are linked to a sanitary system and a piped water supply. No house structure is provided. This remains the responsibility of the household. This programme will provide a higher standard of utility than is initially provided in the OPD and will fix the position of each dwelling unit on the plot, which will ensure better cross-ventilation and encourage better overall design. The type of structure to be built on the plot will be left entirely up to the individual and his ability to pay.

731. Site planning for the UWD areas will be very similar to the OPD schemes. The UWD concept is shown in the diagram.

732. It is anticipated that low-income people down to PRs.100 per month could afford the UWD if they built a semi-pucca structure on the plot initially. Yet, the UWD will be attractive to households earning PRs.500 or who would proceed to build a pucca structure immediately. The major advantage of this programme is the flexibility to respond to the needs of a wide spectrum of the income range at a relatively low cost.

(d) High-Standard Development (HSD)

733. Although the recommended housing strategy places major emphasis on programmes for the lower-income groups, there would be in the Karachi Urban Area a need for dwellings units of High-Standard Development. High-Standard Development refers to pucca dwelling units with full utility services. The threshold income for affording, without subsidy, a High-Standard dwelling unit is estimated to be PRs.500 per month.
High-standard development will take the form of bungalows, townhouses, garden apartments, walk-up flats and high-rise buildings. The actual mix to be achieved will depend largely on market factors, but as a policy the number of bungalows allowed is to be kept to a minimum. This is to be done by limiting the new plots developed for bungalows mainly to between 120 and 600 square yards, with a few reaching a proposed maximum of 1,000 square yards. These should be integrated into all new townships according to the higher-income group's percentage of the total projected population. The purpose of reducing the availability of bungalow plots is to reduce development costs, increase densities and reduce the demand for construction finance for luxury homes.

A gradually increasing part of the upper-income households will be encouraged to live in various types of multi-family units ranging in density from 160 persons per net residential area (P/NRA) to 1,100 P/NRA. The style and finish of the flats, the development of the surrounding open space will provide sufficient variables to allow high-density units to reflect the ability to pay of the upper-income groups.

5. Existing housing programmes and resource constraints

The urban population of the Karachi Metropolitan Region is expected to grow to 5.9 million by 1985. The increase of 2.7 million people beyond the estimated 1974 population of 4.2 million, or an estimated 470,000 households, comes on top of a population already ill-housed. The inescapable fact is that Karachi will continue to experience a serious housing problem throughout this century. For instance, allowing for no renewal or clearance of existing overcrowding, it would cost approximately PRs.809 crores to house the new households at standards of semi-pucca and pucca construction with approximately two persons per habitable room and with most households enjoying the basic utilities of water, sewerage and electricity (with only the cost of the distribution network of utilities included). Between 1985 and 2000 it is estimated that up to another 1 million urban households will require housing in the Karachi Region.

Against these very high demands, the current resources are extremely modest. In the decade between 1960 and 1975, it was estimated that approximately PRs.100 crores were spent on housing of all types. The current levels of lending by HBPCC for all of Pakistan are PRs.5 crores per year and the have hopes of increasing the level to PRs.20 crores per year by 1974. If additional Government funding is provided, has typically received well over 60 per cent of HBPCC loans to West Pakistan and is expected to receive approximately PRs.10 crores in 1974.

The KDA is running on a budget of PRs.8 crores, but that includes the Bulk Water Supply Scheme and other non-residential development activities. An allocation of PRs.2 crores is made for resettlement work which does not add substantially to net new plots required.
available for housing.


6. New building plots and dwelling units required, 1974-1980

741. The programme shown in Table XI.2 is based upon estimates of household's ability to pay for housing, the housing finance programmes proposed in this chapter, estimates of the costs of housing and the current supply of housing and land in Karachi. It is a minimal programme that, if implemented, would still have a dramatic, positive effect on the overall housing situation in Karachi. It is consistent with the utility system proposals presented in Chapters XII and XIII.

742. The number of dwelling units required is based upon the assumption that there will be few losses from the existing housing stock, and that existing housing will be maintained in more or less its existing state or be improved to reduce room occupancy rates or increase the incidence of utilities over the next 11 years. The number of new dwelling units is therefore equal to the forecast increase in the number of households in each income group.

743. The acreage required is based upon the housing programme for all programmes except the HSD programme. It is assumed that much of the HSD housing will be built upon existing vacant developed plots in areas such as Clifton, the Federal "B" area, Gulshan-e-Iqbal and other similar areas. The acreage proposed for HSD housing is sufficient to encourage middle-income and high-income groups to locate in new schemes, but it is intended to focus land development efforts on the lower income groups and to encourage much more efficient utilization of land in the Metropolitan Area.

744. It should be noted that no allowance has been made in the housing programme for wholesale resettlement of jhuggies from unauthorized areas or because of urban renewal. If projects such as Jacob Lines are implemented in the ways proposed currently they will make the overall housing situation worse because it will divert substantial Government financial and management resources into essentially a dwelling unit replacement project which will not generate a sufficient net addition to the housing stock.

745. The programme proposed for the period 1974/1975-1979/1980 reflects the expected levels of income in Karachi and the currently underdeveloped status of housing finance programmes. It assumes few, if any, losses from the existing housing stock. A total of 242,000 units are required for the six-year period. Approximately 102,400 units, or 40 per cent of the total, should be OPD units. An additional 74,500 or 31 per cent of the total should be OWD plots. The remaining 65,100 or 27 per cent of the total should be bungalows, townhouses or flats. Approximately 2,065 acres should be developed for OPD and OWD housing, and 452 acres for HSD housing.
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a/ 6.5 per cent interest/15 per cent downpayment/25 years repayment period.
b/ 12.0 per cent interest/15 per cent downpayment/15-20 years repayment period.
c/ 20.0 per cent interest/30 per cent downpayment/7 years repayment period.
d/ Accr in for land development restricted to allow for utilization of existing developed vacant land.
e/ Access for land development restricted to allow for utilization of existing developed vacant land.
The cost of meeting the minimum requirements of the poor through the OPD is only Rs. 15.7 crores, or Rs. 260 lakhs per year. This provides every new low-income household to 1980 with minimum infrastructure and a kutcha house. The cost of the programme is small but the potential benefits — authorized land, adequate services and a basis for further development — are of great importance for the future of the City. The costs to fully implement the 242,000 dwelling unit programme in the Karachi urban area during the next six years will be Rs. 158.1 crores, equal to the total capital made available by the various financing groups.

7. New building plots and dwelling units required, 1980-1985

Population growth over the period 1980-1985 is expected to result in the need for 247,000 additional dwelling units in the Karachi urban area. If the targets of the Development Plan have been achieved, it is expected that incomes will be higher and the housing finance programme will be fully developed. As a result, there will be a shift in the composition of the programme enabling the provision of increasingly better services and housing.

The number of OPD units should be approximately 56,000 or 23 per cent of the total. The number of UMD plots should be increased to 107,860, or 44 per cent of the total. The remaining 83,120 units or 33 per cent of the total should be bungalows, townhouses or flats. Approximately 1,870 acres should be developed for OPD and UMD housing, and 520 acres for HSD housing.


Adequate financing is crucial to the housing programme proposed. Without adequate financing low-income groups in some cases will be hard pressed to afford plots. They will be in many cases unable to afford the minimal services needed for basic sanitation and other functions and the minimal structure needed for privacy and protection from the weather.

It is assumed that three financing programmes will be operative in the Karachi area over the next six years. These are the HBPC, which is considered the primary source of long-term loans for the low- and middle-income groups, and which is assumed to lend money to low- and middle-income households for 15 years at 6.5 per cent; the conventional banks, which are assumed to lend money to high-income households for 15-20 years at 12.0 per cent; and other sources of finance, such as money lenders and informal societies, which are assumed to lend money to low-income households for seven years at 20.0 per cent. The total capital that can be made available under these three programmes given the expected expenditures of households for housing is Rs. 158.1 crores by 1979/1980 and Rs. 204.5 crores for the period 1980/1981-1984/1985.

5/ The cost estimates presented here are preliminary and were prepared before the recent upsurge in construction costs. They should be revised accordingly in later and more detailed programming and budgeting.

4/ Same notation as 5/.
751. The appropriate interest rate is an important component of the national housing policy. The rate currently charged by HBFC for loans of less than PRs.20,000 is 6.5 per cent, which is used here for forecasting purposes. It is noted, however, that such a low rate should be used only for housing for the lowest-income groups. Unless a higher interest rate is used or "soft" loans are obtained from international agencies, the programme will eventually be curtailed for lack of funds. The interest rate for housing should be examined thoroughly as the programme is expanded.

752. HBFC financing is the key item in the housing programme proposed. In order for the HBFC programme to be effective, plots must be developed for low-income groups in locations they can afford, HBFC must expand its programmes to include open plot development and utility wall development and HBFC must obtain the seed capital necessary to expand its programmes. The HBFC currently loans approximately PRs.4.8 crores per annum in Karachi. This must be increased to PRs.15.4 crores by 1979/1980 if the programme targets are to be achieved. The capital to be made available for housing by HBFC for the period 1974/1975-1979/1980 is PRs.50.8 crores, of which the HBFC share (net of the 15 per cent downpayment) would be PRs.43.1 crores. Approximately 90 per cent of the HBFC programme should be for open plot development and utility wall development.

753. It is expected that the HBFC will assume an increasing share of the overall housing finance programme after 1980, by which time its programmes for the lower-income groups will be fully developed. The capital to be made available by HBFC for the period 1980/1981 - 1984/1985 is PRs.99.9 crores, of which the HBFC share would be PRs.85.4 crores. Approximately 55 per cent of the HBFC programme should be for open plot development and utility wall development over this period.

9. Housing targets beyond 1985

754. The period 1985-2000 will see the need for up to 1 million more urban dwelling units in the Region. Though this is an enormous number of units, some 67,000 per year, Karachi should by then have the institutional base necessary to respond to this challenge. In addition, the general economy will have improved considerably and individual household incomes will have increased.

755. It is also likely that there will be some shortfall in the 1974-1985 targets because of the need to set up new housing institutional and finance machinery. The period 1985-2000 might therefore have some carryover from the previous period. One of the major accomplishments of the 1974-1980 period will be the completion of the IPR. Also, the special machinery needed to work with low-income groups will have been created. Therefore, it will be possible to mount a major attack on the reduction of overcrowding for low-income people. This will be the major goal of the second phase of the housing programme.

756. This suggests that there will be a need for more UWD plots and less OPD. There will be a need for more flats and townhouses available to the middle-class.
10. Rural housing and semi-urban housing

757. The housing programme targets discussed so far are for the concentration of population in the urban areas of the Region. There would also be a rural and semi-urban population of 1 million in the Region in 1985 and 1.6 million in the year 2000.

758. The population densities in semi-urban and rural settlements in the Region could be considerably lower than those projected in Karachi. It is likely that at least initially there would be uneven and thin infrastructure support, particularly sanitation, and therefore larger plot sizes would be acceptable. In some cases the plot size might have to be sufficient to support a tubewell.

759. The 1961 Census indicated a very bleak picture regarding rural housing conditions in Pakistan. There were 6.1 million rural houses of which 80 per cent were of kutch construction, 90 per cent had no latrine or bathroom and less than 5 per cent had a piped water supply. Field investigation has indicated that similar conditions exist in the Karachi Region.

760. In planning for increasing rural living standards, recognition should be taken of several basic planning criteria. Rural kutch housing like urban kutch housing, provides an adequate shelter in the Karachi climate. The rural people should not be encouraged to invest or go into debt in order to obtain a pucca or semi-pucca structure unless it is their free choice. Government should not provide subsidize for such housing. The absence of rural sanitation is also not a serious problem because of the generally low densities. Some advice and assistance on the preparation of sanitary latrines on a self-help basis might be useful, but no major programme is required.

761. The crucial thrust of a rural improvement programme should be in the areas of water supply, health facilities and schools. All of Government's resources available for non-agricultural rural development should be focused on these three priority targets.

II. Impact on the construction industry

762. The HBPC has prepared an analysis of the impact of a housing construction programme on the economy. This useful work has been adopted here with relation to the housing programme target proposed for Karachi.

763. The crudely estimated combined payroll of the proposed middle-income housing construction programme would be Rs.1.40 lakhs per month, covering 32,500 jobs.

764. The construction industry supplying pucca housing is only one part of the industry that is relevant for the total programme. There is another segment of the construction industry working in Karachi which is oriented to the needs of the low-income groups for kutch and semi-pucca construction. Very little is known about this informal construction. It can be seen from field inspection that there are many small commercial establishments selling various types of soil cement bricks, poles, roofing materials, etc. A large number of
small contractors and individual skilled labourers are working in this sector. It can be anticipated that the proposed emphasis on the provision of building plots to low-income groups for the construction of kutchas and semi-pucca housing will provide a substantial stimulus for this informal and/or small-scale sector. A survey of the construction industry (formal and informal) should be undertaken as soon as possible to help to assess the capacity of the industry to respond to the scale of housing need that is foreseeable.

12. The housing delivery system

The housing delivery system is the total set of public and private entities and processes through which finished houses are provided to individual households. It includes all aspects of the development of land and infrastructure, the construction of housing units and the finance and administration of the total process. At present the housing delivery system is working badly. There is a general lack of finance and financial institutional capacity. There is enormous red tape for the individual or contractor participating in the house-building process. Though plots are available, they are not fully supplied with infrastructure on a timely basis. The low-income groups are denied access to housing credit, can not obtain plots in locations of their need and are subjected to resettlement and harassment when they live in unauthorized areas. What is needed is a reorganization of the housing delivery system.

(a) The role of KDA and other land development agencies

KDA will have the full responsibility to lay out plots and develop infrastructure, either with their own staff or with contractors. They will not have responsibility for any house construction, nor in fact will any government housing be built under this recommendation by any agency except the Ministry of Defence.

KDA will not finance its own construction activities or dispose of plots on time payments. Instead, KDA will seek to arrange construction finance for the one- to two-year period of development for each scheme from a lending institution. Upon completion, it will dispose of plots to individuals or contractors (but not housing societies) who have arranged long-term financing with the HBFC. In this process, KDA will be able to plan its cash flow in advance and therefore can undertake forward planning for its building programme. Currently KDA does not know from year to year what its building programme is going to be and therefore time is lost, capital is underutilized and the scale of operations remains inadequate to meet needs.

KDA would dispose of its plots on a differential pricing policy so that overall housing policy objectives are served. In particular, this would mean creating a surplus from the disposal of plots to upper-income groups for the purpose of reducing the cost of plots to lower-income groups. This can be achieved by locating the larger plots on the main distribution roads where the costs of providing infrastructure will be less and they will command higher prices.

The Central Government would guarantee the construction loans, but no longer would make direct grants to KDA for its operations:
(b) Construction finance agencies

771. At present there is no major source of housing construction finance independent of long-term finance. Construction finance is provided by the builders directly from their own resources, is collected in the form of advance payments from the eventual purchasers of housing, provided in very limited amounts by commercial banks, or is arranged as a part of the long-term finance from the HBFC.

772. These sources have serious disadvantages. The contractors run much higher risks that they will become bankrupt on a project if they finance it themselves (in case of any miscalculation) and the scale of their operations become severely constrained as a result. Collecting from individual purchasers in advance greatly reduces the potential market because few people have the necessary money in advance. It also raises the risk to the individual in case of fraud or default on the part of the contractor. The HBFC can provide construction finance, but it greatly increases its administrative costs and makes for higher risks for the return generated on long-term lending.

773. What is recommended is the creation of a separate source of construction finance which will lend to the Government and private builders for the construction period of plots and infrastructure or houses. Since this lending will be for a relatively short period of one or two years, it can be made an interesting area of activity for such agencies as the National Bank of Pakistan, commercial banks, insurance companies and provident funds. The rates of interest charged should be full commercial rates.

774. The HBFC would stand ready to provide the long-term finance which would be used to pay off construction finance loans. This system has the additional advantage of introducing into the process substantial amounts of private capital which would not be available for long-term housing loans.

(c) The House-Building Finance Corporation

775. Under this recommendation the HBFC becomes essentially the National Housing Bank. The HBFC will have the responsibility of providing the long-term finance for housing. The operations of the HBFC have been expanding over the last year and many improvements have been made in management and procedures. Nonetheless, the HBFC will have to undergo enormous change to generate the capacity required to support the housing programme needed in Pakistan. It will need to expand its operations with field offices.

776. None of the above will solve the housing problem unless the resources of the HBFC are greatly expanded. More can be done if Government contributes as equity the monies which have previously gone into various kinds of specialized housing programmes (industrial workers' housing, Government officers' housing, etc.) which have been recommended here for termination. This alone will still not be enough and therefore the HBFC should begin to attract private deposits by taking on a savings bank function. It will be necessary to make the rate of return on these savings sufficiently attractive. This can be done by setting the return above
that on other savings accounts and by making the interest paid tax-free. The savings accounts should be guaranteed by Government. A further inducement to save with the HBFC would be to tie the savings programme into preferential treatment on borrowing with the HBFC for house-building.

777. Private borrowings through the use of bonds with a government guarantee should also be considered.

778. The HBFC should be operated on sound banking principles. It should make no subsidized loans. It may make loans at varying interest rates, as it does now, to encourage limits on borrowing.

779. The HBFC should form a low-income housing subsidiary. The purposes of this would be to make very small loans to low-income groups for the purchase of open plots or utility wall plots and to provide funds for the minimum materials required for a house. An upper limit of Rs.10,000 should be placed on loans from the subsidiary with no lower limit.

780. Loans for low-income people have different requirements than those to middle- or upper-income people. The number of potential borrowers is much higher, the amounts much smaller, and the risks are larger. All of which means that there will be greater administrative costs involved and need for somewhat lower interest rates. It is likely, therefore, that the lending programme for low-income groups will require a subsidy element. The subsidy should be for the additional administration required which can not be passed on to the borrower if the interest rate is to be kept low, and a subsidy to form a reserve for uncollected loans.

781. Since the HBFC must maintain its credit rating with depositors and lenders, it would be a mistake to mix these two kinds of lending operations. The loans to low-income people might make the HBFC unsound financially. On the other hand, it is important that the subsidies from Government are utilized directly for the purpose of providing service to the low-income group and this will be facilitated by keeping the funds independent of the HBFC’s general funds.

782. The special subsidiary programme should also be prepared to make small loans to assist in establishing commercial or service activities or small manufacturing activities within open plot or utility wall projects in conjunction with a loan for housing. This will assist in generating employment in the new settlement areas.

783. It will be necessary for the subsidiary group to decentralize its offices directly into the major Metroville project sites for which it is providing finance. This will be necessary in order to make loans quickly and simply, monitor progress on construction and to seek repayment on a regular basis.

784. At the same time, it might well be possible to utilize the office of the HBFC subsidiary on site to provide a simple community development programme effort. The rationale for this would be to attempt to increase the collection of the loans and safeguard property values by assisting the people in developing their community—in the physical, social and economic sense—as soon as possible.
programme would provide a limited level of technical assistance from the HBFC subsidiary-oriented to supporting local voluntary groups as they organize. Coverage might include such things as the following:

--- Increasing income through employment opportunities, information, adult skill-improvement courses, and vocational training.
--- Improving health through personal hygiene and community health projects.
--- Adult literacy courses.
--- Assistance in self-help building techniques for housing and community projects.
--- Assistance in organizing co-operatives, etc.

(d) The role of the construction companies

785. Private builders and contractors will be given full responsibility for all housing construction. They will be supported with adequate construction finance as described and with the knowledge that long-range finance will be available from the HBFC. The HBFC is already working with builders in a similar manner. The HBFC reports that this is very satisfactory because the builders, in selling their homes, screen the potential applicants for finance. Nonetheless, the present scale of activities will have to expand greatly to meet the housing programme targets. Improved finance will be a major help, but attention must be given to other aspects of construction contracting as well: 1) the pool of qualified builders and contractors must be enlarged and those with experience must be expanded. In part it will be necessary to see that a higher rate of profit is enjoyed by contractors than is typical at present in order to attract the necessary management skills into the business; 2) the skilled labour pool must be expanded. There appears to be a large number of architects and engineers available and unskilled workers, but skilled labour, supervisory staff and management staff are reported to be in short supply. Special training schools along the lines suggested by the HBFC should be established to expand the labour resources in this area; 3) building materials have been subject to rapid inflation and periodic shortages have been appearing. The housing programme will need a smooth flow of building materials and attention must be given to ensuring supply. It should be the responsibility of an HBFC forward planning unit to monitor these aspects of the construction sector and make recommendations to Government as required.

D. IMMEDIATE ACTION

786. Not all of the recommendations for housing can be implemented at once. They involve nothing less than a complete reorganization of the housing delivery system, changes in the mix of housing types and actions on a sustained scale unparalleled in the history of Pakistan. The following recommendations are made for action,
1. Land speculation

797. Land speculation should be curtailed as much as possible through the restriction of future land leases to only those with demonstrated ability to finance the housing or other land use construction. Such a demonstration would be in the form of a letter of intent from the HRFC or other financial agency to loan the funds required, or the presentation of proof of deposit of sufficient funds in a bank. In addition, the initial lease agreement between KDA and the individual or contractor would be for two or three years only, with an option to renew for a long-term lease upon proof of completed construction.

798. No plots should be leased to housing societies because of their history of bad management, incompetence and speculation.

799. A vacant land tax sufficient to recover the speculative land value increase on previously allotted plots should be introduced in order to make available currently unutilized developed land and to end land speculation. A more drastic and, if legally possible, more desirable alternative would be to repossess vacant plots which have not been built on within the time limit specified in their lease agreement. The latter course would allow more flexibility in the replanning of vacant land.

2. Land tenure

800. Secure land tenure for an economically reasonable period of time should be made available to low- and lowest-income people in locations suitable to their needs.

801. Procedures for obtaining leases should be simplified drastically to provide wider access to the urban land market, for low-income households in particular, to simplify the enforcement of leasehold terms and to reduce opportunities for malpractice in the issuance of leases. Consideration should be given to the elimination of stamp duty and other procedures which greatly inhibit efficient and legal land market operations.

3. Demonstration residential development schemes

802. The basic ideas presented in the section on the housing delivery system will require some time for full implementation. There will be a period during which the situation is in transition. Nonetheless, agreement in principle should be established now to the following recommendations so that planning by the agencies involved can commence.

803. It is recommended that three demonstration residential development schemes be undertaken as soon as possible:

[a] It is recommended that KDA in conjunction with other related agencies be authorized to start the implementation of the Metroville Programme discussed in Chapter XXIII.

[b] A specific project for demonstrating the Improvement and Regularization Programme should be prepared and implemented in 1974.
(c) The KDA should be requested to undertake the construction of a small demonstration project in one of their existing schemes to test the UWD concept and demonstrate the flexibility of house construction alternatives by building sample kutcha, semi-pucca and pucca house units utilizing RC. The total cost of the project should not exceed Rs. 5 lakhs. MPs should plan and execute an evaluation and consumer survey of the demonstration project. It should include provision for experimentation with plot layouts; house design; construction procedures and materials; community organization for self-help and co-operative house-building; technical assistance in house design and construction for low-income households; experimentation with lease procedures and financing; and provision for proper public maintenance and service functions including health, education and recreation, as soon as occupancy of the project area begins.
CHAPTER XII

WATER SUPPLY, SEWERAGE, RAINAGE, RIVER MANAGEMENT AND REFUSE

A. TRENDS AND ISSUES

1. Water supply

Responsibility for the development and maintenance of water sources and treatment plants rests with the Karachi Development Authority. KDA maintains the trunk mains and small part of the distribution system. It sells the water to a number of distribution authorities who in turn sell the water to the users.

Water is available to the distribution agencies only on limited number of hours each day. Only the Karachi Trust has a 24-hour supply and the duration of supply remains varies from three to twenty hours daily.

At the present time approximately 164 MGD of water is available to Karachi.

Water consumption has varied over the years with availability as shown in Table XII.1.

Table XII.1

Water consumption and source availability 1947-1973

<table>
<thead>
<tr>
<th>Population in million</th>
<th>Dholota system</th>
<th>Haleji system</th>
<th>G.K.B. W.S. system</th>
<th>Total supply</th>
<th>Charged Consumption</th>
<th>Per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.44</td>
<td>10.0</td>
<td>-</td>
<td>-</td>
<td>10.0</td>
<td>8.4</td>
<td>22.7</td>
</tr>
<tr>
<td>2.50</td>
<td>10.0</td>
<td>10.0</td>
<td>-</td>
<td>20.0</td>
<td>16.8</td>
<td>40.0</td>
</tr>
<tr>
<td>1.22</td>
<td>10.0</td>
<td>20.0</td>
<td>-</td>
<td>30.0</td>
<td>25.2</td>
<td>24.5</td>
</tr>
<tr>
<td>2.23</td>
<td>2.0</td>
<td>20.0</td>
<td>70.0</td>
<td>92.0</td>
<td>84.0</td>
<td>43.8</td>
</tr>
<tr>
<td>3.50</td>
<td>2.0</td>
<td>20.0</td>
<td>140.0</td>
<td>162.0</td>
<td>120.0</td>
<td>46.7</td>
</tr>
<tr>
<td>4.00</td>
<td>2.0</td>
<td>20.0</td>
<td>140.0</td>
<td>162.0</td>
<td>138.0</td>
<td>40.5</td>
</tr>
</tbody>
</table>
799. At the present time the water pressure is low throughout the City; water cannot be supplied direct to the first floor of two-storey buildings in many areas.

799. In some parts of the City the pressure at fire hydrants is not enough for water to be used directly for fire fighting purposes. Pumps installed in the fire-brigade carriers are used to draw water from underground tanks or other available water sources.

800. At present there is a service reservoir storage capacity of only 56 MGD, i.e., less than six hours supply at peak demand. This is a serious deficiency.

801. Up to 30 MGD of the water harnessed at source is unaccounted for in the billing process. This is as much as the total water available in 1962. It is likely that additional quantities of water are wasted due to leaking taps, the bottom and top tank pumping sequence and other causes.

802. KDA supplies water for the whole of the City at two rates: constituent bodies are supplied water at Prs.1.00 per thousand gallons and non-constituent bodies at Prs.1.5 per thousand gallons. There is no tariff differential between domestic, commercial, industrial and construction purposes.

803. Sales to the distribution agencies are based on meter readings, but out of 300 meters employed, over 100 were inoperative in November 1973.

804. The retail charges differ in the various parts of the City. Where meters are used the charge lies within the range of Prs.1.19 to Prs.1.75 per thousand gallons. Where meters are not used the charges are based on the annual rental value of property or plot size. NMC, the biggest distribution agency, charges a water rate of 6 per cent to 6.5 per cent of the annual rental value. Although water rates are tied to annual rental value and rentals for properties built prior to 1941 were frozen at 1941 levels, it has been estimated that this affects about one-third of the densely built-up centre of the City.

805. Wherever private tankers or other water vendors supply water, the rate varies from Prs.12.50 to Prs.30.00 per one thousand gallons.

806. At present only 33 per cent of households have a direct "on the plot" water connexion.

2. Sewerage

807. The present sewerage system is grossly inadequate. Deficiencies exist at all levels and the maintenance of the system and treatment plants is unsatisfactory.

808. Only 20 per cent of the households are connected to the sewerage system. The remainder rely on night-soil collection service, pit latrines or waste ground to dispose of their wastes. A large proportion of the night-soil collected ends up in the surface water drains.
3. Surface water drainage

010. Rainfall in Karachi averages only 7.7 inches per year. The variation from year to year is large. Several years may pass without appreciable quantities of rain falling, yet individual storms can be of considerable intensity. Severe storms occur every five to seven years, usually in July or August as a result of the monsoons. It is difficult to allocate resources for surface water drainage because storms are so infrequent, yet when they do occur they are likely to cause severe flooding, property damage and even deaths.

011. The destructive effect of storms is magnified by blocked and badly maintained culvert entrances. A programme should be instituted whereby all drains are cleared in June.

012. It is not possible to design a system which can cope with the severest storms. A degree of flooding will have to be tolerated. The effects of flooding can be ameliorated by careful design. For example, in the lower reaches of the urban area, efforts should be made to get surface water diverted into the trunk drains as soon as possible. Most of the trunk drains are available, but the reticulation system is missing or deficient.

013. In the middle and foothill zones, an attempt should be made to keep the runoff out of the trunk drains as long as possible by suitable grading and by means of the design of the open and underground mains. In addition, in the foothill zone, small dams outside the built-up area should be utilized to arrest the flow. Wherever possible, the existing nullahs should be utilized in their natural state as main collectors; it may be necessary to stabilize their banks by simple construction techniques, but that is all.

014. Most of the drainage discharged from the urban area ends up in the Lyari and Malir Rivers and, ultimately, the sea. If flooding is to be controlled in Karachi, it will be necessary to restrict the discharge from these rivers' extensive rural catchments. A series of small dams and deviation canals should be constructed in the Region and utilized both for flood control and land irrigation. Some control is also necessary where man-made drains discharge directly into the sea. Tidal gates should be fitted in these instances.

015. The development agencies have not given enough consideration to surface water drainage in the past. It is necessary to plan for surface water run-off when areas are first opened for development.
816. As in water supply and sewerage, responsibility for refuse collection services is distributed between a number of authorities or boards, some of which are inefficient and poorly funded. The result is that large areas of the town are without a refuse collection service.

B. OBJECTIVES

817. The crisis situation described in the preceding section underscores the urgency of action in this sector. The following objectives are recommended for the period 1974-1985:

(a) To provide an adequate supply of safe potable water and a sanitary environment for a majority of the Metropolitan population by 1985, with highest priority for low-income households, at the same time achieving adequate water supply and waste treatment for manufacturing, commercial and other non-domestic purposes. The minimum domestic service target should be 60 per cent of all Metropolitan households with individual water and sewerage connexions by 1985. For budgeting purposes, 80 per cent with individual connexions is used.

(b) Targeted water consumption standards for 1985 range from 10 gallons per capita per day for households with monthly incomes of Rs.0-299 to 100 gallons per capita per day for households with monthly incomes of Rs.2,000 and more. Differential pricing is to be established, with higher unit rates for households with high per capita consumption, to encourage efficient water usage, to support the equity objectives of the Development Plan and to assist in financing minimal adequate services for low-income groups.

(b) To put water supply and environmental sanitation on a self-financing commercial basis as quickly as possible.

(c) To utilize existing investment in water supply and environmental sanitation facilities as efficiently as possible.

(d) To use the Liquid and solid wastes of the Metropolitan Area and the Region as a whole as efficiently as possible, in support of national, provincial and local resource-conserving aims.

(e) To use the installation of water supply and environmental sanitation facilities as an instrument for guiding Metropolitan growth in accordance with the Development Plan, discouraging the types of premature opening of new areas that have been so socially wasteful in the past.
C. THE PROGRAMME FOR 1974-1985

I. Water supply

(a) Future water demand

81.8. The future domestic water demand is primarily a function of the social and economic characteristics of the population. Water consumption, particularly if metered, will be correlated with ability to pay. Estimates of domestic consumption by income group are based upon observations made by the offices of the Karachi Municipal Corporation. They are presented in Table XII.2.

Table XII.2

<table>
<thead>
<tr>
<th>Household income groups (Rs. per month)</th>
<th>Domestic per capita consumption (gallons per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Less than Rs.300 per month</td>
<td></td>
</tr>
<tr>
<td>a) Stand post</td>
<td>10</td>
</tr>
<tr>
<td>b) House connexion</td>
<td>14</td>
</tr>
<tr>
<td>c) House connexion with sewerage</td>
<td>17</td>
</tr>
<tr>
<td>2. Rs.300-499</td>
<td>25</td>
</tr>
<tr>
<td>3. Rs.500-999</td>
<td>30</td>
</tr>
<tr>
<td>4. Rs.1000-1999</td>
<td>60</td>
</tr>
<tr>
<td>5. Over Rs.2000</td>
<td>100</td>
</tr>
</tbody>
</table>

819. It has been assessed that domestic consumption constitutes 60 per cent of demand, and large industry 16 per cent. The water demand for 1980 and 1985 has been assessed as 295 MGD and 390 MGD respectively, including a demand for 22 MGD from the proposed Steel Mill works.

820. The demand projections are optimistic. They are based on the assumption that over 80 per cent of the households will have on-plot connexions by 1985. This assumption is only reasonable if wastage is stopped, a realistic pricing structure based on consumption is adopted and internal transfers are effected to enable water to be provided to low income households. Even then it is doubtful whether the number of households with on-plot water connexions will exceed 60 per cent.

821. The demand in 1980 can be met by the first phase of Sab Dam water (50 MGD) and the first three phases of Karachi Bulk Water Supply Scheme plus the 20 MGD Haleji supply. Demand in 1985 can be met by completion of the Sab Dam (100 MGD), further expansion of the Indus River supply system and the completion of the initial phases of waste water regeneration system.
The additional sources of water to be developed after 1985 will depend on the feasibility of regenerating urban waste water and will probably consist of a mix of Indus water, Hab River water and groundwater.

(b) Development of the future system

The proposed Metropolitan water supply programme is shown in Table XII.3.

| Table XII.3 |
| Water supply programme 1974-1985 |

<table>
<thead>
<tr>
<th>Existing system</th>
<th>Capacity (MGD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Third phase of the Karachi Bulk Water Supply Project (includes 25 MGD filter plant and 10 MGD service reservoir at northeast Karachi and a 25 MGD filter plant and 10 MGD service reservoir at Pipri Hills).</td>
<td>50</td>
</tr>
<tr>
<td>2. First phase of Hab water supply (includes 50 MGD filter plant and 30 MGD service reservoir to the west of North Karachi township).</td>
<td>50</td>
</tr>
<tr>
<td>Total source capacity 1980</td>
<td>280</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Fourth phase of the Karachi Bulk Water Supply Project (includes additional 70 MGD filter plant and 40 MGD service reservoir at Pipri bringing total capacity at Pipri to 120 MGD).</td>
</tr>
<tr>
<td>4. Second Phase Hab water supply (includes 50 MGD filter plant and 30 MGD service reservoir bringing total capacity from Hab to 100 MGD).</td>
</tr>
<tr>
<td>Total source capacity 1985</td>
</tr>
</tbody>
</table>

There is a need for careful further study of possible alternative distribution systems, but many components would be the same for all the systems. The currently favoured system, based on work initiated by the KDA, is shown in the diagram Karachi Metropolitan Area: Water Supply, 1985. In this initial design over 130 miles of trunk mains would be required, mainly in the east and northwest, with diameters ranging from 24 inches to 84 inches. Over 200 MGD of service reservoir capacity is proposed.
825. If the water regeneration system proposed in Chapter VII is feasible, the 70 MGD of the fourth phases of the Karachi Bulk Water Supply Project could be made available for urban or rural development elsewhere in the Region.

826. The estimated capital costs by 1980 are Rs.110.8 crores including Rs.22.5 crores in foreign exchange. An additional Rs.96.8 crores are estimated for capital investment 1980-1985 with Rs.34.0 crores in foreign exchange. The combined capital cost 1974-1985 is Rs.207.4 crores including Rs.56.5 crores in foreign exchange.

2. Sewage

827. Sewage flow is correlated with water supply; from an analysis of the water demand figures it has been calculated that approximately 70 per cent of the water supply could be captured into the sewage system by 1985.

828. The City has been subdivided into eight sewage districts with the intention of a sewage treatment plant serving each district. The resulting 1985 sewage flow has been calculated together with the capacity of the treatment plant required. The population served and capacity required of each plant are presented in Table XII.4.

<table>
<thead>
<tr>
<th>Number of treatment plant</th>
<th>Location</th>
<th>Capacity (MGD)</th>
<th>Population served (million)</th>
<th>Existing treatment capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S.I.T.E.</td>
<td>70.5</td>
<td>2.09</td>
<td>20.00</td>
</tr>
<tr>
<td>2</td>
<td>Mithiabad</td>
<td>57.4</td>
<td>1.11</td>
<td>20.00</td>
</tr>
<tr>
<td>3</td>
<td>Scheme 31</td>
<td>19.1</td>
<td>0.58</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Khannu/Pipri</td>
<td>27.2</td>
<td>0.82</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Urigh Colony</td>
<td>21.2</td>
<td>0.35</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Korangi</td>
<td>51.1</td>
<td>1.06</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Arangani Township</td>
<td>17.8</td>
<td>0.40</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Baldia</td>
<td>7.8</td>
<td>0.29</td>
<td>-</td>
</tr>
</tbody>
</table>

829. Vast areas of the City are without an adequate reticulation system and it will be necessary to lay down a sewage network if the trunk sewers are to be utilized.

830. It has been assessed that there will be somewhere between 80,000 and 90,000 acres urbanized by 1985. At the present time approximately 25 per cent of this is served by a sewage reticulation system. Between 50,000 and 70,000 acres and 800,000 households will therefore require a reticulation network by 1985 if the entire City is to be covered. The system proposed is shown in the map Karachi Metropolitan Area: Sewage 1985. Treatment Plant 8 is an alternative to Treatment Plant 7 and is not included in the capacity analyses or cost estimates for this reason.
The sewerage system costs are presented in Table XII.5. The figures for reticulation include approximately PRs.35 crores for approximately 800,000 house connexions.

Table XII.5


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foreign</td>
<td>Local</td>
<td>Foreign</td>
<td>Local</td>
</tr>
<tr>
<td>Treatment plants</td>
<td>17.0</td>
<td>22.0</td>
<td>23.0</td>
<td>32.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trunk sewers</td>
<td>1.5</td>
<td>7.5</td>
<td>2.8</td>
<td>11.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reticulation system</td>
<td>3.5</td>
<td>34.5</td>
<td>6.0</td>
<td>51.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>22.0</td>
<td>64.0</td>
<td>31.0</td>
<td>94.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Surface water drainage

832. The surface water drainage system proposed in the diagram Karachi Metropolitan Area: Surface Water Drainage, 1985. The system has been split up into zones of similar permeability. The percentage of permeability reflects the density of the area under consideration and consequently the surface water drainage design. Low density areas can have more open ditches than the higher density areas.

833. The estimated cost of surface water drainage works required within the urban area by 1985 is as follows:
- Flood control measures: PRs.1.5 crores
- Stream alignment and stability of banks: PRs.7.5 crores
- Gulleys and surface water reticulation: PRs.25.2 crores
- Total: PRs.34.2 crores

Of this sum, approximately PRs.20 crores will be required by 1980. The foreign exchange component will be approximately 10 per cent, or PRs.3.4 crores.

834. A sum of PRs.19 crores will be required in the rural areas of the Karachi command for the provision of canals, small dams and ditches.

4. Refuse

835. At the present time, approximately 1.2 lbs. of refuse is generated per head per day producing a total garbage generation of about 2,000 tons in 1973. By 1980 this figure will have reached 3,000 tons and by 1985 a total of between 3,500 and 4,000 tons per day will be generated.

836. If the present collection methods are continued approximately 1,500 new trucks will be required by 1985. Allowing for replacements based on a truck working life of six years, this would cost approximately PRs.13 crores.
Alternatively, large compaction type vehicles would be much more efficient and spend less time travelling to the tip. Approximately 300 heavy duty 20 cu. yd. compacting vehicles would be required costing approximately PRs. 7.9 crores if the compaction system were adopted.

837. Serious consideration should be given to the provision of composting plants at the sewage treatment plants. It is suggested that by 1985 two 20-ton-per-hour plants be installed at Treatment Plant J and Treatment Plant J (in the Mansoora site). Providing the composting stations worked for a 15-hour day, 640 tons of refuse per day could be composted. The cost of building the composting plants would be PRs. 4.5 crores.

838. The remainder of the refuse should be tipped by sanitary land fill methods and by 1985 at least five bulldozers (two equipped with scraper attachments) will be needed. Allowing for replacement, eight new machines will be required within the period 1974 to 1985 at a cost of PRs. 0.3 crores.

839. The remaining capital expenditure will result from the provision of refuse bins. The existing metal ones will require replacement; a further 2,000 will be required by 1985. The estimated cost of this is PRs. 0.1 crores.

840. The total capital costs of the proposed refuse collection programme (excluding land costs) are presented in Table XII.6.

### Table XII.6

<table>
<thead>
<tr>
<th>Item</th>
<th>PRs. crores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 300 heavy duty 20 cu.yd. compaction vehicles</td>
<td>7.0</td>
</tr>
<tr>
<td>2. Two 20-ton-per-hour composting plants</td>
<td>4.5</td>
</tr>
<tr>
<td>3. Eight bulldozers</td>
<td>0.3</td>
</tr>
<tr>
<td>4. Refuse bins</td>
<td>0.2</td>
</tr>
<tr>
<td>5. Landscaping, culverting and recovery of land</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13.5</strong></td>
</tr>
</tbody>
</table>

5. User charges

841. It is essential to the solution of the water, sewerage and solid waste problem that user charges for water be increased to enable the costs of the water, sewerage and solid waste disposal services to be recovered and to establish a steady stream of income in excess of costs. After the establishment of the proposed Water Supply and Environmental Sanitation Authority the on-site costs of water, sewerage and solid waste disposal facilities in housing projects could be charged to the new Authority.
After allowing for maintenance and other recurring costs, it is probable that an average charge will have to be levied of between PKR.5 and PKR.7 per 1,000 gallons of water consumed. A minimum charge of PKR.10 per month for the first 1,000 gallons could be made to low-income households and a differential tariff adopted for other users. Consideration should be given also to increasing the rate for bulk users.

D. IMMEDIATE ACTION

A series of immediate tasks for water supply and environmental sanitation has been identified in Chapter III -- water supply optimization, sewerage optimization, the installation of critical surface water drainage and flood control, upgrading of refuse collection and disposal, immediate execution of a regional water resource development feasibility study and the establishment of a Metropolitan Water Supply and Sanitation Authority to operate on a commercial basis. In addition to these imperatives a series of long-term actions should be initiated now.

1. Project design and feasibility analysis

Intensive project design and feasibility analysis for water supply, sewerage, drainage, river management and refuse should be initiated in 1974 as a basis for launching an integrated water supply and environmental sanitation programme for 1975-1985. As an essential part of this, alternative system designs for water supply and sanitation should be examined and evaluated in depth, as a basis for both domestic and foreign-aid funding. Arrangements for the necessary technical assistance should be made as soon as possible.

2. Meter installation

Preparations should be made for the extensive meter installation that will be essential to the achievement of an efficient water supply and sewerage system. Plans should be made now for establishing and staffing a meter workshop for this.

3. Staff training

An intensive staff training and retraining programme should be launched in 1974 to make it possible to achieve proper system planning, operation and maintenance.

4. Public information

An intensive public information programme should be launched in 1974 to heighten public awareness of the importance of basic improvements in water supply and sanitation and to prepare them for the changes in operating procedures and increase in prices that must occur.
3. Planning, review and implementation procedures

There should be established immediately planning, review and implementation procedures by which the planning and installation of water supply and environmental sanitation facilities can be co-ordinated fully with the development proposed in the Development Plan. As part of this, there must be proper co-ordination with land development, road construction and improvements and the installation of electricity, gas and communication facilities to avoid the extremely wasteful and disruptive practices that have been associated with independent utility installation in the past.
ELECTRICITY AND GAS

XIII.1 ELECTRICITY

A. TRENDS AND ISSUES

Electricity supply in the Karachi Region is the responsibility of the Karachi Electric Supply Corporation (KESC), a semi-public body with a licensed area of 940 square miles encompassing all of the Karachi-Dhabeji/Gharo irrigation. KESC supplies electricity not only to Karachi but also to Thatta, Kotri and Hyderabad.

1. Consumption

In 1970 industrial users were by far the largest consumers of electricity, with 61 per cent of all consumption. Residential consumption was only 13 per cent of all consumption. It is estimated that a population of approximately 1,700,000 was served in 1970, or 49 per cent of an estimated total population of 3,500,000. Average monthly consumption is presented in Table XIII.1.1.

Table XIII.1.1
Average monthly electricity consumption, 1970

<table>
<thead>
<tr>
<th>User</th>
<th>Million watt hours</th>
<th>Percentage</th>
<th>Coefficient of increase relative to 1961 demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>148 842</td>
<td>13</td>
<td>2.85</td>
</tr>
<tr>
<td>Commercial</td>
<td>138 950</td>
<td>12</td>
<td>3.00</td>
</tr>
<tr>
<td>Industrial</td>
<td>692 866</td>
<td>61</td>
<td>4.90</td>
</tr>
<tr>
<td>Street</td>
<td>9 415</td>
<td>1</td>
<td>2.25</td>
</tr>
<tr>
<td>Lighting</td>
<td>146 998</td>
<td>13</td>
<td>4.10</td>
</tr>
<tr>
<td>Others</td>
<td></td>
<td></td>
<td>4.00</td>
</tr>
<tr>
<td>Total</td>
<td>1 137 071</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Karachi Electric Supply Company
2. Power generation and transmission

851. Electric power is generated in four power stations.

<table>
<thead>
<tr>
<th>Station</th>
<th>Capacity</th>
<th>Source of Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Wharf</td>
<td>93 M.W.</td>
<td>Diesel oil</td>
</tr>
<tr>
<td>Korangi Creek</td>
<td>257 M.W.</td>
<td>Sui gas</td>
</tr>
<tr>
<td>SITE</td>
<td>10 M.W.</td>
<td>Sui gas and diesel oil</td>
</tr>
<tr>
<td>Hawkes Bay</td>
<td>125 M.W.</td>
<td>Nuclear fission</td>
</tr>
<tr>
<td>Total Capacity</td>
<td>485 M.W.</td>
<td></td>
</tr>
</tbody>
</table>

A fourth power unit at Korangi included in the Fourth Five Year Plan is not expected to be commissioned prior to 1976, and this is likely to create power shortages in the near future.

852. There are at present seven 132/11 kV and six 66/11 kV step-down stations linked primarily by a system of overhead transmission lines. The system is geographically extensive, permitting expansion of the urban area in virtually any direction without incurring the high capital costs that would be associated with the extension of the transmission system into an area previously unserved.

3. Tariffs

853. The tariff structure as it existed in 1969/1970 is presented in Table XII.1.2. Tariffs were increased recently by an average of 20 per cent. These figures are therefore slightly out of date, but they are representative of the tariff structure as it has influenced consumption in the recent past.

854. At present the cost of a connexion and wiring for a low-income household or a small firm is very high. For example, the cost of wiring a two-room unit with bathroom and WC to minimum standards may be as high as PRs.300 and the connexion charge is PRs.300. The total amount required at the time of connexion could therefore be as high as PRs.600, plus a security deposit of PRs.120, or PRs.720. Pricing policies must be developed that will allow services to be provided to a larger number of consumers. One way worth considering is to increase unit charges and decrease connexion charges for small consumers.
<table>
<thead>
<tr>
<th>User</th>
<th>Tariff 1969/1970</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industrial</strong></td>
<td></td>
</tr>
<tr>
<td>Up to 30 K.W.</td>
<td>14 paisas per unit</td>
</tr>
<tr>
<td>installed capacity</td>
<td></td>
</tr>
<tr>
<td>Above 50 K.W.</td>
<td>PRs.16.50 per K.W. of maximum demand plus 7.2 paisas per unit</td>
</tr>
<tr>
<td>installed capacity</td>
<td></td>
</tr>
<tr>
<td>Above 100 K.W.</td>
<td>PRs.15 per K.W. of maximum demand plus 6.6 paisas per unit</td>
</tr>
<tr>
<td>installed capacity</td>
<td></td>
</tr>
<tr>
<td>Above 1 000 K.W.</td>
<td>PRs.13.50 per K.W. of maximum demand plus 6.2 paisas per unit</td>
</tr>
<tr>
<td>installed capacity</td>
<td></td>
</tr>
<tr>
<td><strong>Commercial</strong></td>
<td></td>
</tr>
<tr>
<td>Up to 50 K.W.</td>
<td>22 paisas per unit</td>
</tr>
<tr>
<td>installed capacity</td>
<td></td>
</tr>
<tr>
<td>Over 50 K.W.</td>
<td>PRs.16.50 per K.W. of billing demand plus 5 paisas per unit</td>
</tr>
<tr>
<td>installed capacity</td>
<td></td>
</tr>
<tr>
<td>Over 100 K.W.</td>
<td>PRs.15.00 per K.W. of billing demand plus 7.5 paisas per KWH</td>
</tr>
<tr>
<td>installed capacity</td>
<td></td>
</tr>
<tr>
<td><strong>Residential</strong></td>
<td>First 50 KWH, 20 paisas per unit, excess of 50 KWH, 15 paisas per unit</td>
</tr>
<tr>
<td><strong>Connexions</strong></td>
<td>Varies with type of connexion. In general, the user is asked to cover most of the cost of connexion, i.e., little of the cost is financed out of unit consumption charges. For residential connexions, costs vary from PRs.300 to PRs.400, most being close to PRs.300.</td>
</tr>
</tbody>
</table>

Source: Karachi Electric Supply Company

*Prompt Payment Charge: 10 per cent is added to the bill and discounted if payment is made within 15 days of the date of billing.
4. Financing

Progress with ESCAP's previous development proposals has been delayed due to unstable conditions and difficulty in obtaining foreign exchange. An Asian Development Bank loan of SUS 26.5 million was obtained in February 1973 to cover the cost of the fourth unit at Korangi Power Station, and contracts have been awarded for construction, but costs are expected to be substantially in excess of the original estimate. A supplemental loan of SUS 9.0 million has been applied for to cover the increase.

B. OBJECTIVES

The following objectives are recommended for electricity.

(a) To extend basic electricity services to as large a percentage of metropolitan households as possible by 1985, and at the same time achieve adequate services for industrial, commercial and other non-residential purposes. In providing residential services to give highest priority to low-income households and small firms.

(b) To establish pricing and financing policies for electricity that will support the equity aims of the Development Plan and, at the same time, make it possible to operate the system on a commercial basis.

(c) To support the achievement of an adequate water supply, proper environmental sanitation and efficient use of urban and regional wastes by integrating the development of the electricity system needed for pumping and waste treatment fully with the development of the water supply and environmental sanitation system.

C. THE PROGRAMME FOR 1974-1985

The networks to be developed up to 1985 are shown in the map Karachi Metropolitan Area: Electricity and Gas 1980 and 1985.

1. Electricity connexions

A total of 700,000 electric connexions for households are targeted for 1980. These would represent 74 per cent of households, a substantial increase over the present 49 per cent.

2. Electricity demand forecasts

The growth of demand for electricity is expected to be spectacular, as can be seen from Table XIII.1.3, Electricity demand and supply 1965-1980.

The forecast peak demand includes 179 MW for the Steel Mill and 128 MW for Baluchistan and Hyderabad.
Table XIII.1.1
Electricity demand and supply 1965-1980

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Forecast</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Installed capacity MW</td>
<td>201</td>
<td>392</td>
<td>485</td>
</tr>
<tr>
<td>Firm capacity MW</td>
<td>135</td>
<td>267</td>
<td>360</td>
</tr>
<tr>
<td>Peak demand MW</td>
<td>129</td>
<td>254</td>
<td>389</td>
</tr>
<tr>
<td>Units generated MW</td>
<td>n.a.</td>
<td>1,386</td>
<td>1,833</td>
</tr>
<tr>
<td>Units sold MW</td>
<td>n.a.</td>
<td>1,137</td>
<td>973</td>
</tr>
</tbody>
</table>

Source: Karachi Electric Supply Corporation


(a) Power stations

860. Due to the delay expected in the commissioning of the fourth unit at Korangi, a gas turbine plant of 50 MW capacity has been proposed to avoid short-term power shortages.

(b) Grid stations

861. A new 132 KV and a new 66 KV grid station are proposed to be constructed in the Federal "B" area and at Agha Khan Road, respectively. Five grid station additions are also proposed at Landhi, Gulshan, Mauripur, S.I.T.E., and Gidri.

(c) Transmission lines

862. Five transmission lines are proposed, the most important of which are located in the Federal "B" and S.I.T.E. areas.


863. During the period 1976-1980, the KEFC network is to undergo major additions and alterations in both the generation and transmission and distribution sectors. As much as 525 MW generating capacity, 400 MVA transmission capacity and 800 MVA distribution transformation capacity is to be added during this period.

(a) Power stations

864. The Karachi Steel Mill is expected to go into commercial operation in 1978; its maximum power demand is expected to increase progressively to 176 MW by 1980/1981. The total connected load of the Steel Mill will be about 120 MW. In order to meet this major load KEFC proposed to construct in 1978 a 200 MW generating station close to the Mill premises and to interconnect this station with the Karachi Grid.

865. A second power station is proposed for 1979, to bring the total Installed capacity and generation capacity to 1,880 MW and 880 MW, respectively.
(b) Grid stations

066. Seven 132 Kv and two 66 Kv new grid stations are proposed in the Fifth Plan. The most important of these are two 132 Kv stations at Deh Langhiji and Hab Dam to support agricultural development in the Gadap and Hab River areas, a station at Karachi Airport, 66 Kv stations in North Nazimabad and Muslimabad, a 132 Kv station in Jacob Lines and the conversion of a 66 Kv station in Malir Cantonment to 132 Kv proposed for the Scheme 33 area.

067. It is recommended elsewhere in this report that only a part of the Scheme 33 area be developed by 1985, and that the remainder of the area be developed much more slowly than was originally planned. The timing of the proposed 132 Kv grid station should be reconsidered to reflect the final development proposals for the area.

(c) Transmission lines

068. Eleven transmission line projects are proposed, the most important of which include lines between Valika and Landhi via Malir, from Queens Road to Landhi, to Karachi Airport Grid Station, to Deh Langhiji and Hab Dam, to the Steel Mill Grid Station, from Queens Road to the West Wharf Grid Station, and to the Muslimabad, North Nazimabad and Jacob Lines Grid Stations.


069. Generation capacity is by far the largest component of expected costs, as shown in Table XIII.1.4, KESC development estimates to 1980.

<table>
<thead>
<tr>
<th>Table XIII.1.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>KESC development estimates to 1980</td>
</tr>
<tr>
<td>(Rs. crores)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Foreign currency</th>
<th>Local currency</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission lines and grid stations</td>
<td>26.25</td>
<td>10.60</td>
<td>390.85</td>
</tr>
<tr>
<td>Distribution</td>
<td>23.67</td>
<td>51.39</td>
<td>77.06</td>
</tr>
<tr>
<td>Generation</td>
<td>135.08</td>
<td>75.40</td>
<td>210.48</td>
</tr>
<tr>
<td></td>
<td>187.00</td>
<td>145.39</td>
<td>332.39</td>
</tr>
<tr>
<td>Connection expenses</td>
<td>1.00</td>
<td>6.50</td>
<td>7.50</td>
</tr>
<tr>
<td></td>
<td>188.00</td>
<td>151.89</td>
<td>339.89</td>
</tr>
</tbody>
</table>

Source: Karachi Electric Supply Company and Karachi Project

070. The estimates exclude the cost of the Kotri/Karachi transmission line which will cover a distance of approximately 100 miles and cost approximately Rs.8 crores including Rs.3 crores for foreign exchange.
KESC does not forecast costs beyond the next Five Year Plan, but such estimates are desirable for purposes of long-range planning. Projections made by the Master Plan Department based upon the 1972/1973 expenditures of KESC suggest total expenditures of Rs. 559 crores for the period 1974/1975-1984/1985. These have been used in the remainder of this report for purposes of long-range expenditure accounting.

D. IMMEDIATE ACTION

1. Programme review and planning co-ordination

872. An intensive review should be made of existing 1972-1980 programmes for electricity, in collaboration with the Master Plan Department, to co-ordinate the development of the system as fully as possible with the socio-economic and physical development envisioned in the Development Plan.

873. An attempt should be made to determine whether planning for electricity can be shifted from a "capacity-to-supply" emphasis toward demand-fulfillment so that the development of the system can approximate more closely the population and economic growth foreseen in the Development Plan.

2. Pricing and financing

874. A review should be made of pricing and financing policies and procedures for electricity with a view to establishing pricing and financing that will support as fully as possible the equity aims of the Development Plan. The possibility of reducing connexion charges for small consumers should be considered. The possibility of arranging credit for low-income households and small firms to help them to overcome the high initial installation charges also should be examined; credit for this purpose might be made part of the credit packages to be proposed as a key part of the housing programme and the industry and commerce programme.

XIII.2 GAS

A. TRENDS AND ISSUES

875. Gas is distributed within Karachi by the Karachi Gas Company, a semi-public body which was formed in August 1957. The Karachi Gas Company is supplied gas by the Sui Gas Transmission Company, which is responsible for the development of the country gas fields and transmission of gas to users.
1. The advantages of natural gas

Gas is by far the most efficient fuel for many uses. It is clean and relatively safe. The use of gas for domestic purposes and in small manufacturing plants would reduce the use of firewood and charcoal and increase the likelihood that a successful programme of afforestation could be carried out in the Karachi Region. Furthermore, the foreign exchange costs of natural gas are relatively low compared to those of electricity or oil products. The comparative costs of alternative fuels in units corresponding to 1,000 cubic feet of natural gas are presented in Table XIII.2.1.

Table XIII.2.1
Costs of alternative fuels (units equivalent to 1,000 cubic feet of natural gas, prices 1974/1975)

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Quantity</th>
<th>Units</th>
<th>Costs (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural gas</td>
<td>1,000.00</td>
<td>cu.ft.</td>
<td>6.40</td>
</tr>
<tr>
<td>Firewood</td>
<td>143.38</td>
<td>lbs.</td>
<td>21.51</td>
</tr>
<tr>
<td>Charcoal</td>
<td>62.74</td>
<td>lbs.</td>
<td>18.82</td>
</tr>
<tr>
<td>Kerosene</td>
<td>6.31</td>
<td>gallons</td>
<td>20.51</td>
</tr>
<tr>
<td>Burshane gas</td>
<td>1.62</td>
<td>cylinders</td>
<td>32.40</td>
</tr>
<tr>
<td>Electricity</td>
<td>200.00</td>
<td>KWH.</td>
<td>46.00</td>
</tr>
</tbody>
</table>

Source: Karachi Gas Company

2. The distribution system

At present the Karachi Gas Company operates a 770-mile system of supply mains, distribution networks and service connexions ranging in diameter from 3/4 inches to 20 inches and serving various parts of the city such as Landhi, Korangi, S.I.T.E., West Wharf, Nazimabad, Saddar and Kharadar. The Company provides gas to about 73,000 consumers of various types.

3. Consumption

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of consumers</th>
<th>Consumption (Million cu.ft. per annum)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Industrial</td>
<td>Commercial</td>
</tr>
<tr>
<td>1960/61</td>
<td>308</td>
<td>770</td>
</tr>
<tr>
<td>1961</td>
<td>452</td>
<td>1,257</td>
</tr>
<tr>
<td>1965/66</td>
<td>588</td>
<td>1,771</td>
</tr>
<tr>
<td>1970/71</td>
<td>618</td>
<td>2,092</td>
</tr>
</tbody>
</table>

Source: Karachi Gas Company

879. Gas is made available at different pressures to various classes of consumers. Supplies to domestic and commercial consumers are made at 8" w.c. whereas industrial consumers receive gas at a maximum pressure of 8 p.s.i.g.

890. Consumption is presently supply-constrained. If the supply constraints were removed, the present average consumption would be of the order of 97 million cu.ft. per day with the peak load nearing 120 million cu.ft. per day.

4. Sourceworks and transmission

891. In July 1952, large reserves of natural gas were discovered at Sui, which is located 347 miles north of Karachi in the province of Baluchistan. Subsequently more gas was found at Zin, Uch, Kandhok, Hundi, Sari Singh and other areas, bringing the country's total recoverable reserves including Sui to 16.73 million million cu.ft.

892. The Sui-Karachi pipeline for transmission of gas to Karachi was laid in 1955. At that time it was Asia's first 16" diameter high pressure pipeline. The initial free flow capacity of the pipeline was 95 million cu.ft. per day. This was increased in 1966 to 110 million cu.ft. per day by the installation of compressors. This capacity was soon saturated and in 1967 more compressors were installed enhancing the capacity of the pipeline to 140 million cu.ft. per day.

893. In addition to the Karachi Gas Company the Indus Gas Company also uses gas supplied by the Sui-Karachi pipeline. The quantity of gas supplied to each is determined by allocation. In 1970 the Karachi Gas Company was allocated 90 million cu.ft. per day. This was subsequently reduced to 80 million cu.ft. per day. The Indus Gas Company is allocated the remainder of 60 million cu.ft. per day.
894. RGSC presently is forced to resort to load shedding to avoid consumption in excess of the allocated amount. This situation is likely to become worse until additional capacity can be added to the transmission line.

3. Tariff structure

895. The Company charges the following rates from domestic and commercial consumers:

(i) Domestic: PRs.6.40 per 1,000 cu.ft.
   (Maximum charge of PRs.10.00 per month)
(ii) Commercial: PRs.6.88 per 1,000 cu.ft.
   (Minimum charge of PRs.30.00 per month)

896. For industrial consumers the rate varies from PRs.2.95 per 1,000 cu.ft. to PRs.3.73 per 1,000 cu.ft.

897. The government has sanctioned a special rate for ESC and cement factories. The rate varies from PRs.2.14 to PRs.3.13 per 1,000 cu.ft.

898. Meter rent varies with the size of the meter. For domestic consumers it has been fixed at PRs.1.00 per month.

899. The Company bears the cost for providing service connections and regulating and metering facilities. The cost of internal installation and appliances is borne by the consumer.

900. The Company has approved a number of contractors who carry out internal installation in commercial and domestic premises. Industrial installations are generally undertaken by the Company at the consumer's expense.

B. OBJECTIVES

901. The following objectives are suggested for gas:

(a) To extend basic gas services to as large a percentage of metropolitan households as possible by 1985 and, at the same time, to achieve adequate services for manufacturing, commercial, electricity and other non-domestic purposes. In providing residential services to give highest priority to low-income households and small firms.

(b) To establish pricing and financing policies that will support the equity aims of the Development Plan and, at the same time, to continue to operate the utility successfully on a commercial basis.

(c) To support the achievement of adequate water supply, proper environmental sanitation and efficient use of urban
and regional wastes by integrating the development of gas
needed for pumping and waste treatment fully with the de-
velopment of water supply and environmental sanitation.

(d) To provide sufficient quantities of gas to Karachi
from upcountry sources to support the expected level of
development of the City without creating supply shortages
that could lead to loss of output or curtailment of services.

C. THE PROGRAMME FOR 1974-1985

902. The networks and service areas to be developed up
to 1985 are shown in the diagram Karachi Metropolitan Area:
Electricity and Gas 1980 and 1985. The programmes proposed
are described below.

1. Connexions

903. A total of 350,000 gas connexions for households are
targeted by 1985 (including existing connexions), representing
29 per cent of all households. In order to achieve this
target it is proposed that the Company connect consumers at
the rate of 20,000 per annum for the remainder of 1974 and
at an average rate of 23,000 per annum and 30,000 per annum
during the periods 1975-1980 and 1980-1985, respectively.

(a) Special projects

904. In addition to the expansion programme outlined above
the Company plans to supply gas to the following large-volume
consumers during the period 1974-1985:

<table>
<thead>
<tr>
<th>Consumer</th>
<th>Expected Year of Gas Supply</th>
</tr>
</thead>
</table>

Source: Karachi Gas Company

2. Gas consumption forecast

905. The Company has based its gas demand forecast on the
normal rate of expansion as well as the materialization of
special projects on schedule.

906. During the financial year 1984-1985 the Company
expects consumption of 137,480 million cu.ft. The total
consumption forecast is as follows:
<table>
<thead>
<tr>
<th>Year ending</th>
<th>Domestic</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Total annual sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>1,901</td>
<td>1,323</td>
<td>35,664</td>
<td>38,886</td>
</tr>
<tr>
<td>1980</td>
<td>4,287</td>
<td>1,673</td>
<td>82,596</td>
<td>97,586</td>
</tr>
<tr>
<td>1985</td>
<td>7,212</td>
<td>2,023</td>
<td>128,245</td>
<td>137,480</td>
</tr>
</tbody>
</table>

907. Projected 1985 sales will be 93.3 per cent industrial, 8.2 per cent domestic and 1.5 per cent commercial.

3. Expansion of the sourceworks and transmission system

908. Plans have been finalized to lay another 18-inch diameter transmission line on the west bank of Indus river from Sui to Karachi via Sari Singh so as to bring additional quantities of natural gas to the southern region of the country. It is expected that the first phase of this project will be completed by October 1974. This would make an additional 12 million cu.ft. per day available to the Company and in turn to the city. The project from Sari Singh to Sui is scheduled to be completed by 1976. The additional free flow capacity of the duplicate Sui-Karachi pipeline would be 135 million cu.ft. per day. It is expected that the installation of compressors on the line would increase its capacity to roughly 200 million cu.ft. per day, for a total capacity of 140 million cu.ft. per day.

909. It is likely that a portion of the additional capacity will be allocated to the Indus Gas Company. Even if all the additional capacity is allocated to Karachi, more capacity could be required by 1980/1981. It is important therefore that planning for further construction be initiated as soon as possible.

4. Training for manpower requirements

910. Karachi Gas Company operates an Apprenticeship Training Programme in which apprentices are recruited and trained in various trades to fulfill the requirements for technicians. Qualified engineering graduates are employed as Trainee Engineers. On the completion of their training, they take up regular jobs in the various engineering departments of the Company. The Company periodically enrolls members of the managerial staff in various management courses.

5. Research and development, meter assembly and local production

911. Most of the equipment and materials required for the system are presently imported from abroad, and a fairly large amount of foreign exchange is required for this purpose. The Research and Development Department of the Company has made serious efforts to develop local production capability and some items such as service tees, service valves,
appliance valves, gas appliances and domestic gas regulators, etc., are now being manufactured locally. The Company plans to set up a domestic gas meter assembly and manufacturing plant in collaboration with foreign manufacturers to meet the demand for domestic meters in Pakistan.

6. Consumer services

912. Karachi Gas Company operates a twenty-four hour Consumer Service Section. Consumers can call the Company at any time to attend to emergencies such as malfunctioning of appliances or leakages.


913. Capital expenditures for the period 1974-1985 are estimated at Rs. 32.95 crores. The breakdown of this amount in terms of local currency and foreign exchange is shown in Table XIII.2.3.

<table>
<thead>
<tr>
<th>Table XIII.2.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>KGC capital requirements 1974/1975 to 1984/1985 (Lakhs rupees)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Domestic currency</th>
<th>Foreign currency</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974/1975</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal expansion</td>
<td>116.00</td>
<td>42.25</td>
<td>158.25</td>
</tr>
<tr>
<td>Special projects</td>
<td>75.50</td>
<td>57.00</td>
<td>132.50</td>
</tr>
<tr>
<td>Total</td>
<td>191.50</td>
<td>99.25</td>
<td>290.75</td>
</tr>
<tr>
<td>Normal expansion</td>
<td>795.16</td>
<td>263.79</td>
<td>1,058.95</td>
</tr>
<tr>
<td>Special projects</td>
<td>306.00</td>
<td>201.00</td>
<td>507.00</td>
</tr>
<tr>
<td>Total</td>
<td>1,101.16</td>
<td>464.79</td>
<td>1,565.95</td>
</tr>
<tr>
<td>Normal expansion</td>
<td>1,052.53</td>
<td>386.54</td>
<td>1,439.07</td>
</tr>
<tr>
<td>Special projects</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>1,052.53</td>
<td>386.54</td>
<td>1,439.07</td>
</tr>
<tr>
<td>Grand total</td>
<td>2,345.19</td>
<td>850.58</td>
<td>3,295.77</td>
</tr>
</tbody>
</table>

Source: Karachi Gas Company

D. IMMEDIATE ACTION

1. Programme review and planning co-ordination.

914. Due to the time constraints of the project it was not possible to fully integrate the gas programme proposals with the remainder of the Master Plan. An intensive review of the programmes should be made in collaboration with the Master Plan Department, to co-ordinate the development of the system.
as fully as possible with the socio-economic projections, physical development proposals and overall development policies of the Development Plan.

915. The planning for gas should be shifted from a "capacity-to-supply" emphasis toward demand-fulfillment so that the development of the system can approximate more closely the population and economic growth foreseen in the Development Plan.

2. Pricing and financing

916. A review should be made of pricing and financing policies and procedures with a view to establishing pricing and financing that will support as fully as possible the equity aims of the Development Plan.

3. Elimination of future supply shortages

917. A review should be made of the planning for expansion of the gas supply to Karachi and other regions. Projects should be scheduled so as to ensure the supply of adequate quantities of gas to the City without further shortages.

4. A national energy policy

918. A national energy policy should be established to ensure that Pakistan's natural resources are used in the most economic manner and that sufficient reserves are maintained for future use in all areas of Pakistan.
Chapter XIV

Urban Transport

319. Karachi accommodates its goods and passenger transport demand through the use of at least 15 different technologies involving more than 80,000 highway-related vehicles and 100 rail-related vehicles. These range from individualized services such as rickshaws and taxis through mini-buses, buses, high-capacity buses and railway services. Each of these services is provided at different frequencies and at different fare levels. This provides a multiple choice service that could be tailored to the needs of all user groups, but the deficiencies of the public transport system reduce the range of effective choice drastically.

320. For over ten years, there has been a severe deficiency in city bus services which has resulted in excessive waiting, extreme overcrowding, unsafe vehicles, ill-trained drivers, and extreme hardship on the "captive" ridership that cannot use other modes of transport. An indication of such severe deficiencies can be found in the high proportion of total urban trips that are made by foot or cycle.

321. The lower-income population groups are the people most seriously affected by the present deficiencies in the transport system. Transportation is difficult and costly for them, and this limits their opportunity to seek out new jobs and other urban experiences, as well as imposing a severe strain on their budgets.

322. The loss in road costs, vehicle costs, fuel costs, and accidents caused by the inefficiencies in the transportation system represents a constant drain on the City's economy.

A. 1971 Travel Demand

323. Table XIV.1 shows the numbers of trips made daily in the Karachi Metropolitan Area by travel mode and trip purpose. Table XIV.2 shows corresponding passenger mileage totals.
Table XIV.1
Karachi Metropolitan Area: daily person trips by mode and purpose, 1971

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Walk and cycle</th>
<th>Public transport</th>
<th>Private transport</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>732,000</td>
<td>355,000</td>
<td>177,000</td>
<td>1,242,000</td>
</tr>
<tr>
<td>Non-work</td>
<td>332,000</td>
<td>302,000</td>
<td>714,000</td>
<td>1,348,000</td>
</tr>
<tr>
<td>Total</td>
<td>4,064,000</td>
<td>1,257,000</td>
<td>891,000</td>
<td>6,252,000</td>
</tr>
</tbody>
</table>

a/ Bus, rail, tram and launch
b/ Car, motorcycle, taxi and rickshaw

Table XIV.2
Karachi Metropolitan Area: daily passenger miles by mode and purpose, 1971

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Walk and cycle</th>
<th>Public transport</th>
<th>Private transport</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>768,000</td>
<td>5,432,000</td>
<td>918,000</td>
<td>7,118,000</td>
</tr>
<tr>
<td>Non-work</td>
<td>1,195,000</td>
<td>1,075,000</td>
<td>3,348,000</td>
<td>5,778,000</td>
</tr>
<tr>
<td>Total</td>
<td>1,963,000</td>
<td>6,507,000</td>
<td>4,666,000</td>
<td>12,896,000</td>
</tr>
</tbody>
</table>

924. These figures show that nearly two-thirds of all trips and about 40 per cent of work trips are made on foot or by cycle, the vast majority being on foot. Nearly 60 per cent of all non-walk trips are by public transport, and nearly 85 per cent of non-walk trips are by public transport.

925. While many people live close enough to their places of employment to walk to work some longer walking trips are made by very low income people for whom public transport, if available, is expensive. The average work journey on foot is 1.05 miles long, much farther than people would walk if services were better.

926. Work trips by bus are shown in the map Karachi Metropolitan Area: Journeys to Work by Bus 1970.

927. One of the striking features of Karachi today is the fact that there are several areas of high population, notably North Karachi, Korangi and Malir-Model Colony, which are very far from centres of employment. Many of the residents of these areas must travel long distances to work, usually by public transport, adding considerably to the City's travel demands. As the City expands, these imbalances can be corrected, as proposed in Chapter VI,
1. Public transport

(g) The bus system

928. The bus system carries about half of the non-walk trips made in Karachi, and is the most important component of the City's transport system. Unfortunately it suffers from serious management, regulatory and administrative problems which result in levels of service and travelling conditions which are as bad as or worse than those anywhere in the world.

929. Services are provided by both private and public sector operators. In 1971 the Karachi Omnibus Service (KOS) provided the public sector services operated about 200 buses each day, while the many private bus owners operated about 700 buses. Both sectors operate their buses 14-16 hours per day, but the private sector buses appear to be operated more efficiently. The total of 900 buses was far below the number needed to meet normal demand. Extreme overcrowding, to the point of danger to bus passengers and other road users, and damage to buses, is commonplace. Breakdowns are frequent, spare parts are difficult to obtain, and buses are frequently unserviceable for long periods.

930. The KOS has acquired more than 1,000 new vehicles and 500 used vehicles in the last 15 years. Of this total, approximately 300 vehicles are currently operating.

931. Many of the public operators possess vehicles which are less than 5 years of age, but they experience extreme difficulty in keeping them roadworthy due to maintenance and administration deficiencies. The private sector possesses older buses (over one third over ten years old), but is much more successful in their maintenance.

932. The public operators have experienced shortfalls from 1970 to 1972 of Rs.314 lakhs or Rs.90 lakhs per annum.

933. In September 1972 the Karachi Planning Project reported that "... the private sector would seem to be in danger of contracting because of existing difficulties of operating urban services and poor financial return." There is evidence that this has happened during the past year. Many services on private buses now lie idle. The role of the private sector has been reduced from more than 1,200 operating buses in 1970 to approximately 650 in late 1973.

934. Three factors combine to prevent the improvement of the public transport situation. First, the fares charged to riders are too low to enable either public or private operators to provide acceptable levels of service. Second, Government has not established a policy for the role of the private sector or developed programmes to support it. As a result, operators encounter unnecessarily high expenses including much of the fuel tax, registration fees and unofficial payments demanded by the police. Third, attempts at public ownership and operation of bus transport have shown that the public sector is not an efficient supplier of bus services.
investment in bus transport is evidenced by the numerous new and excellently maintained private buses operating between Karachi and Hyderabad, and the large number of minibuses exploiting the inadequacy of the full-sized bus transport system. Fares must be raised and support provided for the private sector if public transport services are to be improved in Karachi.

(b) Urban rail system

936. The urban rail system is formed by the main line of the Pakistan Western Railway, which runs northeast from the port area past Digh Colony, Malir and Model Colonies, Landhi, Fisli and Dhaobi, and the Karachi Circular Railway, which runs from the main line at Dhal Cantoment through the northern parts of Karachi to the Sind Industrial Trading Estate and thence back to the port area. The railway services are utilized by 75,000 riders daily, 60,000 on the PWA main line and 15,000 on the Circular Railway.

937. Most of the railway infrastructure is of a quality and capacity that will permit sizeable increases in traffic without further investment. The service characteristics of both lines are worsened by poor management and scheduling.

(c) Trams

938. Diesel-powered trams are operated from Boulton Market, Soldier Bazaar and Cantoment Station to Express Market. The tram provides 44,000 riders with a downtown distributor system.

939. The permanent right-of-way of the facility is in need of renewal and betterment. The system is efficiently operated, and it provides an extremely valuable service.

2. The road system and other components of the transport system

(a) The road system

940. In contrast to the bus system, facing extreme and increasing overloads, Karachi has a road system far better than it needs. A good system of radial arterial roads is available, interconnected by numerous circumferential links, with wide, paved, well maintained routes which allow fairly easy and direct travel between most areas of the City. Some inner sections of the major radial routes experience periods of traffic congestion in peak hours, but these are not severe and are usually short-lived. Many sections of the road system, including the outer sections of some radial routes, have a capacity far in excess of that needed today, and these and other roads are often built in very wide road reservations that will enable wide, high standard routes to be developed in the future.

941. The 1971 total volume of road traffic is estimated at 1,671,000 passenger car equivalent (p.c.u.) miles. Its geographical distribution is shown in the map Karachi Metropolitan Area: 24 Hour Traffic Volumes 1971. Ninety-one per cent of the arterial road mileage could handle more traffic without physical improvement and only 57 per cent of the mileage the present volumes could be at least doubled before any improvement would be called for.
Despite this very satisfactory situation, the road system is constantly being extended and improved and many miles of multi-lane pavement have already been constructed which are almost devoid of vehicles for long periods each day. Such improvements are of doubtful benefit to the 13 per cent of work travel made by private transport modes, and of almost no benefit whatever to the 66 per cent made on the overloaded buses.

(b) Traditional modes

Motor rickshaws, tuk-tuks, victorias, camel carts and donkey carts are important elements of the transportation system for low-income groups.

They should be allowed to operate freely wherever possible without serious disruption of the flow of traffic.

(c) Traffic control

In contrast with the generally satisfactory state of the roads themselves, traffic is managed poorly. Signs and road markings for traffic control are little used; the police control of traffic is ineffective; and driver behaviour is generally very bad. Road space is used inefficiently, and accident rates are high. The situation could be improved at low cost by the use of signs and road markings as well as effective training and enforcement programmes to improve driver behaviour.

(d) Parking

At present private developers are required to provide extra parking space in the inner city. Cities in the more developed countries have learned by hard and costly experience that it is preferable to retain public control of parking space. This becomes an instrument for controlling traffic volumes and reducing road improvement costs.

(e) Pedestrian ways

Unfortunately, pedestrian ways are insufficient to provide minimal standards for the multitude of walk trips generated in the city. In 1971, 65 per cent of all trips were pedestrian-oriented. Although dedicated rights-of-way exist, the actual construction of facilities has been limited. At street crossings, traffic hazards are severe.

II. THE PRESENT AND FUTURE ROLE OF EACH TRANSPORT MODE

1. Public transport modes

(a) Buses

Buses are the most important component of the proposed public transport programme. They will play a very significant role in urban transport in Karachi, particularly up to 1985. Even if a fixed-rail system is constructed, it will only serve high-density corridors, with buses serving as part of the feeder system. It is likely that buses will
be required to carry at least half of public transport journeys even after construction of a fixed-rail system, as they do in Tokyo and London.

949. The flexibility of bus systems allows service areas and routes to be tailored to actual demand. However, the high frequency of stops and flexibility of operation limit the maximum capacity of a bus system. It would require three buses to handle the same hourly volumes as one light rail vehicle.

950. Buses have higher operating costs and lower capital costs than light rail modes, and they provide a greater number of employment opportunities. (It is estimated that a bus requires a support staff of 9-11 people, while a light rail vehicle requires only eight.) Ideally, buses should be used in very large urban areas as a supplement and general feeder to high-capacity rail modes.

951. Bus transport fares are currently a minimum of 10 paisa for three miles of transport, or 3.3 paisa per mile. By international standards this is an extremely low level. For example, fares are higher in Bangkok, Bombay, Kabul, Bogota, Lahore and Rawalpindi, all cities at generally comparable levels of development. It is estimated that the capital and operating costs of bus service average 6.5 paisa per passenger mile. It is not surprising, therefore, that the public system is run at a loss, that private operators are holding buses out of service and that private investors are not putting funds into buses in Karachi.

(b) Minibuses

952. Minibuses are proving popular and are increasing rapidly in numbers. There is clearly a short-term need that these vehicles are fulfilling but much of the demand arises because of the failure of the conventional bus system and, in particular, of the services operated by the public sector (KOS). In the medium and long term, the operation of minibuses needs to be carefully regulated in the context of the total bus operation to ensure that the economies of scale of conventional bus operations are not diminished.

(c) Trolley-buses

953. The trolley-bus was considered at one time in Karachi as a replacement for the bus. It has the advantages of rapid acceleration, silent and pollution-free operation and lower maintenance over the bus, but it has a number of disadvantages that outweigh the advantages.

954. Trolley-buses themselves cost no more than a bus, but they require in addition the overhead lines, which makes their total cost higher. One trolley-bus cannot overtake another. They are subject to de-wiring incidents, particularly at junctions, and when this occurs traffic congestion is likely to occur. Trolley-bus systems are not as flexible as bus systems: they cannot be re-routed quickly if demand changes suddenly. They cannot detour around accidents or blockages. They are subject to power failures and vulnerable to acts of war. Their operating costs are roughly equal to those of buses. Because the disadvantages outweigh the advantages trolley-buses are not recommended for Karachi.
(d) **Light railways**

955. Light railway systems, including conventional tramways, provide the urban area with the most highly efficient utilization of public street space. When such systems jointly share the street running surface with highway-related vehicles, they can provide the equivalent of three highway lanes of capacity. When light rail systems are provided on exclusive right-of-way, they can provide better than nine lanes of equivalent traffic capacity.

956. The capital cost for fixed rights-of-way and equipment are normally less than rapid transit modes. Although the capital costs for vehicles are much higher than for diesel city buses, the greater capacity per vehicle and the greater service life reduces the disparity between bus investment and light rail investment.

957. The non-electric diesel tram operating in the major commercial streets of Karachi provide an excellent, low-speed central city distributor system. These vehicles have characteristics permitting fast loading and discharge of passengers. They have the ability to make frequent stops at each major commercial area. With the indigenous capability of maintaining and constructing such vehicles, Karachi has available a mode which can provide more convenient and higher capacity operation through high-activity congested central city localities than would be possible with city buses. Such vehicles are more efficient in their use of street space than city buses when speed flows are under 10 MPH.

958. Light rail is expected to be the key public transport mode over the long run. The expansion of the system beyond the downtown area is not justified on economic grounds at present, but it could be by 1985.

(g) **Standard railway**

959. Standard railway infrastructure is an acceptable mode for longer distance, high-capacity urban passenger movements, particularly when existing rights-of-way can be utilized. In most cities, the primary difficulty is the extremely heavy investment required for commencement of service. In Karachi, two basic railway routes exist, and they can be utilized to reduce capital costs.

960. These facilities possess operating characteristics that can readily be adapted to provision of high-service standard for major passenger demand.

961. Such railway applications do suffer from continual conflicts between national goods/passenger movements and short-distance suburban passenger movements, but suburban movements can be accommodated in Karachi.

962. Three types of rolling stock were analyzed for future railway suburban operations. The existing type of independent locomotive with six to eight carriages was compared with diesel multiple-unit equipment and direct electric multiple-unit equipment. Costs were determined for a re-equipment programme under similar conditions for each set of equipment.
Summary of economic characteristics

A summary of the economic characteristics of various public transport vehicles is shown in Table XIV.3. All costs are for one vehicle (bus or tram) or car (rail or rapid transit) and include no right-of-way costs.

Table XIV.3

<table>
<thead>
<tr>
<th>Unit cost of vehicle</th>
<th>Minibus</th>
<th>City bus</th>
<th>Express bus</th>
<th>Tram diesel</th>
<th>Tram electric</th>
<th>Rapid transit Elevated</th>
<th>Rapid transit Subway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital cost (Rupees)</td>
<td>54,000</td>
<td>145,500</td>
<td>145,500</td>
<td>85,000</td>
<td>1,310,000</td>
<td>1,200,000</td>
<td>2,200,000</td>
</tr>
<tr>
<td>Economic F.E.C.</td>
<td>32,400</td>
<td>94,800</td>
<td>94,800</td>
<td>70,000</td>
<td>1,200,000</td>
<td>1,828,000</td>
<td>1,828,000</td>
</tr>
<tr>
<td>F.E.C.</td>
<td>25,000</td>
<td>79,600</td>
<td>79,600</td>
<td>22,000</td>
<td>1,090,000</td>
<td>1,371,000</td>
<td>1,371,000</td>
</tr>
</tbody>
</table>

Operating cost (Rupees per thousand vehicle miles):

| Total               | 720 | 2,000 | 2,250 | 2,500 | 2,000 | 3,000 | 3,500 |
| Economic            | 170 | 1,250 | 1,350 | 1,250 | 2,250 | 2,750 | 3,750 |
| F.E.C.              | 100 | 500   | 500   | 200   | 1,500 | 2,000 |

Costs per occupied space:

| Total               | 3,898 | 2,870 | 2,870 | 1,130 | 6,390 | 11,000 | 11,000 |
| Economic            | 2,131 | 1,896 | 1,896 | 930   | 5,830 | 9,140  | 9,140  |
| F.E.C.              | 1,800 | 1,592 | 1,592 | 290   | 3,320 | 6,860  |

Operating cost (Rupees per thousand passenger miles):

| Total               | 52   | 40    | 45    | 33    | 15    | 18     | 18     |
| Economic            | 12   | 25    | 27    | 17    | 11    | 14     | 14     |
| F.E.C.              | 7    | 10    | 10    | 3     | 7     | 10     |

Time incurred (minutes per thousand passenger miles):

| 2,000 | 5,000 | 3,000 | 10,000 | 4,000 | 3,000 |

---

Economic cost equals total vehicle cost less taxes.
F.E.C. equals foreign exchange component.
Costs per occupied space are calculated on expected vehicle occupancies during peak hours.

2. Private transport modes

(a) Private car

The private car will drain taxes, capital resources, and foreign exchange. If the capital is not available for roads, congestion will be severe, leading to higher operating costs and foreign exchange requirements for both cars and buses. Failure to control private cars will lead to substantial income transfers from low- to high-income households. Experience elsewhere proves that it is not enough to improve public transport and hope that the majority will leave their cars at home.
965. Strong and direct measures are necessary to increase the out-of-pocket costs of individual car trips and thereby limit the number of trips. These measures include the limitation of parking space and charging, on an hourly basis, for that space.

966. The most effective means of saving resources and foreign exchange would be to maintain, or possibly increase, the controls on the import of private vehicles.

967. The forecasts of car-ownership and private travel are based on existing relationships between car-ownership and household incomes. They are thus influenced by past and present policies which, by import restrictions and/or high import taxes, limited the purchase of cars. The degree of change which could result if cars were freely available at relatively low cost is illustrated by data from London. During an eight-year period of rising incomes and car-ownership, the proportion of mechanized trips by private car and motorcycle increased from 12 to 48 per cent.

968. If the private car is to be controlled effectively, it follows that when a local motor manufacturing industry is developed it should not set the production of a cheap "people's" car as an important objective. Far more national benefit will result if the industry were focused on the production of buses, trucks, and perhaps bicycles, to meet national requirements and ultimately for export. Buses and trucks are much more important to the national economy than low-cost cars; they are currently in short supply and local production would save foreign exchange.

(b) Walking

969. Walking has the advantage of zero capital cost and foreign exchange components, but it has a high economic operating cost, second only to a large car, and the highest time cost. Nevertheless, with scarce capital resources and low values of time, there are advantages in making the maximum use of walking. The most effective means of doing this is by organizing the land use patterns in such a way that jobs are located as close as possible to residential areas. Similar considerations apply to shopping, social and recreational journeys.

(c) Cycling

970. Cycling is a mode that should be encouraged. It has a low capital cost and a low unit economic operating cost. The time cost is not much greater than that for a bus. It is an ideal mode for many short-distance journeys. There is a case for removing the taxes on the purchase of cycles (thus reducing the cost by one-third) and of investigating ways of substituting locally-manufactured items for those currently imported.

(d) Scooters and motorcycles

971. Scooters and motorcycles have advantages for short trips, but their characteristics also allow them to be used for medium and long trips. This leads to the creation of travel patterns and life-styles that are dependent on private transport modes.
As a factor in long-term transport planning for Karachi, therefore, this mode should be thought of as an interim solution. If tax concessions were made on pedal-cycles the revenue could be replaced by adding further tax on motorcycles and scooters. There would also be significant foreign exchange savings in both capital and operating costs.

(e) Autorickshaws

Autorickshaws provide a mechanical passenger mode that is capable of penetrating the narrow, isolated passageways within high-density, low-income neighbourhoods. As such, it provides sizeable numbers of Karachi's citizens with customized service. Larger autorickshaws operating over fixed routes with frequent service can provide low and medium-income neighbourhoods with a service quality that is higher than that of city buses.

The rickshaw is the only mechanized alternative open to people in many instances. It is nevertheless expensive for low-income households compared with adequate bus transport. The pollution and safety aspects of the vehicle are matters for concern, but both of these problems are solvable with proper vehicle inspection and traffic police enforcement of existing standards.

As drivers' wage costs increase, the fares will get closer to those of taxis. As this happens and as the low- and lower-middle-income households are better served by public transport, the market for rickshaws will decline. The rickshaw fleet should, therefore, be permitted to expand for the next six to eight years and then should be allowed to decline naturally.

(f) Taxis

The taxi is an important long-term private mode which, together with improved public transport, is the key to the acceptability of the control of private vehicle usage and ownership. There would be significant savings in the number of vehicles required (by a factor of six) and in the parking space required.

(g) Animal transport

Animal powered transport incurs little or no foreign exchange costs and provides major employment opportunities for uneducated, unskilled persons.

The role of small-scale and traditional modes of animal transport in urban transport will be substantial over most of the planning period. They contribute a positive benefit to the activities of the Metropolitan Area and should not be curtailed through administrative or legal restrictions. With continued economic development the gradual rise of wage rates (in real terms) will ultimately reduce the attractiveness of such labour-intensive systems.

Tongas provide low- and medium-income residents with a transport mode that can provide both fixed route and customized services. Such vehicles can be used for individual trips of special purpose or for public transport service along fixed routes. Fixed route tanga operations
currently provide 1,200 seats per direction per hour. These vehicles provide a type of public transport that is more convenient and more comfortable than is found in city bus service.

982. Victoria taxis are principally operated as non-mechanized taxis. These vehicles retain a social status with the local community that permits unmolested transport of women and young students throughout the central city area. Such vehicles are used for normal passenger needs and for carriage of bulky, high-value commodities.

981. Donkey carts and camel carts provide transport capacity for goods movement. These vehicles have low capital investment. As a result, the users of these modes find the costs of haulage to be competitive or cheaper for their needs than mechanized transport. This is particularly true when long periods of waiting for loading or discharge of cargo at port, warehouse, shop, or godown are experienced. Both modes operate with per-unit capacities that are more relevant to the transport needs of small merchants and industrialists.

983. **Summary**

982. Table XIV.4 summarizes the economic characteristics of private modes on a unit cost basis and on the basis of the vehicle capital costs incurred per rider and the vehicle operating costs incurred per thousand passenger miles.

983. Compared with public modes the operating costs per passenger mile of most private modes are substantially higher; the vehicle capital cost of cars, taxis and rickshaws per rider are also substantially greater than most public modes (the exception being rail rapid transit) and have very significant foreign exchange components. Scooters and motorcycles have lower capital costs but still cost much more per seat than a city transit bus. Thus, as a general rule, private modes are seen as fulfilling very low density transport movements.
### Summary of Economic Characteristics of Private Modes

<table>
<thead>
<tr>
<th></th>
<th>Walk</th>
<th>Cycle</th>
<th>Scooter</th>
<th>Motorcycle</th>
<th>Motorcar</th>
<th>Auto-rickshaw</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit Cost of Vehicle [a]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Capital cost (Rupees)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>2,000</td>
<td>2,700</td>
<td>22,700</td>
<td>29,800</td>
<td>62,400</td>
</tr>
<tr>
<td>Economic</td>
<td>200</td>
<td>1,800</td>
<td>2,300</td>
<td>17,500</td>
<td>24,700</td>
<td>40,000</td>
</tr>
<tr>
<td>F.E.C. [b]</td>
<td>80</td>
<td>1,800</td>
<td>2,200</td>
<td>15,000</td>
<td>21,200</td>
<td>35,500</td>
</tr>
<tr>
<td><strong>Operating Costs [c]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>50</td>
<td>170</td>
<td>160</td>
<td>360</td>
<td>500</td>
</tr>
<tr>
<td>Economic</td>
<td>100</td>
<td>50</td>
<td>170</td>
<td>160</td>
<td>360</td>
<td>500</td>
</tr>
<tr>
<td>F.E.C. [d]</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td><strong>Costs per Occupied Seat [e]</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Capital cost (Rupees per passenger space)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>1,665</td>
<td>1,365</td>
<td>12,876</td>
<td>16,334</td>
<td>33,041</td>
</tr>
<tr>
<td>Economic</td>
<td>200</td>
<td>1,665</td>
<td>1,365</td>
<td>12,876</td>
<td>16,334</td>
<td>33,041</td>
</tr>
<tr>
<td>F.E.C. [f]</td>
<td>100</td>
<td>1,665</td>
<td>1,365</td>
<td>12,876</td>
<td>16,334</td>
<td>33,041</td>
</tr>
<tr>
<td>2. Operating cost (Rupees per thousand passenger miles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>50</td>
<td>140</td>
<td>130</td>
<td>200</td>
<td>270</td>
</tr>
<tr>
<td>Economic</td>
<td>100</td>
<td>50</td>
<td>140</td>
<td>130</td>
<td>200</td>
<td>270</td>
</tr>
<tr>
<td>F.E.C. [g]</td>
<td>10</td>
<td>10</td>
<td>30</td>
<td>30</td>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>3. Time Incurred (minutes per thousand passenger miles)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20,000</td>
<td>1,000</td>
<td>2,400</td>
<td>1,700</td>
<td>1,700</td>
<td>1,700</td>
</tr>
</tbody>
</table>

---

[a] No right-of-way costs are included.
[b] Economic cost equals total less taxes.
[d] Operating cost includes depreciation and maintenance in all cases but excludes wages of drivers for walk, cycle, scooter, motorcycle and motorcar.
[e] Costs per occupied seat are calculated on observed average vehicle occupancies over 24 hours.

### C. 1985 Travel Demand Forecasts

The alternative transport systems proposed are based upon 1985 travel demand forecasts, which in turn are based upon the level of population, distribution of income, and the location of activities in Karachi.

In forecasting 1985 travel demands, two alternatives were examined. The first, referred to as the restrained situation, assumed that steps would be taken to bring about a change in present patterns of travel mode and the recent trends in these patterns. It is assumed that there would be a significant increase in the proportions...
people using public transport services, and a corresponding decrease in the proportions of walk trips and private transport trips. The decrease might be voluntary but additional measures will be necessary such as limiting parking space in high employment centres, imposing high parking charges, and charging increased fuel or vehicle registration taxes. Controls to make the purchase of private vehicles even more difficult or expensive than today are also available.

986. The second alternative examined is the unrestrained situation where it is assumed that public transport services will be improved, but only as needed to give the present standards of service to the increasing population. This would allow the present trend toward increasing use of cars, motorcycles, taxis and rickshaws to continue, while the role played by public transport would steadily decline.

987. The unrestrained situation would entail limited expenditure for public transport improvements, but would cause road traffic volumes to increase rapidly to the point where eventually considerable expenditure would have to be made for road improvement if the City's transport demands were to be satisfied and the City allowed to keep functioning.

988. The evaluation which follows concentrates on the road system which would be needed to meet the lesser demands of the restrained situation in 1985.

989. Separate forecasts were also made of public transport demand for each of the three public transport alternatives described later in this chapter.

990. Table XIV.5 shows demographic and car-ownership statistics for 1971 and 1985 for that part of the urban area for which traffic forecasts were made. The 1985 population of the urban area is nearly double that of 1971 and the number of cars in use is over three times the 1971 total.

| Table XIV.5 |

| Population, employment and car-ownership, 1971-1985 |

<table>
<thead>
<tr>
<th></th>
<th>1971</th>
<th>Development Plan 1985</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>3,440,000</td>
<td>6,770,000</td>
</tr>
<tr>
<td>Employment</td>
<td>1,060,000</td>
<td>1,070,000</td>
</tr>
<tr>
<td>Car-owning households</td>
<td>36,000</td>
<td>118,000</td>
</tr>
<tr>
<td>Non-car-owning households</td>
<td>535,000</td>
<td>1,060,000</td>
</tr>
<tr>
<td>Total households</td>
<td>571,000</td>
<td>1,788,000</td>
</tr>
<tr>
<td>Per cent households with cars</td>
<td>6.3</td>
<td>10.0</td>
</tr>
</tbody>
</table>

991. Table XIV.6 shows the numbers of work trips by major mode group under both the restrained condition (with much improved public transport) and under the unrestrained conditions (where public transport service levels are assumed unchanged).
The effects of better public transport are two-fold: about 15 per cent of walk trips are attracted to public transport, and about 20 per cent of private trips are induced to transfer from private modes to public transport. The latter effect is highly desirable because of the resulting reductions in road traffic volumes and the savings possible in road construction. Even in the restrained situation the number of work trips by private modes in 1985 is more than double the 1971 total.

Table XIV.6

<table>
<thead>
<tr>
<th>Mode</th>
<th>1971</th>
<th>1985 (Restrained)</th>
<th>1985 (Unrestrained)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk/cycle</td>
<td>732 000</td>
<td>1,225 000</td>
<td>1,428 000</td>
</tr>
<tr>
<td>Public transport</td>
<td>933 000</td>
<td>1,221 000</td>
<td>1,421 000</td>
</tr>
<tr>
<td>Private transport</td>
<td>177 000</td>
<td>391 000</td>
<td>488 000</td>
</tr>
<tr>
<td>Total</td>
<td>1,842 000</td>
<td>3,537 000</td>
<td>3,537 000</td>
</tr>
</tbody>
</table>

Table XIV.7

<table>
<thead>
<tr>
<th>Income group</th>
<th>Percentage of trips</th>
<th>Average trip length (miles)</th>
<th>All modes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Walk</td>
<td>Public transport</td>
<td>Private transport</td>
</tr>
<tr>
<td>Low</td>
<td>43</td>
<td>56</td>
<td>1</td>
</tr>
<tr>
<td>Medium</td>
<td>36</td>
<td>57</td>
<td>7</td>
</tr>
<tr>
<td>High</td>
<td>12</td>
<td>35</td>
<td>53</td>
</tr>
<tr>
<td>Total (1985</td>
<td>35</td>
<td>54</td>
<td>11</td>
</tr>
<tr>
<td>restrained)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (1985</td>
<td>40</td>
<td>46</td>
<td>14</td>
</tr>
<tr>
<td>unrestrained)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total (1971)</td>
<td>40</td>
<td>51</td>
<td>9</td>
</tr>
</tbody>
</table>

a/ Low: 0 to 299 rupees per month
Medium: 300 to 999 rupees per month
High: 1,000 rupees per month
The average of all work trips in 1985 (3.73 miles) is slightly below that of 1971 (3.86 miles) despite the increased size of the urban area. This illustrates one of the more important features of the Development Plan. By providing a better distribution of employment throughout the city, it will allow labour force members to select job locations from numerous job opportunities, many of which are close to their homes.

The effects of the improved distribution of employment achieved by the Development Plan are also seen in the desire lines for public transport and private mode work travel shown in the diagrams Karachi Metropolitan Area Private Transport Work Travel Desire Lines, 1985 and Karachi Urban Area Public Transport Work Travel Desire Lines, 1985. In these, the daily person movements between different parts of the urban area are shown by the relative widths of the bands joining these areas. Long distance movements are still present in large numbers, as they are in any large city, but they are no longer predominant. The influence of high-income groups in the Gizri Peninsula, Housing Societies, North Nazimabad/Federal "B" and Scheme 33 areas on private transport travel demand is evident in the diagram. The changes between the forecast patterns and the existing patterns are evident.

The public transport demands forecasts for 1985 are carried out in different ways for each public transport system examined. Table XIV-8 shows the number of work trips carried by each public transport mode. In each case the amount of travel by bus increases significantly, showing that the bus will remain an important component of the system no matter what future system is adopted. The trips carried by the rail/light rail system increase with the mileage added to the system and in the "all light rail" system reach a maximum of over 40 per cent of public transport trips.

Table XIV-8

<table>
<thead>
<tr>
<th>Mode</th>
<th>1971</th>
<th>1985</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>System A 2/</td>
</tr>
<tr>
<td>Bus</td>
<td>841 000</td>
<td>1 751 000</td>
</tr>
<tr>
<td>Light</td>
<td>10 000</td>
<td>0</td>
</tr>
<tr>
<td>Rail</td>
<td>62 000</td>
<td>170 000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>931 000</td>
<td>1 921 000</td>
</tr>
</tbody>
</table>

2/ System A: Improvements to existing rail.
3/ System B: Light Rail and Rail Rapid Transit.
5/ System C: Light Rail
997. Table XIV.7 shows the vehicle mileages on the road system generated by private goods vehicles and buses under the forecast 1985 conditions for Plan I. Here the bulk of the increase is due to private vehicles, and the effects of restraint are clearly apparent. In the restrained case the total vehicle mileage increases by 86 per cent between 1971 and 1985, of which over 77 per cent is due to private vehicles. The unrestrained case shows an increase of 162 per cent, of which 155 per cent is due to private vehicles. The demands on road system capacity are most directly expressed in terms of passenger car units (p.c.u.) and in these terms, the road capacity needed in 1985 will be 70 per cent higher than in 1971 if effective restraint measures are introduced, and 120 per cent higher with no restraint.

998. In 1985 even with restraint, private vehicles are responsible for 74 per cent of the road requirement, but carry only half of the passenger mileage carried on the road system. The effect of restraint is to enable the demand to be carried more efficiently, so reducing the need for expensive road system improvements. In 1985, restraint would reduce demand for road capacity by nearly 1.3 million p.c.u. miles, an amount equal to nearly 40 per cent of the 1971 total demand.

Table XIV.9

Daily vehicle miles by road: 1971-1985

<table>
<thead>
<tr>
<th>Vehicle type</th>
<th>1971</th>
<th>1985 Plan (restrained)</th>
<th>1985 Plan (unrestrained)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car</td>
<td>1,071,000</td>
<td>2,051,000</td>
<td>3,239,000</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>479,000</td>
<td>915,000</td>
<td>1,217,000</td>
</tr>
<tr>
<td>Taxi</td>
<td>568,000</td>
<td>844,000</td>
<td>1,155,000</td>
</tr>
<tr>
<td>Rickshaw</td>
<td>880,000</td>
<td>1,175,000</td>
<td>2,254,000</td>
</tr>
<tr>
<td>Bus</td>
<td>166,000</td>
<td>474,000</td>
<td>611,000</td>
</tr>
<tr>
<td>Goods vehicle</td>
<td>237,000</td>
<td>392,000</td>
<td>255,000</td>
</tr>
<tr>
<td>Tonga and victoria</td>
<td>20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,421,000</td>
<td>6,538,000</td>
<td>8,968,000</td>
</tr>
<tr>
<td>Equivalent p.c.u. miles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per cent of p.c.u. from private vehicles</td>
<td>64.3</td>
<td>67.6</td>
<td>81.2</td>
</tr>
</tbody>
</table>

D. ALTERNATIVE PUBLIC TRANSPORT SYSTEMS

999. Three alternative public transport systems were designed and tested using the traffic forecasting models. Each system was assumed to serve the same total demand, but the specific traffic loadings on individual components of the system vary depending upon the system.
KARACHI METROPOLITAN AREA
ROAD TRAVEL DEMANDS BY MODE • 1971 - 1985
1,001. The three alternatives are shown in the diagram. Karachi Metropolitan Area: Alternative Rail Systems Considered.

1,002. System A, the improvements to Existing Rail System, assumes that no new rail or light rail lines would be built, but that the capacity of existing rail lines would be increased sufficiently to serve increased demand by 1985. Buses would serve approximately 80 per cent of all public transport work traffic. The design of System A is to make maximum use of the existing rail system for long journeys within the area, particularly work journeys to the port and the Steel Mill.

1,003. In System A, the main line portion of PNR rail system is forecast to carry between 92,000 and 97,000 passengers a day in the section between Dhrigh Road and Karachi City Stations. The KCR is most heavily used in the northeastern part through Karachi Central Station.

1,004. The 1985 bus loadings in System A are very high in the busiest parts of the network around Saddar they read over 170,000 passengers per day, approximately 4,900 buses per day at reasonable occupancy levels and using the type of vehicle currently operated. Typical loadings throughout the network are between 48,000 and 80,000 passengers per day or 1,400 and 2,300 buses per day.

1,005. System B, the Light Rail and Rail Rapid Transit System incorporates a rapid transit spine, with a system of light rail lines feeding into the northern sections of the Circular Railway from the Scheme 33, North Nazimabad, Maucoota and North Karachi areas. Other light rail lines link Aurangabad and Baldia with the central City through S.I.T.E., and another line links Korangi and Landhi with the main railway lines at Dhrigh Colony and with the central City via Karachi Cantonment Station and Frere Street.

1,006. The rapid transit spine in System B attracts between 72,000 and 76,000 passengers per day. The more attractive service on the spine through Saddar diverts some rail trips from the main line, routing them through the western portion of the KCR where loadings increase to 128,000 compared to 100,000 in System C.

1,007. Although the rapid transit spine would carry heavy traffic, the benefits would not justify the extremely high costs involved. As an alternative, an All Light Rail System was also tested.

1,008. The third alternative, the All Light Rail System omits the rapid transit spine and replaces it with two light rail lines on approximately the same alignment as the spine and an additional light rail line between Liaquatabad and the City centre. In this case, the loadings are redistributed with an increase occurring on the main line rail system. The total flow on the two light rail lines is higher than the rapid transit loadings but the light rail system is carrying a higher volume of short and medium distance traffic.
1,009. In this plan the light rail loadings obtained in the main corridors lie between 60,000 and 100,000 passengers per day. Higher loadings are obtained on a limited number of links, the maximum being 240,000 in the heart of Saddar.

1,010. In most of the corridors examined the 1985 traffic loadings indicate that the light rail system would be appropriate in an engineering sense, but the economic analysis of the system shows that it would be premature to invest in such a system at this time.

1,011. System A appears to be the best alternative. The initial investment should be made primarily in the bus system and investment in the light rail system should be postponed to a later date.

2. Costs of alternative public transport systems

1,012. The economic analysis of the three alternative systems is based upon the travel forecasting procedures described previously. To simplify the analysis the rail system has been assumed to cost the same in each plan. The difference between the plans would not be significant at this stage of the analysis. The rail improvements are estimated to cost Rs.458 lakhs.

1,013. The rapid transit spine of System B is estimated to cost Rs.2,200 lakhs assuming an elevated structure over much of its length (four out of six miles). An underground system would cost three to five times as much as would an elevated system.

1,014. The other rail lines are estimated to cost Rs.1,100 lakhs in System B and Rs.1,770 lakhs in System C with the additional lines to replace the rapid transit spine.

1,015. No additional costs have been allocated to System A account for the increased use of highways by buses. The increased bus load in System A results in an increase of about 10 per cent in total p.c.u.'s in the highway system, but it is assumed that road investments would be required primarily to accommodate growth in private and commercial vehicle usage and that the additional bus traffic would be of marginal importance.

1,016. The scheduling of capital investment for each of the three plans will influence the discounted costs of each programme. Total costs and the scheduling of investment are shown in Table XIV.10, Infrastructure components of public transport system in alternative plans.
<table>
<thead>
<tr>
<th>Item</th>
<th>System A</th>
<th>System B</th>
<th>System C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cost</td>
<td>Date</td>
<td>Cost</td>
</tr>
<tr>
<td><strong>BRT Rail</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mainline - west</td>
<td>60.0</td>
<td>1977</td>
<td>60.0</td>
</tr>
<tr>
<td>Mainline - east</td>
<td>60.0</td>
<td>1978</td>
<td>60.0</td>
</tr>
<tr>
<td>KCR - east</td>
<td>65.0</td>
<td>1984</td>
<td>65.0</td>
</tr>
<tr>
<td>KCR - west</td>
<td>113.0</td>
<td>1984</td>
<td>113.0</td>
</tr>
<tr>
<td>Malir Branch</td>
<td>40.0</td>
<td>1982</td>
<td>40.0</td>
</tr>
<tr>
<td>Korangi Branch</td>
<td>40.0</td>
<td>1978</td>
<td>40.0</td>
</tr>
<tr>
<td>Pipri Port Extension</td>
<td>80.0</td>
<td>1979</td>
<td>80.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>458.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rapid Transit Spine</strong></td>
<td></td>
<td>2</td>
<td>200.0</td>
</tr>
<tr>
<td><strong>Light Rail Lines</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landhi - Korangi</td>
<td></td>
<td></td>
<td>160.8</td>
</tr>
<tr>
<td>Lrigh Colony - Korangi</td>
<td></td>
<td></td>
<td>80.4</td>
</tr>
<tr>
<td>Korangi - Saddar</td>
<td></td>
<td></td>
<td>241.2</td>
</tr>
<tr>
<td>Univ. Karachi Central</td>
<td></td>
<td></td>
<td>67.0</td>
</tr>
<tr>
<td>Karachi Central - Karachi City</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monara - Liaquatabad</td>
<td></td>
<td></td>
<td>120.6</td>
</tr>
<tr>
<td>Liaquatabad - Soldier Bazaar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soldier Bazaar - KPT</td>
<td></td>
<td></td>
<td>94.0</td>
</tr>
<tr>
<td>North Karachi - Karachi Central</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S.I.T.E. - Soldier Bazaar</td>
<td></td>
<td></td>
<td>94.0</td>
</tr>
<tr>
<td>Baldia - Lyari</td>
<td></td>
<td></td>
<td>107.2</td>
</tr>
<tr>
<td>Lyari - Frere Road</td>
<td></td>
<td></td>
<td>214.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1474.8</td>
<td></td>
<td>1474.8</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td>458.0</td>
<td></td>
<td>458.0</td>
</tr>
</tbody>
</table>

1.017. An estimate of the vehicle fleet required for each of the three plans is shown in Table XIV.11. It is based on the normal operating performance or load productivity for Karachi.
Table XIV.11

Public transport vehicle requirements and costs (PRs. lakhs)

<table>
<thead>
<tr>
<th>System</th>
<th>1985 Vehicle requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bus a/</td>
</tr>
<tr>
<td>System A</td>
<td>3 355</td>
</tr>
<tr>
<td>System B</td>
<td>2 185</td>
</tr>
<tr>
<td>System C</td>
<td>2 195</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System</th>
<th>Vehicle investment (PRs. lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>System A</td>
<td>4 147</td>
</tr>
<tr>
<td>System B</td>
<td>2 717</td>
</tr>
<tr>
<td>System C</td>
<td>2 717</td>
</tr>
</tbody>
</table>

a/ Bus requirements include 15 per cent spares.
b/ Rail requirements include 10 per cent spares.
c/ Tram requirements include 15 per cent spares.

1.018. The scheduling of vehicle acquisition over the plan period was related to the completion of the individual schemes. In the first three years it was assumed that all plans would have the same bus acquisition programme but this would fall off in Systems B and C as the light rail system was completed.

1.019. Capital and operation costs for each system are shown in Table XIV.12.

Table XIV.12

Public transport capital and operating costs — actual and discounted (PRs. lakhs)

<table>
<thead>
<tr>
<th>System</th>
<th>Capital cost</th>
<th>Operating Cost b/</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Outlay</td>
<td>Discounted a/</td>
</tr>
<tr>
<td>System A</td>
<td>4 916</td>
<td>3 397</td>
</tr>
<tr>
<td>System B</td>
<td>11 204</td>
<td>6 798</td>
</tr>
<tr>
<td>System C</td>
<td>9 847</td>
<td>6 188</td>
</tr>
</tbody>
</table>

a/ Discount rate 12 per cent.
b/ Operating costs equal total costs minus taxes.

3. Economic analysis of alternative public transport modes

1.020. System A was regarded as the minimum action necessary for the growth of the City. It was used as the point of reference for the evaluation of Systems B and C.
1,021. The alternatives are evaluated primarily on the basis of operating cost savings through 1985. The systems yield a flow of benefits long past that date, but estimates are available only through 1985. Relative to the bus, the light rail and rail systems offer greater safety, a higher level of service in terms of speed, reliability and comfort and, possibly, greater acceptance by those who might otherwise use private cars. However, in a developing economy with surplus labour and very low incomes, safety, travel time and comfort benefits have little if any value. These other factors would be considered only if a system were marginal on the basis of the primary criterion of operating cost savings.

1,022. A discount rate of 12 per cent was used, as it has been used throughout the course of the planning work.

1,023. Tables XIV.13 and XIV.14 show the first year rate of return using 1985 as the first year of full operation and the discounted costs and benefits through 1985.

### Table XIV.13

Economic comparison of public transport system first year rate of return (PRs. lakhs)

<table>
<thead>
<tr>
<th>System</th>
<th>Capital cost</th>
<th>Capital cost difference</th>
<th>Operating cost</th>
<th>Operating cost difference</th>
<th>Rate of return</th>
</tr>
</thead>
<tbody>
<tr>
<td>System A</td>
<td>4,916</td>
<td>-</td>
<td>1,589</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>System B</td>
<td>11,204</td>
<td>6,288</td>
<td>1,335</td>
<td>254</td>
<td>.04</td>
</tr>
<tr>
<td>System C</td>
<td>9,447</td>
<td>4,731</td>
<td>1,352</td>
<td>237</td>
<td>.05</td>
</tr>
</tbody>
</table>

### Table XIV.14

Economic comparison of public transport system benefit/cost ratio (PRs. lakhs)

<table>
<thead>
<tr>
<th>System</th>
<th>Discounted capital cost</th>
<th>Discounted capital cost difference</th>
<th>Discounted operating cost</th>
<th>Discounted operating cost difference</th>
<th>Benefit/cost ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>System A</td>
<td>3,397</td>
<td>-</td>
<td>6,522</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>System B</td>
<td>6,796</td>
<td>3,401</td>
<td>5,961</td>
<td>530</td>
<td>0.16</td>
</tr>
<tr>
<td>System C</td>
<td>6,188</td>
<td>2,791</td>
<td>6,030</td>
<td>491</td>
<td>0.18</td>
</tr>
</tbody>
</table>

* Discount rate 12 per cent.

1,024. Systems B and C have a first year rate of return of 4 per cent and 5 per cent respectively. In the United Kingdom and most other developed countries viable projects are expected to have returns over 10 per cent in urban areas and over 15 per cent in rural areas. Neither plan is viable in these terms and the addition of other factors would not be sufficient to alter the conclusion (although it might in a developed economy where they typically account for 50-66 per cent of the benefits).
1.025. The benefit/cost ratio is only 0.16 and 0.18 for Systems B and C respectively. Systems B and C would generate benefits beyond 1985 but at the high discount rate used, this would not amount to much in present value terms. One concludes that in the present Karachi situation, emphasis should be placed on improving the existing bus and rail systems.

4. Long-term public transport considerations

1.026. There can be no doubt that the immediate emphasis in Karachi should be placed on the existing modes. Nevertheless, the forecast 1985 conditions suggest that the bus system would be under stress and for this reason the question of long-term alternatives needs to be considered.

1.027. One factor that could influence the timing of development of a light rail system is the cost and availability of fuel oil.

1.028. Table XIV.15 shows that the greater the emphasis on rail and light rail the lower the foreign exchange requirements for operating purposes. The more the price of fuel oil increases the greater the benefit of reducing the bus system loadings and increasing the loadings on the rail and light rail systems.

<table>
<thead>
<tr>
<th>System</th>
<th>Bus</th>
<th>Rail</th>
<th>Light rail</th>
<th>TOTAL 1985 Total operating costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>System A</td>
<td>2 330.0</td>
<td>266.0</td>
<td></td>
<td>2 596.3</td>
</tr>
<tr>
<td>System B</td>
<td>1 504.8</td>
<td>353.1</td>
<td>373.6</td>
<td>2 231.5</td>
</tr>
<tr>
<td>System C</td>
<td>1 525.0</td>
<td>310.1</td>
<td>417.6</td>
<td>2 252.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System</th>
<th>1985 Economic operating costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>System A</td>
<td>1 456.4</td>
</tr>
<tr>
<td>System B</td>
<td>940.5</td>
</tr>
<tr>
<td>System C</td>
<td>953.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>System</th>
<th>1985 Annual foreign exchange component</th>
</tr>
</thead>
<tbody>
<tr>
<td>System A</td>
<td>583.0</td>
</tr>
<tr>
<td>System B</td>
<td>376.0</td>
</tr>
<tr>
<td>System C</td>
<td>381.3</td>
</tr>
</tbody>
</table>

1.029. If road traffic is to be restrained it is important that the public transport system offer a reliable and good quality service. Even with good management bus systems have difficulties because of the joint use of the roadway with other vehicles. In Karachi today the only well managed transport systems are the PWR and the small tramway. It is likely that the nature and requirements of tram and railway
technologies will always lead to better management organizations. This is a second factor in favour of eventual conversion to a light rail system.

1,030. Many of the advantages of rapid transit can be achieved by the construction of a modern light rail system at a very much lower expenditure. There are existing wide reservations in many parts of the City that would be ideal. The light rail vehicle has lower operating costs and foreign exchange components than a bus and the operating costs are only marginally higher than rapid transit. The system is simpler to operate and maintain than rapid transit. If required in the future a light rail system could be put under the street in cut and cover tunnels. On the basis of our forecasts the light rail system could be started at an earlier date than any rapid transit system and shorter lengths of line would be required to obtain some initial benefits. The labour requirements of a light rail system would be higher than rapid transit but lower than buses.

1,031. Our analysis is probably not complete enough to definitely say that Karachi should never have a rapid transit system, but it appears most unlikely to be ever justified on normal economic criteria. The view in Karachi is that such a system should be an underground one if it is ever built. There are strong objections to large elevated structures but an underground system in Karachi would bring immense engineering problems and would be very expensive.

8. OBJECTIVES

1,032. The following objectives are recommended:

(a) To restrain the increase of private passenger cars sufficiently to reduce the need for capital investment in roads systems and to encourage the use of public transport.

(b) To substantially improve bus transport service through increasing the number of buses to meet demand and improving operations and maintenance.

(c) To encourage the efficient use of the tramways and circular railway for passenger movements.

(d) To permit the continued operations of autorickshaws, tongas, victorias, camel carts and donkey carts to provide low cost, short-haul services for low-income groups within high density areas, and to support continued employment opportunities with these transport modes.

(e) To construct minimum key additions to the road system and to improve traffic management techniques to increase the efficiency of the existing road network.

(f) To provide the administrative and regulatory framework necessary for securing the co-ordinated development and operation of the metropolitan transport system.
F. THE URBAN TRANSPORT PROGRAMME

I. The public transport programme

(a) Buses

1,033. The most urgent requirement is an immediate large increase in the number of buses in service and a programme of fleet expansion to keep pace with future increases in demand as they develop. Service levels should be improved to the point where buses are sufficiently attractive to compete actively with the minibus, taxi, autorickshaw and the privately owned vehicle. Only in this way can costly road improvements related to rapid increases in road traffic volumes be avoided. Karachi should make every effort to avoid a situation where continued high expenditure on road construction is needed to keep its people and goods moving.

1,034. It has been estimated that to achieve these objectives, 3,955 additional buses would be required by 1985. This increase, if the presently available fleet is properly maintained and operated, would allow current demands to be met and would permit a gradual reduction of average vehicle occupancy to a satisfactory comfort level.

(b) Fares

1,035. Fares for bus services should be increased. Current fares are so low that private operators are limiting their services and the public sector is operating at a financial deficit. In order to determine what fare levels would be reasonable for Karachi, a brief study was made of typical "first fares" in many cities. Karachi had the lowest fare of any city in the study, including Singapore, Bombay, Kabul, Bogota and Djakarta. In view of the levels of service in these cities, this is a strong indication that fare levels in Karachi may require a sizeable increase to provide proper levels of service and maintenance.

1,036. Based upon the study of other cities and an analysis of bus operations in Karachi an increase in bus fares in Karachi would appear to be reasonable. The present fares are PRs.10 paisa for three miles, substantially below the fully allocated cost per person mile of PRs.6.5 per passenger mile estimated by the project staff. The fares should be increased to PRs.15 paisa for trips up to two miles. Fares for longer trips should also be increased using the same basic rate. The increase is urgently needed to put the bus system once more on a firm financial footing. Financial support should be provided to bus companies with capable management, and operational and maintenance support should be supplied to all bus companies needing it.

(c) Terminals

1,037. Bus terminals should be constructed at Boulton Market and Lingqatabad Market. Truck terminals should be constructed at Mauripur Road, Hawkes Bay Road, Shershah, Borstal Jail, Kemari, the Steel Mill and Port Qasim. Taxi stands, minibus terminals and autorickshaw stands should also be constructed at a large number of locations.
Management and maintenance training

1.038. The bus fleet expansion programme would be of doubtful value unless management and maintenance standards were high enough to ensure efficient bus utilization. High priority should be given to a training scheme for managers and other administrative staff in both public and private sectors of the bus industry. A similar scheme is urgently needed to train diesel mechanics (presently in short supply) and other skilled staff and management in efficient maintenance practice.

Rail facilities

1.039. No major new light rail facilities are recommended at this time, but the right-of-way of the existing diesel-powered tram should be upgraded, and the trams should be rebuilt with new engines.

1.040. Light rail rights-of-way should be established and safeguarded since the opportunity cost of doing this now is very low. Once the necessary improvements to the existing rail and bus systems have been made, resources should be allocated to a more detailed evaluation of the cost and benefits of a modern light rail system for Karachi.

1.041. The capacity of existing rail facilities should be increased sufficiently to serve increased demand through 1985. Improvements on the KCR would enable 60-minute service or better to be provided in all parts of the system. Approximately 320 vehicles would be required by 1985, and right-of-way improvements should be made as well.

2. Other components of the transport programme

The road projects required

1.042. The programme proposals for the road system are based upon forecasts of road traffic demand described earlier. Under the restrained situation the passenger car unit (p.c.u.) miles travelled in the urban area in 1985 will be about 70 per cent higher than those of 1971. Approximately, 74 per cent of this is produced by the movement of private vehicles. In the unrestrained case, the increase in p.c.u. miles travelled would be 124 per cent, 81 per cent of which would be produced by private travel.

1.043. Because Karachi's road system provides a capacity far greater than that needed today, few improvements would be needed to make it capable of absorbing the demand under the restrained conditions. This is partly because the Land use plan limits the expansion of central area employment. Hence travel increases are largely distributed over other parts of the road system where reserve capacity is already available. The improved public transport system, providing direct services for trips between the central area and most population concentrations, also plays an important part in minimizing traffic volumes in the inner sections of the road system.
The following road system improvements are needed by 1985.

(i) Southern Bypass Road

1,045. The section of the Southern Bypass between Clifton Road and New Queens Road will attract high traffic volumes (35,000 p.c.u. per day) by 1985. Most of this travel is to the Moceod Road and Boulton Market area employment centres, and would cause overloads on Kutchery Road, New Queens Road and Moceod Road in the absence of this new facility. A four lane divided road with well designed intersections would be required.

(ii) New road crossing Thole Produce Yard and improvements to South Napier Road

1,046. This link carries 28,000 p.c.u. per day and acts as an important component of the Southern Bypass route. A four lane road with parking prohibitions but no restrictions on access is needed.

1,047. There are railway lines close to McLeod Road in the area, so the route might prove difficult to construct, but since it will reduce traffic volumes over a considerable mileage of central area roads, its feasibility should be studied.

(iii) Roads in Jacob Lines area

1,048. The extension of Assani Shaheed Road from Gora Qabristan to meet Freedy Street extension will provide a route for some of the traffic from Korangi and Drigh Road to the Saddar area. This will relieve the inner section of Drigh Road, where it is reduced to six lanes, as well as the Palace Cinema junction. The link will carry 32,000 p.c.u. per day in 1985, which could be carried by only two lanes if the roads in this area are built to fairly high standards.

1,049. The extension of Kashmir Road to join the extension of Freedy Street performs a similar function, bypassing traffic from the Guru Mandir, and M.A. Jinnah Road area and permitting it to enter the central area at a new little used access point. It will attract 26,000 p.c.u. and needs only two lanes of high standard road. Both this link and the Abbasi Shaheed Road extension should be built with rights-of-way to allow at least four-lane construction when volumes increase above the 1985 forecasts.

1,050. Kashmir Road is assigned a 1985 volume of 25,000 p.c.u. per day and will require four lanes if adjoining properties continue to have direct access to it. Freedy Street and its extension will carry 53,000 p.c.u. per day in 1985, considerably higher than the present capacity, but its capacity could be sufficiently increased by parking controls and better traffic management without widening. The new extension should be six lanes wide in 1985.

1,051. The 1985 forecasts show high volumes on the roads between the Metropole Hotel area and Guru Mandir, through Saddar. While considerable capacity could be developed on the available roads (Victoria, Elphinston, Somerset and Frere Street), these pass through the most active shopping
areas of the City. It is likely that if a direct route were developed running approximately northwards from Brigh Road to the Mazar area some of this traffic might be bypassed away from the Saddar area.

Other central area roads

1.053. The sections of M.A. Jinnah Road and Lawrence Road west of Saddar area are expected to carry volumes very close to their capacities by 1985, with possible overloads taking place on M.A. Jinnah Road between Victoria Road and Mansfield Street. This situation could be eased and post-1985 increases accommodated if Lawrence Road were improved by parking controls and traffic control measures. This would allow an alternative route for some of the M.A. Jinnah Road traffic.

1.054. New Queens Road between Rutchebery Road and the Southern By-pass is assigned 40,000 p.c.u. per day and will need four lanes with well-designed intersections. The railway bridge would also have to be widened to carry a 48-foot wide pavement.

(v) Other road improvements

1.055. By 1985 Clifton Road is expected to carry 44,000 p.c.u. per day (less than 60 per cent of its present capacity), and the bridge across the railway will carry 59,000 p.c.u. per day. The bridge, to carry this volume, should be widened to 48 feet.

1.056. Mauripur Road will carry 25,000 p.c.u. per day between its southern end and the Lyari River and will need to be rebuilt to a higher standard with four lanes.

1.057. The Hab Chauki Road, giving access in 1988 to the high population areas of Baldia, will carry 30,000 p.c.u. per day and this should be provided by a high-standard two-lane road or four lanes if the road is also to provide access to adjacent properties.

1.058. Manghopir Road serving the Aurangzi area, will carry 42,000 p.c.u. per day and a limited access four-lane road should be provided. North of Aurangzi to Manghopir, pavement width should be increased to 24 feet.

1.059. Volumes assigned to Shahrah-e-Pakistan (the Super-highway) between Tin Watti and North Nazimabad (52,000 to 85,000 p.c.u. per day) are higher than the presently available capacity on this route (41,000 to 58,000 p.c.u. per day). The pavement width is already available to carry such volumes, but considerable improvements would be necessary, including limitations on access.
1.060. The widening of Drigh Road now in progress, will provide considerable surplus capacity, even under 1985 conditions, to the entire section between Nursery and the civil airport. East of the airport as far as the road to the Machine Tool Factory, volumes of 41,000 to 59,000 p.c.u. per day are expected. This would call for a six-lane all-purpose road, or a four-lane road with little frontage access and high capacity junctions.

1.061. The extension of Shaheed-e-Millat Road to Korangi is assigned 20,000 p.c.u. per day in 1985 and this would call for a two-lane road. The combined volume on Korangi Road and the Shaheed-e-Millat extension amounts to 59,000 p.c.u. per day. If the extension of Shaheed-e-Millat Road were not built, this combined volume would be within the capacity of Korangi Road alone, when it is developed to a six-lane high standard as proposed.

1.062. The extension of Rashid Minhas Road from Drigh Colony to Korangi is assigned 17,000 p.c.u. per day and a two-lane roadway will be adequate for this volume.

1.063. The proposals to build one new crossing of the circular railway in Nazimabad and to improve the capacity of another do not seem to be warranted by the 1985 forecasts. These links are assigned volumes of only 5,000 and 8,000 p.c.u. per day respectively, and other roads across the railway in this area will have surplus capacity in 1985.

1.064. The proposed new Lyari Bridge near Karachi Central station attracts only 5,000 p.c.u. per day, largely because it lacks direct connections to the major road system and cannot serve through movements. The 1985 volumes in this area are generally low, probably because of greatly improved employment/population balances in the surrounding districts.

1.065. The proposed improvements in the Lyari crossings west of Manghopir Road and their connecting roads were intended to achieve better traffic distribution. Although the volumes they handle in 1985 are not high, they have been effective in doing this, so reducing high concentrations on more major routes. The most important component of this system are the new link between Chakiva Road, Estate Avenue, and Mirza Adam Khan Road. Well designed and separated two-lane roads would be sufficient to carry the 1985 volumes.

(b) Supplementary transport projects

1.066. In addition to the public transport and roads described above there are a number of small but important related programmes which should be implemented to improve management and maintenance, driving habits, traffic management and transport data collection.

(f) Traffic signs

1.067. A city of Karachi's size should be making full use of the entire range of signs and other devices which assist in directing and controlling traffic. These can be locally made and installed in large numbers at low cost. However, very few devices of any kind have been installed, and of these
most are non-standard causing few road users to understand them. Here too, careful design, uniform practice and ade-
quate education are essential.

1.068. An urgent first step should be a review of the exist-
ing road markings in the City which are often used incorrectly
and lead to a general disregard of markings by drivers.
Misleading, unnecessary or incorrect markings should be re-
placed with correct ones and these should then be enforced.

1.069. Better traffic control at most problem intersections,
can be achieved at very low cost simply by the use of STOP
signs and/or road markings. It is, of course, essential
that road users be made aware of the meaning of such devices.

11) Driver education

1.070. An active campaign of driver education is necessary.
Road safety messages and even films are now beginning to
appear on television and in cinemas. These should be en-
couraged if they continue to be privately sponsored, but it
would be preferable for a public agency to assume this respon-
sibility and to extend the messages to a wider audience. The
results of considerable research on effective education methods
in this field are now available.

111) Continuing urban transport planning

1.071. The urban transport programme should be supported by
the establishment and maintenance of systematic traffic
records for traffic volumes, speeds and accidents. These
would enable warrants to be established for engineering and
enforcement programmes and would assist in evaluating their
effectiveness.

1.072. Urban transport planning should be regarded as an
on-going function. It is necessary to provide information
on transport and to improve transport policy and transport
programming and project analysis.

1. Costs of the urban transport programme

1.073. The costs of the proposed transport programme are
listed in Table XIV.17. Major items include buses (Rs.41.5
crores) and road and bridge projects (Rs.18.4 crores).
The level of expenditure for roads is relatively low due to
the general adequacy of the existing roads system, and most
available financing should be applied to the public transport
system.
Table XIV.17

<table>
<thead>
<tr>
<th>Item</th>
<th>Capital cost (PKR. Lakhs)</th>
<th>Foreign exchange cost (PKR. Lakhs)</th>
<th>Maintenance cost per annum (PKR. Lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public transport programme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ducts</td>
<td>4,147</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Transit renewal</td>
<td>65</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Rail vehicles</td>
<td>308</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Rail R.O.W. improvement</td>
<td>450</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Subtotal</td>
<td>4,996</td>
<td></td>
<td></td>
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<tr>
<td>Naval transport programme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44 Road and bridge projects</td>
<td>1,830</td>
<td>1,184</td>
<td>28</td>
</tr>
<tr>
<td>16 Intersection improvements</td>
<td>10</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Sidewalk improvement programme</td>
<td>5</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Subtotal</td>
<td>1,861</td>
<td>1,181</td>
<td>28</td>
</tr>
<tr>
<td>Supplementary public transport and roads transport programme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Bus terminals</td>
<td>7</td>
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<td>N.A.</td>
</tr>
<tr>
<td>7 Truck terminals</td>
<td>9</td>
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<td>N.A.</td>
</tr>
<tr>
<td>Taxi stands</td>
<td>2</td>
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<td>N.A.</td>
</tr>
<tr>
<td>Minibus terminal</td>
<td>2</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Autorickshaw stands</td>
<td>1</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Public transport priority route</td>
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<td>N.A.</td>
</tr>
<tr>
<td>Bus management</td>
<td>96</td>
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<td>N.A.</td>
</tr>
<tr>
<td>Bus maintenance</td>
<td>13</td>
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<td>N.A.</td>
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<tr>
<td>Commercial drivers training school</td>
<td>25</td>
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<td>N.A.</td>
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<tr>
<td>Traffic enforcement training school</td>
<td>5</td>
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<td>N.A.</td>
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<tr>
<td>Traffic enforcement scheme</td>
<td>35</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Urban transport data collection and planning</td>
<td>4</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>Subtotal</td>
<td>157</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>7,916</td>
<td>(1,161)</td>
<td>(28)</td>
</tr>
</tbody>
</table>

4. A public transport finance and agency programme

1,074. The most important component of the recommended public transport programme for Karachi is the expansion of the bus fleet to overcome current deficiencies and to provide services that are sufficiently attractive to prevent a large-scale transition to private transport. This should be accomplished primarily by expansion of the private sector. Rather than provide bus services directly, the Government should establish programmes for financial and technical support for private bus operators.

1,075. To provide financial support there could be formed a state corporation to provide credit for private transport owners of "common carrier" services for purchase of new equipment and major repair of older equipment. Financing should be provided for new City buses, the purchase of new bodies and acquisition of diesel motors to replace the more expensive and polluting petrol motors. Loans should be provided to goods transporters for purchase of lorries and
trailers, as well as for the construction of shops, warehouses, and terminals. Taxis should also be financed by the agency.

1,076. In addition to purely financial activity, the agency could undertake a number of support programmes to increase the effectiveness of the loan. It could aid potential clients in selection of equipment, provide instruction in simplified bookkeeping, do a general assessment of projects to be undertaken, process the paperwork needed for importation of equipment, provide a technical engineering staff for the construction of bus and truck terminals, and aid in the establishment of new owner co-operatives.

1,077. The agency could assist the Government in the standardization of vehicle types, and participate with police and insurance representatives in the inspection of equipment at various locations to ensure safe operation. It could also provide a forum for the Government to monitor the opinions and problems of the transport operators.

1,078. In effect, the agency would act as a successful method of finance to gain participation of available private capital for a very important public service. The owners obtain title to the vehicle at the end of the loan agreement, and the Government is able to regulate the bus system through the combined efforts of the financing agency and the police. Yet the Government would not be required to assume operation of the system. This results in better services, more efficient operation, better mobilization of private resources and lower costs to the Government and the public.

1,079. A preliminary cash flow analysis has been made for such a programme in Karachi. The bus would be considered collateral for the loan. The owner would be required to provide a 20 per cent downpayment with the remainder financed by the agency. The repayment period would be four years in order to ensure that the recovery value of the vehicle would be greater than the equity and to allow the owner to accumulate funds for maintenance as the vehicle becomes older. Repayment would be made in equal monthly installments. The charges include a 14 per cent charge per annum for administration and interest. The financing institution would arrange payment for the importation of the chassis and motor and/or purchase of equipment from local manufacturers. It could contract with local bus body builders for manufacture of bus bodies. Upon delivery to the private owner, or application for financing, the owners would make a 20 per cent downpayment. In addition to bus programmes the agency could provide financing for taxis, minibuses, autorickshaws and goods vehicles. It could also encourage the establishment of improved mechanic shops.

1,080. Table XIV.16, Bus finance programme 1974/1975-1984/1985, indicates the cash flow that would be experienced in such a bus finance programme.
### Table XIV.16

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Buses</th>
<th>Cost (lakhs, 1972 prices)</th>
<th>Downpayments</th>
<th>Repayments</th>
<th>Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>545</td>
<td>678</td>
<td>68</td>
<td>371</td>
<td>-610</td>
</tr>
<tr>
<td>1975</td>
<td>545</td>
<td>678</td>
<td>136</td>
<td>618</td>
<td>-705</td>
</tr>
<tr>
<td>1976</td>
<td>545</td>
<td>678</td>
<td>136</td>
<td>865</td>
<td>-382</td>
</tr>
<tr>
<td>1977</td>
<td>545</td>
<td>678</td>
<td>136</td>
<td>1,025</td>
<td>527</td>
</tr>
<tr>
<td>1978</td>
<td>165</td>
<td>205</td>
<td>89</td>
<td>730</td>
<td>1,093</td>
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<tr>
<td>1979</td>
<td>165</td>
<td>205</td>
<td>41</td>
<td>558</td>
<td>486</td>
</tr>
<tr>
<td>1980</td>
<td>165</td>
<td>205</td>
<td>41</td>
<td>386</td>
<td>708</td>
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<tr>
<td>1981</td>
<td>165</td>
<td>205</td>
<td>41</td>
<td>300</td>
<td>843</td>
</tr>
<tr>
<td>1982</td>
<td>165</td>
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<td>41</td>
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1,081. The peak debit position would be Rs. 781 lakhs in the second year of operation. This would be progressively reduced until a positive equity would be obtained during the year 1977/1978. It would appear that seed capital of approximately Rs. 10 crores would be required to establish such a programme for Karachi. These figures should, however, be considered very tentative. A thorough financial analysis is needed in the next stage of transport planning.

1,082. Such a programme need not be limited to Karachi. It might be started in Karachi, and transferred to other urban and rural areas as experience is acquired and a surplus of funds is generated from the initial seed capital.

#### E. IMMEDIATE ACTION

1,083. Implementation of the transport programme is a long-term task, but there is need for an urgent response to the most pressing issues:

1. Implementation of the Five-Year Programme

1,084. Active implementation should be commenced immediately on the suggestions of the Recommended Transport Improvement Programme for the Five-Year Period 1972-1977, prepared by the Karachi Planning Project in January, 1973. This programme identified the most urgent projects required in the Metropolitan Area related to the overall objectives of the Development Plan. These included projects or programmes for:

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(a) Purchase of 1,900 new buses over the five-year period 1972 to 1977. This increase, if the presently available fleet is properly maintained and operated, would allow current demands to be met and permit a gradual reduction of average vehicle occupancy to a satisfactory comfort level by 1977.

(b) A proposed bus leasing scheme, a bus management improvement scheme, a bus maintenance improvement scheme, professional drivers training scheme, new bus terminals opposite the Boulton Market and in Liaquatabad (for long distance bus service), and bus fare increases.

(c) Modernization of the tramway system and improvements to the Circular Railway.

(d) Minor road improvement schemes, 10 priority intersection improvement schemes, and 10 minor intersection control improvements, use of exclusive bus lanes, pedestrian protection and improvements of the footways.

(e) Traffic enforcement improvement programme, traffic engineering programme, urban transport data compilation and continuing planning.

2. Increase in bus fares

1,085. It has been determined that the operating costs of bus service average at present 4.1 paisa per passenger mile. Assuming that 156,000 passenger miles per month could be generated per bus, this indicates that 6.5 paisa per passenger mile is a reasonable, fully-allocated cost level per passenger mile. The economic analysis indicates that a minimum charge of 15 paisa for trips up to two miles and a graduated fare for longer distance would be appropriate.

1,086. It is recommended that fares be increased to encourage the continued participation of the private sector in the transport system and to reduce the deficit of the public sector operations.

3. Private vehicle restraints

1,087. A clear public commitment to supporting private vehicle restraints is urgently needed. This should take the form of maintaining or increasing the import restrictions on cars and increasing related fees and licenses. Limitations on parking in congested areas should be imposed and parking charges introduced.

1,088. Most importantly, further consideration of establishing the industrial capacity to produce private cars in Pakistan should be stopped. Planning should be shifted to preparing for the production of buses and trucks.

4. A Metropolitan transportation authority

1,089. Better transportation administration is required urgently. The first step would be the creation of a Karachi Metropolitan Transportation Co-ordination Agency. It would
be established by order of the Governor of Sind, and through consent of the Federal Government for participation by any Federal agencies involved (e.g., the Pakistan Western Railway). The term "agency" is used to indicate that a large council of representatives of the several units of government concerned with transportation and traffic in the Region is not proposed. A council would be too unwieldy a body to accomplish the objectives. The agency would consist of professionals. An advisory council should be constituted as an adjunct to it, as a method for bringing together representatives of the various governmental units to be co-ordinated, and perhaps providing some policy directions.

1,090. The agency might be attached to an existing provincial department. The agency's secretariat and possibly some of the technical staff might be provided by the Master Plan Department.

1,091. Its functions might include the following:

(a) It would conduct or sponsor studies to investigate the need for and feasibility of a semi-autonomous Metropolitan Transportation Authority. The critical inquiry would be: what functions could be performed better, or more economically or efficiently, by a single semi-autonomous authority with jurisdiction over the entire Region? At this point it cannot be said that an authority should take over public bus transport and a new rail transit system, or combine those functions with some highway development functions, or perform yet other functions in the Karachi setting. The proposed co-ordinating agency for Karachi, after some experience and studies, should be able to come up with the right answers for the Region.

(b) The agency should examine and pass on all proposed major schemes for public investment in transport facilities, both public and publicly supported private facilities. The function might also include the review of applications for bus franchises. The addition of a bureaucratic hurdle in the licensing system is not suggested, but rather a mechanism by which the agency might be apprised of important decisions affecting regional transportation. Appropriate relationships would have to be worked out for each type of review, to avoid complicating administrative processes and make it clear that the agency is not supplanting existing licensing and development officers.

(c) A similar review function might be performed in connexion with proposed highway widening, extension of new construction schemes (of KDA, the KMC, etc.). The agency review would focus on such aspects as:

(i) design and specification, as they affect related parts of the system, particularly with a view towards developing uniform standards (the layouts of intersections in Karachi are not uniform, and some are poorly designed);

(ii) conformity with existing or proposed plans for the Region;

(iii) implications for (and of) other related urban functions, such as the development of new communities, industrial centres, sewage systems, water supply systems, and facilities that generate considerable traffic (in collaboration with the agency responsible for overall planning for the Region).
(d) The agency might identify deficiencies in the maintenance of highways and transportation facilities, and coordinate with the units responsible.

(e) The agency might provide a forum for arbitrating or mediating disputes between different agencies with conflicting operations or programmes (such as a dispute as to whether the Railway or KMC should maintain a particular overpass; or situations in which Cantonment Boards might lay streets which may be incompatible with the surrounding road network under the jurisdiction of the KMC or some other body).

(f) Going beyond but related to its review functions, the agency might be made responsible for preparing performance standards for road design and construction, and similar types of transportation planning and development.

(g) The agency might develop a central repository of traffic transportation data to be made available to all concerned governmental and semi-public organizations in the Region.

1,092. After a year or two of operation, a full Metropolitan Transportation Authority might be recommended by the coordinating agency.
CHAPTER XV

COMMUNICATIONS

A. TRENDS AND ISSUES

1.093. Karachi is the communications hub for the whole of Pakistan. Its communication devices range from the modernity and sophistication of television, radio, telegraph, telephone and cinema to the printed page and word of mouth.

1.094. The traditional modes of communication in Karachi are well developed. Tightly knit business groups with highly centralized control and traditional communal links mean that particular types of information are transmitted very rapidly through the many "grapevines" of informal communication that are vital to the City's functioning. Its modern systems - specifically the telephone, radio and television - still are in the process of maturing, and highlighting present communications problems attention will be focused on them.

1. Telephone

1.095. The provision of telephone services for the Metropolitan Area is the responsibility of the Pakistan Telegraph and Telephone Department. The development of the telephone system throughout Pakistan is being undertaken with technical assistance provided by the Government of Sweden. It is estimated that in 1976 there will be approximately 124,000 telephone line units installed to serve the needs of a metropolitan area of approximately 4.2 million (approximately 36 units per thousand population). The two basic problems with the existing telephone system are availability and operability.

1.096. The constraint on overall availability is not so much a problem of the supply of telephone units, since Pakistan now has the capacity to produce 40,000 units per year, as it is the unavailability of cable for connections (which must be imported) and the shortage of function-cable pairs or trunk pairs between telephone exchanges.
1,097. The lower-income groups and small businesses suffer the greatest deficits. The possibility of a low-income household having an individual connexion is limited by installation and service cost levels relative to income. Installation costs PKr. 350 plus two months' line rent in advance; the line charge for a house connexion is PKr. 25 per month plus 20 paisas per call. It is therefore very difficult for a household with an income below PKr. 1,000 per month to afford a telephone. The public telephones that are available to low-income groups often are not well maintained. Some areas, such as Korangi, are without a reliable service even for emergency purposes.

1,098. The operability of the entire metropolitan telephone system is limited by overloads relative to existing capacity, resulting in poor connections and cross-conversations, and maintenance difficulties which result in frequent breakdowns.

2. Radio

1,099. Domestic broadcasting services are the responsibility of Radio Pakistan. Radio has a major role to play in basic education and a supporting role in urban development through the broadcasting of information on job opportunities and the availability of public services and through publicity for metropolitan development programmes.

1,100. Radio at present is underutilized for educational and development support purposes. A minimal battery-operated pocket-size transistor set probably is within the reach of most households with incomes of PKr. 300 per month or more; some households below this income level manage to afford such sets.

3. Television

1,101. Domestic television services are the responsibility of the Pakistan Television Corporation. Transmission of foreign programmes via satellite is just becoming possible. The potential for the educational and developmental support role of television is obviously very great.

1,102. The basic problem associated with television at present is the high cost of receivers relative to household incomes. Very few households with monthly incomes of less than PKr. 1,000 are able to afford sets. This limits availability to about 6 per cent of the Metropolitan Area's households. The solution must lie in some form of public receiver installation.

1,103. Underutilization of the potential of television for educational and developmental support purposes is a problem that is now receiving governmental attention. The Pakistan Television Corporation has been charged with the responsibility of extending television more widely throughout the country.

4. OBJECTIVES

1,104. Two major objectives underlie the overall communications programme that should be launched now in the Metropolitan Area.
(g) To achieve the flows of information necessary to enable the metropolitan population to participate fully in the distributional benefits of the improvements and growth resulting from the Development Plan. The focus initially should be on the low-income households that are the principal targets of other sector programmes.

(h) To provide business enterprises, governmental organizations, households and other productive entities with the communications base necessary to achieve the aggregate output levels sought in the Plan.

C. THE PROGRAMME FOR 1974-1983

1. Support for the Development Plan

1.105. If the development of communications in the Metropolitan Area is to be focussed efficiently on the equity and productivity objectives of the Development Plan, the programme for communications must be designed explicitly to support the Plan's individual sector programmes.

1.106. The various media should be mobilized to publicize the Development Plan and its component sector programmes. Specific media programmes should be developed to inform the public about the plans and the opportunities for public participation in them.

1.107. It is particularly important that the media be used to prepare the public for significant changes in such things as taxation, user charges for utilities and services, or fare increases in public transit. These increases must come if the Metropolitan Area is to deal with its central problems, but the public has a right to be informed about why the increases are necessary and how services are to be improved with the increased revenue. This is essential if the kind of public outcry which accompanied the sudden announcement of increased bus fares in 1973, and which forced a retraction, are to be avoided in the future.

1.108. The variety of communications needs calls for a thorough mobilisation of all the available media and methods -- public meetings, printed publications, graphic displays in public places, radio and television programmes, public documentaries in cinemas, major improvements in the Metropolitan Area's telephone and telecommunications systems, and the establishment of offices for the circulation of essential public information. No matter how sound the ideas of the Development Plan and the metropolitan planning process may be, they cannot be implemented, sustained or improved upon effectively if they are not communicated properly.

2. Communications and the spatial organisation of activities and facilities

1.109. The spatial organization of activities and facilities has a major impact on the likelihood of effective communication being achieved and on the costs of communication — not only in the obvious sense that it affects the costs of the
networks and facilities required, but also through the more subtle influences of proximity and spatial configuration.

1,116. This suggests that the Metropolitan Area's economic and social activities should be spatially related to one another -- at the metropolitan scale and the local scale of households and enterprises -- to make possible the interaction communications they need.

1,117. Many kinds of communication can take place more in an area occupied by a single communal grouping which has a very effective internal "grapevine" for transmitting information, than in an area whose social structure is highly diversified.

1,118. The importance of spatial organization points up the importance role communications centres have to play in development. Potential information centre buildings and facilities should be placed where their audiences can be reached most easily and fullest possible advantage should be taken of locations with high communication potential -- markets and bazaars, mosques (which could play an increased role in education and other social services as well as religion), schools, health centres, community development centres, parks (an excellent location for public television sets), railway stations, bus stops and major road intersections.

1,119. Detailed physical planning linked with the overall spatial structure proposed for the Metropolitan Area in Chapter VI should reflect these principles.

3. The development of individual media

1,120. A comprehensive programme for the development of communications has not yet been developed. Attention here will be focused on the telephone system, with brief comments on the types of development that may be desirable for radio and television.

(a) Telephone

1,121. The two key concerns for telephone communications in the immediate future are the support of essential economic, administrative, policy-making activity and the linking of low-income groups with essential urban services.

1,122. The first concern should be dealt with by concentrating the extension of services on the private and public sector institutions and enterprises that contribute to achieving development objectives, together with some extensions to business-related households where there is a genuine need to conduct governmental or private business outside office hours.

1,123. Since low-income households cannot afford to rent an individual dial unit, the second concern should be to make public telephones available in lower-income areas.

1,124. The maintenance of all services should be improved considerably. Import of the cables and other equipment necessary to take advantage of the capacity to produce instruments locally and to mobilize presently underutilized
exchange capacity should be given high priority. The impact of improved telephone communications on productivity is likely to be considerable.

1.119. A schedule for the installation of telephone line units in the Metropolitan Area up to 1985, using the population projections prepared in the Karachi Project, has been prepared by the Pakistan Telegraph and Telephone Department. A preliminary schedule suggested that a total of 230,000 units could be installed by 1985, beginning from an estimated 156,000 in 1974. After subsequent review of past installation rates and Karachi's share in annual installations, a revised target of 272,000 units installed (or financed, with about 222,000 actually installed) has been established tentatively. This level of installation, which would be for all commercial, governmental, domestic and other purposes, would represent a standard of approximately 24 units per thousand population. It would represent an average annual growth rate in installations of approximately 6.2 per cent, compared with an average annual population growth rate of approximately 4.7 per cent.

1.120. Using the revised target for telephone line units for 1985, together with the original Pakistan Telegraph and Telephone Department line unit costs and estimates for long-distance and wireless installation costs, the schedule and costs for telephone, long-distance and wireless installations up to 1985 would be as shown in Table XV.1.

### Table XV.1

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Source: Karachi Planning Project estimates, based on information provided by the Pakistan Telegraph and Telephone Department.
1.121. The average annual capital costs for 1975-1980 would be approximately Rs.8.5 crores. Revenues on telegraph and telephone operations in Karachi for 1972-1973 were approximately Rs.11.3 crores. The development proposed for 1974-1985 would be financed from Federal Government resources, with the foreign exchange component met from foreign assistance programmes, loans and suppliers’ credits.

(b) Radio

1.122. No full programme for the development of radio services and the supply of radios in Karachi specifically has been prepared as yet. The Government of Sind has a programme for the distribution of free radio sets in underdeveloped areas, but this is likely to be concerned primarily with improving conditions in rural areas.

1.123. In the Karachi Metropolitan Area the main concern initially should be to focus the development of radio services on the educational and informational programmes needed to support the sector programmes of the Development Plan, and to increase the availability of radio receivers to households with monthly incomes of Rs.500 or less. The aim should be to make simple receivers as widely available as possible on a commercial basis. One possibility might be to distribute simple receiving sets to low-income people as a payment-in-kind for participation in public works programmes, the Metroville programme and other contributions to the implementation of the Development Plan, or the population planning programme.

(c) Television

1.124. The strategy in television should be similar to that for the development of radio services, but the strategy for increasing the availability of receivers must, in the case of television, be focused on making public sets available in strategic locations. A programme and budget for this, with a capital cost of Rs.27.3 lakhs for 1974-1985 including the maintenance of the 500 sets to be installed, is presented in Chapter XX, which deals with the use of television as part of the overall education programme.

D. IMMEDIATE ACTION

1.125. The development of the type of communications programme outlined here will require the co-ordinated participation of a wide variety of agencies, including the executing agencies responsible for the individual sectors as well as the media agencies. The action needed immediately includes the following recommendations,

1. Preparation of a full communications strategy

1.126. A full communications strategy for the Metropolitan Area and, with lesser urgency, the rest of the Region, should be proposed under the leadership of the appropriate Federal agency.
2. Preparation of individual communications programmes

1.127. The preparation of individual communications programmes to accompany each of the sector programmes incorporated in the Development Plan and a programme to support the dissemination of information on the ongoing metropolitan planning process should be given high priority.

1.128. These programmes should include proposals for the necessary staff training, technical assistance, if any, and financing. The implementation of the communications programme would be an opportunity to provide productive employment for the educated unemployed in the Metropolitan Area in addition to the other employment it would generate.

3. Mobilization of productive capacity

1.129. Productive capacity in the communications sector should be mobilized. This should include increases in the domestic production of telephone equipment, radios, television sets, printed informational material, informational cinema programmes and graphic displays.

4. Establishment of a communications programme evaluation function

1.130. A communications programme evaluation function should be established to monitor the development of the sector and to provide inputs for subsequent improvements in overall strategy and individual programmes.
CHAPTER XVI

TOURISM AND RECREATION

XIV.1. TOURISM

A. TRENDS AND ISSUES

1. The location of Karachi and the market for tourism

1.131. Karachi, which is approximately eight hours from Europe, is located on major air routes between Europe, the Near East and the Far East. It is a jumping-off place for trips to Afghanistan, the Northwest Frontier, the Himalayas and the Indus Valley.

1.132. There are basically two markets for tourism in Karachi, the foreign market, which will be fairly limited in the foreseeable future, and the domestic market. The foreign market consists primarily of businessmen and their families and other groups perhaps having primary destinations elsewhere, but alert to the opportunities afforded by sites of historical interest, the beaches, the sea and inland lakes and the bazaar. The domestic market consists of businessmen visiting in Karachi plus families and other groups that have come to Karachi to experience the intricacies of Pakistan’s largest and most widely developed city. The domestic market is small at present, but it should grow rapidly as the nation develops. Domestic tourists are likely to have different tastes and preferences than foreign tourists, and it is important that this be recognized in planning for tourism in the region.

2. Facilities and their use

1.133. There are a number of sites of considerable historic interest in the vicinity of Karachi: at Thatta, the Makli Hills, Samud, Chakundi, Ranthore and Jam Tamachi-ji-Mari,
1,134. Thatta was of importance perhaps as early as the thirteenth and fourteenth centuries. Alexander rested his troops there after their march from the north. Long before him the rulers of Sind had their capital there. Some of the tombs and mosques remain, notably the Shah Johan mosque, but most of the glories of the past have disappeared.

1,135. Near Thatta is the Makli Hill with six square miles of tombs, falling roughly into three major historical periods: the Sindhi dynasty of the Summas; the period of the Turkhans and Arjhum rulers; and the period of the Moghul governors who ruled over the area after the consolidation of the Moghul empire. The stone carvings in these tombs are of extremely fine quality.

1,136. Samui, the capital of the Summa dynasty, lies three miles northwest of Thatta in the hills. Kalankot, three miles south of Makli, was a fort to which the Jan ruler retreated when the Moghuls conquered the area.

1,137. Approximately 17 miles from Karachi, on the road from Karachi to Thatta, are the Chakundi tombs, with tapered tombstones similar to the tomb of Cyrus in the Iranian Valley of Murghan.

1,138. At Banbore, nearly midway between Karachi and Thatta are the recently excavated ruins of the ancient city which is believed by some to have been the site of Debal, where Mohammed Bin Qasim, the Muslim Commander, is said to have landed in the eighth century A.D.

1,139. At Jam Tamachi-ji-Mari, near Kalri Lake, are ruins associated with the Summa dynasty.

1,140. North of Karachi toward the Hub Dam, is Manghopir, a shrine with several springs inhabited by crocodiles linked traditionally with the mystic attributes of the shrine.

1,141. In addition to the historic sites described above, the region has very fine beaches at Clifton, Hawkes Bay/Sandspit, Gadani and Sonmiani. There are two attractive lakes in the region; at Haleji and Kalri; a third lake will be created when the Hub Dam project is completed. Other smaller lakes will be created if the regional water resources proposals presented in this report are implemented.

1,142. To the southeast of Karachi is the Pipri Estuary, an area of low islands, marshes and tidal streams containing wildlife and several historic settlements.

1,143. Within Karachi there are a number of major tourist and recreation facilities. These include the Quaid-e-Azam-Mazar, the mausoleum of the founder of Pakistan, the Clifton promenade, the Karachi Zoo, with a collection worthy of any major city and containing several unique specimens, the Race Course, Hill Park and the Central Stadium.

1,144. Shopping in the downtown area is very good and traditionally varied. Mirrorwork embroidery, onyx, silver and gold jewelry, brasswork and carpets are particularly sought-after items.
B. OBJECTIVES

1.45. The major objectives in tourism are the following:

(a) To preserve and enhance the Region's historical sites, monuments and high-amenity sites so that their future potential as tourist attractions can be realized. (The private sector should be encouraged to undertake improvements in the quality of tourist-related services.)

(b) To utilize fully the recreational and educational potential of the Region's tourist areas, facilities and services.

(c) To generate employment. (Tourism is a relatively labour-intensive sector.)

(d) To develop as fully as possible the foreign-exchange potential of foreign tourism.

(e) To expand the domestic tourist market through better access to regional facilities and low cost accommodation at convenient sites.

1.46. Karachi's role as gateway to Pakistan for international tourism should be improved as a part of overall national tourism plans. However, the competitive disadvantage of the City and Region both to other areas in Pakistan and internationally should be kept in mind and premature capital investment in tourist facilities avoided.

C. THE PROGRAMME PROPOSED

1.47. No overall programme for tourism is proposed at this time. Tourism should have a low priority relative to other needs of the City and Region for public investment. The private sector should be given encouragement to expand their activities in the tourism field as demand warrants. The current level of public sector support should continue.

1.48. The Government has already recognized the importance of preservation of historical and high-amenity sites, but the lack of funds is a constant constraint. Such funds as are available should be concentrated on maintenance of existing facilities and the designation of strategic coastal and other areas to be preserved for tourism and regional recreation.

D. IMMEDIATE ACTION

1.49. No immediate action beyond the designation and evaluation of strategic sites is required in tourism in the Karachi Region, but action on sites is vital if the key areas are to be protected properly. It is recommended that a national study of Pakistan's tourism potential be undertaken and appropriate plans be prepared. It is possible that international assistance can be made available for such studies if desired.
1. Existing facilities and their use

A. Trends and Issues

1. Existing facilities and their use

1.150. Within Karachi there are several major facilities. These include the Karachi Zoo, the Race Course, Hill Park, the National Stadium and Clifton Beach.

1.151. Karachi is estimated to have at present roughly 1,036 acres of land under parks and playgrounds, or 0.3 acres per 1,000 population.

1.152. Many inner areas are seriously deficient in space for recreation. Liaquatabad has only a few facilities for a population of 128,000. Lyari, several areas of the central city and most jhuggi areas are also seriously deficient.

1.153. Most of the outer areas have much more space allocated for recreation. Most RDA schemes have from three to four acres per 1,000 population; Korangi and North Karachi have two acres per 1,000; and Aurangi and Qasba have one acre per 1,000 population.

2. User characteristics

1.154. The recreation programme is based upon the characteristics of user groups.

(a) Married men

1.155. Married men have less leisure time than most other groups. Most of their leisure time is used for relaxation at home. They may occasionally go to the City to visit relatives or friends.

(b) Unmarried men

1.156. Unmarried men have more leisure time and are able to use it more fully for recreation. They may relax at home or play keeram, cricket or football. They may walk in the park, go to the cinema or visit with relatives or friends from two to four times a month.

(c) Married and unmarried women

1.157. Married and unmarried women spend more of their leisure time at home, knitting or sewing. They visit daily with neighbors and nearby relatives. They may go to the City to visit relatives. Women do not normally use parks frequented by men. It is not considered good behavior for women to sit in a public park. During field survey work undertaken by the Project staff, several women expressed the desire for recreation facilities for women outside the home and separated from the men.
(d) Children under twelve

1,158. Children under twelve play at home, at a neighbor's house or in the street near the house. They may be taken to the park once a week by the father. It is regarded as important that neighborhood parks be provided close to the home so women can supervise their children at play.

B. OBJECTIVES

1,159. Objectives recommended for recreation include the following:

(a) To reduce existing deficiencies and achieve an equitable spatial distribution of recreation facilities, particularly parks and playgrounds, for all target groups.

(b) To provide adequate public facilities and services such as lights, lavatories and safety and security measures in all major recreation areas.

(c) To improve the accessibility to lower-income groups of Metropolitan and Regional recreation facilities by providing improved public transportation to these facilities.

(d) To ensure the proper use of recreation facilities by Improved land use planning, improved recreation planning and programming, and improved land use control.

(e) To provide recreation facilities for all target groups, with a focus on three particular target groups:

(i) Low-income groups which cannot make use of highly developed, expensive and inaccessible facilities and must be provided with less highly developed, less expensive and more accessible facilities.

(ii) Adult females who seldom are able to use recreation facilities due to cultural constraints and the lack of safety and security measures.

(iii) Pre-school age children for whom facilities are seldom provided and who do not have the use of school facilities.

C. THE PROGRAMME PROPOSED

1. The recreation programme proposed

1,160. The emphasis in the programme proposed should be on the development of facilities at the sub-metropolitan and neighborhood levels. The facilities that should be developed at the various levels are shown in Table XVI.2.1. The joint use of land and facilities should be encouraged wherever possible. Schools, water reservoirs and agricultural land can be used jointly for their primary use and for recreation.

1,161. The climatic constraints of very little rainfall, urban water supply shortage, and very strong winds do not
<table>
<thead>
<tr>
<th>Regional and Metropolitan level</th>
<th>Bathing beaches, nature areas&lt;sup&gt;3&lt;/sup&gt;</th>
<th>Proposed K.M.C. zoo site</th>
<th>Baghe-Ibn-e-Qasim Scheme 5</th>
<th>Park on Race Course ground</th>
<th>Falak Numma Scheme</th>
<th>Existing Hill Park</th>
<th>Quaid-e-Azam National Stadium and Youth Centre</th>
<th>National Exhibition site</th>
<th>Other similar facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>300-400 acres</td>
<td>132 acres</td>
<td>115 acres</td>
<td>90 acres</td>
<td>62 acres</td>
<td>61 acres</td>
<td>60 acres</td>
<td>30 acres</td>
<td></td>
</tr>
</tbody>
</table>

Space standard: 0.15 acres per 1,000 population

<table>
<thead>
<tr>
<th>Sub-metropolitan level</th>
<th>(400,000 population and above)</th>
<th>Stadium and Amphitheatre for games, athletics and public gatherings</th>
<th>Gardens</th>
<th>Other facilities (amusement parks, playgrounds, etc.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10 acres</td>
<td>20 acres</td>
<td>10 acres</td>
</tr>
</tbody>
</table>

Space standard: 0.20 acres per 1,000 population

<table>
<thead>
<tr>
<th>Local and neighborhood levels</th>
<th>(60,000 population)</th>
<th>Fields for organized sports&lt;sup&gt;4&lt;/sup&gt;</th>
<th>Cricket ground</th>
<th>Football ground</th>
<th>Hockey fields</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.0 acres</td>
<td>3.0 acres</td>
<td>3.0 acres</td>
</tr>
</tbody>
</table>

Park with playground for children |
Smaller open spaces for other sports, children’s play and community gatherings<sup>5</sup> |

Space standard: 0.25 acres per 1,000 population

<table>
<thead>
<tr>
<th>All levels</th>
<th>Space standard: 0.60 acres per 1,000 population</th>
</tr>
</thead>
</table>

<sup>a/</sup> Not included in acreage or cost estimates.
<sup>b/</sup> Fields for organized sports should be located adjacent to secondary schools if possible.
<sup>c/</sup> Smaller open spaces for other sports, children’s play and community gatherings should be located at the end of residential blocks.
2. Space requirements and costs

1.162. The space standard proposed for all recreation facilities exclusive of beaches, natural areas and other non-urban facilities is 0.6 acres per 1,000 population. This is double the existing space standard, and it is realistic given the climatic conditions and budgetary limitations of Karachi. An additional 0.3 acres per 1,000 population of effective recreation space would be provided for school-age children in the schools as a part of the education programme.

1.163. The total space required by 1984/1985 at this standard is 4,200 acres, an increase of 2,800 acres over the present.

1.164. The capital costs of recreation facilities exclusive of land costs vary from PRs. 38,000 per acre for playgrounds with minimal facilities to PRs. 50,000 per acre and above for fully landscaped parks with lawns and trees. Maintenance costs vary from PRs. 5,000 to PRs. 10,000 per acre per year. Assuming average capital costs of PRs. 50,000 per acre, average maintenance costs of PRs. 7,500 per acre, and zero land costs, the costs of the programme are shown in Table XVI.2.2.

Table XVI.2.2

<table>
<thead>
<tr>
<th>Year</th>
<th>Population (thousands)</th>
<th>Acres required</th>
<th>Acres developed</th>
<th>Capital costs (PRs. crores)</th>
<th>Operating costs (PRs. crores)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973/1974</td>
<td>4,200</td>
<td>1,400</td>
<td>147</td>
<td>.74</td>
<td>1.18</td>
</tr>
<tr>
<td>1974/1975</td>
<td>4,394</td>
<td>1,547</td>
<td>180</td>
<td>.91</td>
<td>1.28</td>
</tr>
<tr>
<td>1975/1976</td>
<td>4,596</td>
<td>1,709</td>
<td>162</td>
<td>.81</td>
<td>1.42</td>
</tr>
<tr>
<td>1976/1977</td>
<td>4,808</td>
<td>1,899</td>
<td>198</td>
<td>.99</td>
<td>1.57</td>
</tr>
<tr>
<td>1977/1978</td>
<td>5,030</td>
<td>2,087</td>
<td>219</td>
<td>1.10</td>
<td>1.73</td>
</tr>
<tr>
<td>1978/1979</td>
<td>5,262</td>
<td>2,306</td>
<td>243</td>
<td>1.22</td>
<td>1.91</td>
</tr>
<tr>
<td>1979/1980</td>
<td>5,504</td>
<td>2,549</td>
<td>267</td>
<td>1.34</td>
<td>2.11</td>
</tr>
<tr>
<td>1980/1981</td>
<td>5,758</td>
<td>2,816</td>
<td>267</td>
<td>1.48</td>
<td>2.23</td>
</tr>
<tr>
<td>1981/1982</td>
<td>6,023</td>
<td>3,122</td>
<td>296</td>
<td>1.64</td>
<td>2.58</td>
</tr>
<tr>
<td>1982/1983</td>
<td>6,301</td>
<td>3,439</td>
<td>327</td>
<td>1.81</td>
<td>2.85</td>
</tr>
<tr>
<td>1983/1984</td>
<td>6,591</td>
<td>3,800</td>
<td>361</td>
<td>2.00</td>
<td>3.15</td>
</tr>
<tr>
<td>1984/1985</td>
<td>6,900</td>
<td>4,200</td>
<td>400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>14.03</td>
<td>22.09</td>
</tr>
</tbody>
</table>

1.165. The maintenance costs of recreation facilities are higher than the capital costs. They should, therefore, be considered an important component of each project. Efforts should be made to keep both capital and maintenance costs to a minimum.

D. IMMEDIATE ACTION

1.166. No special action is required in the recreation sector. The proposed space standards should be utilized in new projects.
RELIGIOUS FACILITIES

A. TRENDS AND ISSUES.

1,167. Religious institutions enjoy a special status. Land grants are made by the Government and local bodies for mosques, imam-bazars (community centres of the Shia group), temples and churches. Contributions made to these institutions are exempted from income tax.

1,168. Several types of mosque are recognized. The Mohall, or neighborhood, mosque may accommodate 300 to 400 people and serve a population of 5,000 to 10,000 within a radius of a quarter of a mile. It has to be within walking distance of the households it serves. The Jamia, or town, mosque is where people gather for Friday prayers. It may have a capacity of 1,000 to 2,000 persons and serve a population of 100,000 to 500,000 within an area with a radius of up to two miles. The third category of religious gathering place is the Eid-gah, a large open space to be used twice a year, on the ceremonial occasion of Eid. An Eid-gah is usually outside the city limits. Although there is traditionally one Eid-gah in each city, Karachi's continuing increase in size has led to the development of several such gathering places.

1,169. In 1970, just under one per cent of urban land use (approximately 350 acres) was devoted to religious facilities with an additional 2.5 per cent (approximately 1,200 acres) in burial grounds.

1,170. Because of the sacred and sentimental value of religious buildings and burial grounds their initial siting is important. If they are located in the absence of overall plans they may make it difficult to carry out necessary public improvements later. This is the case, for example, with the new arterial road that has been proposed from time to time on the north bank of the Lyari River: many mosques have been built on the proposed right-of-way and it is likely that an alternative routing will have to be developed.
2. OBJECTIVES

1,171. The proposed objectives for religious facilities are the following:

(a) To provide adequate space for religious facilities and burial grounds up to 1985 at the standards suggested for Mohall Mosques and Jamia Mosques.

(b) To locate religious facilities in such a way as to encourage their use for education and other community service purposes as well as for religious activity.

(c) To locate religious facilities in such a way as to avoid conflict with other potential land uses, particularly roads.

C. THE PROGRAMME FOR 1974-1985

1,172. Between 1974 and 1985 approximately 280 additional acres will be required for religious facilities, together with an additional 800 acres for burial grounds. The value of land grants required for this space will be just under RS.3 crores for religious institutions (assuming an land value of RS.20 per square yard) and just under RS.4 crores for burial grounds (assuming an average value of RS.10 per square yard).

1,173. For the 1974-1985 period approximately 270 Mohall Mosques will be required (serving 10,000 population each), together with approximately 25 Jamia Mosques (serving 100,000 population each) and several Eid-gahs.

1,174. Religious facilities should be grouped with other relatively long-lived community facilities, including centres for education, health and social welfare services, to encourage multi-purpose use of religious facilities and to help to establish focal points for community activity. A grouping of this kind has been incorporated in the first Metroville project described in Chapter XXIII.

D. IMMEDIATE ACTION

1. Site designation

1,175. Sites for major religious facilities, including Eid-gahs and Jamia Mosques, and major burial grounds for the period 1974-1985, should be designated immediately.

2. Prohibition of location outside designated areas

1,176. The establishment of religious facilities and burial grounds outside areas designated for development in the period 1974-1985 should be prohibited without the prior approval of the reconstituted Policy Advisory and Steering Committee recommended in Chapter XXV, or the agency to which the responsibility for such approvals is delegated by the Committee.
A. TRENDS AND ISSUES

1,177. The cantonments shown in the map Cantonments and Defence Lands when they were established in 1940 were expected to be well outside the urbanizable area. They now lie in the heart of the metropolis and in the path of its growth to the west, the northeast and the southeast. The 29,000 acres of cantonments and other lands under defence control could accommodate approximately 2,250,000 population, plus industry and other urban uses, at the gross urban density of 30 persons per acre proposed for new growth between 1974 and 1985.

1,178. The present locations are vulnerable from coastal attack. They constitute a serious hazard for the civilian populations that have developed around them.

1,179. Karachi Cantonment has been completely surrounded by civilian population and is in the very heart of the City. It cannot be treated as a separate entity for planning and development. No comprehensive planning and development is possible as long as Karachi Cantonment remains as an island in the City. Major metropolitan road networks and land uses have to be linked across the Cantonment area.

1,180. The Brigh Road Pakistan Air Force area is now completely surrounded by civilian urban development. A large area (about 700 acres) in the northern part of the Brigh Road Cantonment is wholly unutilized.

1,181. Malir Cantonment is already very extensive and is greatly underutilized. The proposed extension of this Cantonment toward the west would adversely affect Scheme 33, which is the only major area for the expansion of the City to the northeast.

1,182. The Mauripur defence area is blocking the westward expansion of the City toward Hauke Bay. The proposed expansion of Mauripur across the Hab Chauki road in the Baldia area is highly undesirable as it would pre-empt a large part of the good residential area near S.I.T.E., which is a major employment centre.
B. OBJECTIVES

1.183. The following objectives are recommended for defence lands:

(a) To establish essential new defence areas in the Karachi Metropolitan Region in locations that are strategically secure and well serviced and that do not constitute hazards for the civilian population.

(b) To convert the cantonments and defence lands in or near existing and foreseeable urban areas in the Region that are not essential for defence purposes to normal urban uses.

C. THE PROGRAMME FOR 1974-1985

1.184. It is essential to plan for a phased conversion of cantonments and other defence lands to normal urban use.

1.185. The military areas have a very high potential land value in urban use. Assuming only 50 per cent of their total area to be marketable and with conservative assumptions concerning land values (PRs. 100 per square yard for Karachi Cantonment and the Drigh Road PAF area and PRs. 20 per square yard for Masroor Air Base and Malir Cantonment), the total market value of Karachi Cantonment, the Drigh Road PAF area, Masroor Air Base and Malir Cantonment would be approximately PRs. 294 crores.

1.186. A long-term plan should be established for converting the major cantonments and other defence lands into urban use.

D. IMMEDIATE ACTION

1. Conversion of defence areas for urban use

1.187. Collaboration should be initiated between the defence authorities and the Master Plan Department in planning the conversion of the Karachi Cantonment area by 1985 (already begun through the working group established for the Jacob Lines project); similar collaboration should be undertaken to prepare for the conversion of Masroor Air Base and the Drigh Road PAF area shortly after 1985. Included in the latter is the designation of the right-of-way for the proposed extension of Rashid Manhas Road across the Malir River into Korangi and the finalization of a schedule for the construction of this extension.

2. Defence areas policy

1.188. A policy should be established to avoid creating major new defence areas or extensions to existing areas in or near existing or foreseeable urban areas in the Region; included in this should be a decision not to extend Malir Cantonment or the area under the control of the Karachi Cantonment Board.
CHAPTER XIX

MANPOWER, EMPLOYMENT AND LABOUR POLICIES AND SERVICES

A. TRENDS AND ISSUES

1.181. Karachi, like many other cities in the developing world, faces a manpower and employment crisis. Visible and invisible unemployment is widespread among both the uneducated and the educated. The productivity of labour is low. Technical and managerial skills are in short supply, while there is a surplus of job-seekers with general education backgrounds.

1.180. Studies of manpower requirements for Pakistan have shown that there is an oversupply of persons trained in the humanities, law, science and commerce, while there is a shortage of skilled craftsmen and technicians. It is believed that the same conditions exist in Karachi.

1.191. The dimensions of the Metropolitan Area's potential manpower and employment problem are considerable; approximately 2,145,000 non-agricultural jobs may be required by 1985, or over 1,000,000 new jobs between 1974 and 1985.

1. The potential for job creation

1.192. There should be a concern for the most efficient utilization of labour and creation of employment opportunities in virtually all decisions involving employment and labour in the Metropolitan Area. In relation to other cities in Pakistan, Karachi is fortunate in having a considerable supply of entrepreneurial talent and technical and management skills which should be utilized as effectively as possible even while action is undertaken to expand and improve manpower resources. The potential for job creation in the key sectors of the economy is as follows.

(a) Agriculture

1.193. There is considerable scope for growth in employment outside the Metropolitan Area in agriculture. The agricultural potential identified in Chapter IX suggests that substantial employment can be generated in intensive vegetable farming and in milk and meat production if urban waste water and regional groundwater can be mobilized more fully. Development of this kind would offer employment opportunities in activities that should be particularly attractive, in terms of the skills they require, for recent immigrants.

1.194. The potential of the Arabian Sea has not yet been fully assessed. There is believed to be considerable scope for expansion in employment in fishing and fish-product processing, including processing for export.

(b) Manufacturing

1.195. The recent devaluation of the rupee should make domestic technologies more attractive to investors. As described more fully in Chapter X, small-scale manufacturing should be supported much more fully than it is at present. Small firms should be encouraged to locate within and in close proximity to large-scale industrial complexes and in residential areas in order to promote the integration of the small-scale and large-scale sectors and increase employment opportunities for low-income groups. Consideration should be given to the encouragement of foreign firms to utilize Karachi's low-wage labour and extant business services for export manufacturing. Large-scale and small-scale manufacturing together may provide a total of 585,000 jobs by 1985.

(c) Construction

1.196. The recommendations contained in this report for regional water resources, regional transport, housing, urban water supply, sewerage, drainage, river management and rehabilitation, electricity and gas, urban transport and communications should result in a rapid upsurge in construction activity and an increased role for the private sector in construction. The existing labour-intensive technologies should be continued wherever it is economic to do so. So-called modern capital-intensive technologies should not be adopted unless absolutely necessary. Contractors on public jobs should be required to submit cost profiles of their operations showing clearly the labour component, and the efficient utilization of labour should be included among the criteria used to evaluate applications for construction financing. It may be possible to generate a total of approximately 180,000 jobs in the construction and utilities sector by 1985. Small construction firms should be supported with technical assistance much more fully than they are at present, and construction finance should be expanded rapidly.

(d) Transportation

1.197. The transportation sector is also expected to play a key role in job creation. The expansion of port activities proposed in the existing port and the opening of Port Qasim will generate several thousand new jobs by 1985. Employment opportunities will be augmented also by the proposed improvements in Metropolitan passenger mass transit. The recommendations for retention of the existing small-scale goods
transport modes and for expansion of taxi and bus services and eventually the light rail system are designed (among other things) to make the most efficient use of Karachi's labour supply. The existing autorickshaw, tonga, victoria, camel cart and donkey cart services should be permitted to continue to operate as long as they are able to provide services for the lower-income groups and at competitive prices. Small transport firms and individual operators should be supported with technical and financial assistance much more fully than they are at present. It should be possible to generate a total of approximately 220,000 jobs in transportation by 1985.

2. Population growth

1,198. The rate of population growth of the Metropolitan Area is so high that it reduces the resources available for job creation and makes the reduction of unemployment difficult. Population planning programmes should be initiated in both the rural and urban areas of Pakistan to reduce long-run population growth. Recommendations for Karachi specifically are contained in Chapter XXI, Health and Population Planning. Projections are contained in Chapter VI, Metropolitan Growth.

8. OBJECTIVES

1,199. The following objectives are recommended for manpower, employment and labour programmes:

(a) To encourage the full utilization of the labour force, high levels of employment and the highest level of production possible with the manpower, capital and other resources available.

(b) To support the provision of primary and secondary, adult and informal educational services, health services, transportation, housing and sanitation services necessary over the long run to improve labour productivity and increase employment and incomes for the lowest-income groups.

(c) To support the development of the technical training services and higher educational services necessary for the development of skilled and managerial manpower resources to the extent that there is a real need for such manpower in the various manpower and skills categories.

(d) To improve the situation of the employed worker by establishing safe, healthful and psychologically rewarding work opportunities and providing for effective participation by workers in decisions on employment and working conditions that affect their welfare significantly. Wages and fringe benefits should be maintained at the level of the marginal productivity of labour for firms of all sizes in order to maintain the conditions necessary for approximately full employment.

(e) To provide information on job opportunities and job availability, facilitate the job-to-job and geographical mobility of members of the labour force and accomplish the most efficient assignment of the members of the labour force to various jobs.
1. Education and technical training

1,201. In order to increase the upward mobility of the lowest-income groups and to increase the productivity of labour it is proposed that the primary, secondary and adult educational programmes be expanded and improved. Basic literacy skills should improve the productivity of low-level technical manpower, in particular.

1,202. Technical training programmes should be improved and expanded. It is proposed that technical training be initiated in the secondary schools. It is also proposed that public programmes be integrated more fully with the private sector by conducting part of the programme in the factories and technical training centres be located in the industrial zones so that the facilities of the private sector can be made available for the programme.

1,203. It is recommended that courses in the humanities, law, science, commerce and other fields in which there is a surplus of graduates not be expanded, and that young people be encouraged to undertake training in other fields. Training programmes for skilled teachers, doctors and nurses should be expanded.

1,204. These proposals are described more fully in Chapter XX, Education and Training.

2. Labour policy

1,204. The Government adopted in February 1972 a new labour policy “designed to protect the rights of organized workers in urban areas and to create an equitable environment in which both workers and employers can work together harmoniously for the achievement of higher productivity.” The new policy includes provision for additional worker participation in management, an increase in workers' shares of profits, abolition of the workers' share of social security payments and an increase in payments by employment, the application of the Payment of Wages Act, 1936 and the Industrial Employment (Standing Order) Ordinance, 1968 to labour employed by contractors, a requirement for employers to provide employees with educational expenses up to matriculation for one child (with the Government responsible for the education of other children in the families benefitting from this), a programme of housing and other facilities for workers, and the establishment of a quasi-judicial authority to deal with labour practices and promote effective trade unionism.

1,205. These labour reforms will improve the situation of the workers. They are a badly needed first step toward a complete reformation of the role of labour in development, but it should be recognized that they are a first step and that labour policy should be reviewed more thoroughly.


\[3/\text{Ibid.}\]
during the next several years. As policy is reviewed and developed, care should be taken that the broad perspective of the employment and manpower problem be kept in mind. The difficulty is in improving the situation of the employed worker while not reducing the employment opportunities of the labour force as a whole. Proposed increases in wages and fringe benefits should be examined carefully to ensure that they are kept equal to the marginal productivity of labour, and labour legislation should be structured so that it will encourage employers to have a large number of employees working normal hours rather than a small number of employees working long hours.

3. Employment exchanges

1.206. Employment exchanges have in the past been of limited usefulness, perhaps due to reliance upon a more traditional system of job recruitment and job search, and to the insufficiency of the exchanges themselves.

1.207. It is recommended that a two-level hierarchy of employment exchanges be considered. Such a system would be based upon one or more central exchanges serving the entire Metropolitan Area, with local exchanges in each community, in a highly accessible location such as the community centres proposed in the Metroville Programme.

1.208. The National Development Volunteer Programme was initiated on 30 April 1973 to mobilize unemployed, uneducated manpower. Twelve thousand persons have been registered at Registration Centres set up in Karachi, and placement is now underway. This programme should be linked with improvements in the operations of the basic employment exchange system.

D. IMMEDIATE ACTION

1. Labour reforms

1.209. The labour reforms described above are a badly needed first step toward reformation of the role of labour in development. They should be reviewed continuously during the next several years to ensure that they establish desirable working conditions and provide for the effective participation of labour in decisions on employment and working conditions.

2. Employment exchanges

1.210. It is recommended that an employment exchange be established in the administrative centre of the Metroville. It should provide recruiting services for the firms located in the Metroville and job services for the persons moving into the Metroville.
A. OBJECTIVES

1.211. The objectives outlined below are similar to those of the Government policy announced in 1972. They attempt to identify priorities, resolving some of the questions already raised, and recognizing the limitations imposed by available finance. Generally these objectives and proposals apply equally to the Karachi Urban Area and to urban centres which may develop in the Region, although in the latter centres it can be expected that special emphasis will be placed on agricultural training and related technical courses that reflect local activities.

1.212. The major programme objectives are as follows:

(a) To provide access to at least minimum educational services for all segments of the population through widespread literacy programmes and primary education.

(b) To provide free education in Government schools up to matriculation standard.

(c) To improve significantly the quality of educational services.

(d) To provide specialized training to meet future manpower needs.

(e) To achieve specialized training through co-operation and co-ordination between industry and technical training institutes, and through the provision of agricultural training centres in rural areas.

(f) To reduce illiteracy in all age groups of the population as much as possible by providing free literacy training, and by actively encouraging all those who are illiterate to take advantage of it.

(g) To encourage widespread understanding of personal and environmental hygiene, nutrition, family planning, household budgets and urban services by means of radio, television, film and local courses.

(h) To encourage the undertaking of community improvement projects through both formal and informal training in self-help techniques.

8. THE PROGRAMME RECOMMENDED

1,213. The programme recommended is to provide educational services for the urban population of the Region (which is projected to reach 6.9 million by 1985). It should be remembered that there is expected to be a substantial rural population in the Region also, possibly just under 1 million by 1985. Additional provisions must be made for educational services for this non-urban population but the formulation of the non-urban programme is outside the terms of reference of the present project.

1. The general education programme

1,214. Among the most important objectives of this programme are the achievement of universal education, at least to primary school level, and the provision of free education to matriculation level for all who desire it. In keeping with these objectives, enrollment targets of 100 per cent in primary education, 60 per cent in secondary education, and 8 per cent in college education are recommended for 1985.

1,215. To reduce costs and make maximum use of buildings and facilities, it is proposed that primary and secondary schools and colleges be operated in two shifts per day, as is already common practice in many schools in Karachi. Extra administrative staff and skills are required for large schools, and construction costs are not significantly reduced when size is increased. For these reasons it appears that enrollment should be limited to 400 to 600 per shift at each school, and a value of 400 has been adopted here.

1,216. Table XX.1 shows future requirements for schools and colleges, based on forecasts of school-age population and desired enrollment levels. Through 1985 an additional 59 primary schools, 365 secondary schools and one college will be required.
Table XX.1

Additional requirements for schools, staff and land, 1974-1985.

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Primary Schools</th>
<th>Secondary schools</th>
<th>Colleges</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-6</td>
<td>363 000</td>
<td>151 160</td>
<td>50 500</td>
<td>564 660</td>
</tr>
<tr>
<td>1974 School enrollment</td>
<td>837 000</td>
<td>739 000</td>
<td>650 000</td>
<td>2 226 000</td>
</tr>
<tr>
<td>1975 Per cent enrollment</td>
<td>100</td>
<td>60</td>
<td>8</td>
<td>59.8</td>
</tr>
<tr>
<td>1975 desired enrollment</td>
<td>837 000</td>
<td>443 400</td>
<td>52 000</td>
<td>1 332 400</td>
</tr>
<tr>
<td>Additional school capacity</td>
<td>593</td>
<td>365</td>
<td>1</td>
<td>959</td>
</tr>
<tr>
<td>required in 1985</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional schools required in 1985</td>
<td>593</td>
<td>365</td>
<td>1</td>
<td>959</td>
</tr>
<tr>
<td>Additional teachers required in 1985</td>
<td>11 860</td>
<td>10 220</td>
<td>20</td>
<td>22 100</td>
</tr>
<tr>
<td>Additional total staff required in 1985</td>
<td>14 232</td>
<td>16 740</td>
<td>56</td>
<td>31 078</td>
</tr>
<tr>
<td>Additional land required in 1985 (acres)</td>
<td>593</td>
<td>548</td>
<td>2</td>
<td>1 143</td>
</tr>
</tbody>
</table>

*2/ 1972 school enrollment projected to 1974.*

2. Specialized education programmes

(a) Training of skilled craftsmen and technicians

1,217. Most training of skilled craftsmen and technicians occurs at present in the factories, by apprenticeship in small workshops and in the armed forces. It is necessary to expand public technical training programmes, but it is proposed that they be linked more closely with private industry. Technical training centres should be located in industrial areas. Students should be trained for a period of three years, two of which should be spent in actual work situations in factories and businesses and one of which should be spent in training centres. This will ensure that they receive practical experience of the type they will need when employed, and they will be better prepared for the working conditions they will encounter after training. Such apprenticeship training has been found to be less costly and faster than school-only training, the equipment available on the job is usually better, and the training received is necessarily geared to the specific requirements of the job. The requirements of this programme are shown in Table XX.2.
Table XX.2
Requirements for technical training centres, staff and land, 1985

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985 estimated enrollment</td>
<td>90,000</td>
</tr>
<tr>
<td>Student-years required in 1985</td>
<td>30,000</td>
</tr>
<tr>
<td>Student-years per centre per year</td>
<td>200</td>
</tr>
<tr>
<td>Centres required in 1985</td>
<td>150</td>
</tr>
<tr>
<td>Teachers required in 1985</td>
<td>1,800</td>
</tr>
<tr>
<td>Total staff required in 1985</td>
<td>3,150</td>
</tr>
<tr>
<td>Land required in 1985 (acres)</td>
<td>225</td>
</tr>
</tbody>
</table>

1,218. One of the objectives of the Government's new education policy is the integration of general and technical education by providing general industrial and home economics courses in lower secondary schools and specialized industrial, economics, business and education courses in higher secondary schools. Cost estimates for the lower secondary school programme suggest that this programme would be quite expensive relative to general and adult education programmes and it should be evaluated carefully for this reason.

(b) Training of teachers

1,219. An estimated 22,000 primary and lower secondary school teachers will be needed by 1985. The existing teacher training schools currently produce 840 graduates per year and without losses would supply approximately 7,500 teachers during the period 1974-1985. Most of the remaining 14,500 teachers have to be trained in new schools.

1,220. Three new centres will be required for primary and lower secondary teachers and one small centre will be required for upper secondary teachers. These should be constructed early in the planning period in order to meet the forecast demand for teachers. Table XX.3 summarizes the requirements for additional teachers' training schools in the period 1974-1985.
Table XX.3
Additional requirements for teachers: training schools, staff and land, 1974-1985

<table>
<thead>
<tr>
<th></th>
<th>Primary and lower secondary teachers</th>
<th>Upper secondary teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers from existing centres, 1974-1985</td>
<td>4,000</td>
<td>1,500</td>
</tr>
<tr>
<td>Teachers required, 1985</td>
<td>17,000</td>
<td></td>
</tr>
<tr>
<td>Additional teachers required by 1985</td>
<td>13,000</td>
<td>1,500</td>
</tr>
<tr>
<td>New centres required 1974-1985</td>
<td>38/</td>
<td>1</td>
</tr>
<tr>
<td>New teaching staff required, 1974-1985</td>
<td>80</td>
<td>10</td>
</tr>
<tr>
<td>Land required by 1985 (acres)</td>
<td>4.5</td>
<td>1.5</td>
</tr>
</tbody>
</table>

In addition to two existing establishments to be used for retraining currently unemployed teachers.

1,221. The above forecasts are rather conservative in that no account is taken of retirement of teaching staff during the planning period, or of the proportion of currently unemployed qualified teachers who will be unwilling to re-enter teaching service. Future requirements might well be 20 per cent or more above those shown because of these factors.

(c) Training of doctors and nurses

1,222. Future needs in medical staff required for the proposed health development programme are forecast and analysed in Chapter XXI. The training of nurses is part of the health programme and will take place within new hospitals. Hence no staff needs or costs are included here in the requirements for education.

5. Adult and informal education programmes

1,223. The main emphasis in education is rightly placed on formal training but significant sections of the population, many of them in the lower-income categories, remain out of reach of the formal training programmes. The following adult and informal education programmes are proposed.

(a) The adult literacy programme

1,224. It is estimated that in 1973 there were about 1.5 million people in Karachi of 10 years of age or older who were illiterate. It is proposed that a massive effort be made during the period 1974-1985 to eliminate illiteracy in this group. It is, of course, very unlikely that complete success will be attainable, but it is hoped that the objective can be approached even if not completely achieved.
1,225. The programme proposed is based upon the objective of 100 per cent literacy by 1985. This conforms with, but goes beyond, the proposed Government literacy programme which was providing training for 40,000 illiterate people in 1973. To train 1.5 million people in 11 years, it will be necessary to do so at the rate of 136,000 per year.

1,226. It is proposed that training be given in six-month courses in classes of 40. This will require 1,700 teachers. No special centres will be needed as courses can be organized in school buildings in the evenings and in work places.

1,227. About half of the illiterate people in Karachi are employed in economic sectors such as large-scale manufacturing, public services, including Government service, public utilities, and transportation. In these cases it might be reasonable to expect employers to undertake literacy training for their staff. Such a scheme was instituted in Iran where employers participated in a "functional literacy programme" oriented to the solving of work problems and the upgrading of manpower. In Pakistan such a scheme could be introduced using qualified staff or part-time teachers as instructors. It might also be desirable for military personnel to serve as teachers. The costs presented below are calculated for the whole programme, but these could be reduced (perhaps halved) through employer participation.

(b) Informal education through mass media

1,228. Television, radio and the cinema are probably the most effective of all channels for informal education. If properly prepared, educational material can be presented as entertainment to be readily accepted by a wide audience. Subjects which can be treated in this way include, in approximate order of priority, literacy, family planning, nutrition, personal and environmental hygiene, mother and child care, traffic education, household budgeting, and the administrative organizations of the city, the services they provide, and the ways in which the city resident can use the services.

1,229. Public television receivers could be installed in parks and community centres in lower-income areas to reach audiences who would not normally have access to television programmes, and educational programmes could be screened several times weekly through one channel.

(c) Community development programmes

1,230. Some of the community development activities proposed for the Karachi Urban Area are concerned directly with informal education. They are described later in Chapter XXII which deals with Social Welfare Services.

2/ This total will be reduced by deaths during the planning period and by people unable or unwilling to undertake training, but on the other hand, at least during the early years of the period, these reductions may be offset by children who fail to enroll in primary schools.
4. The geographic distribution of services

1.231. Because of the general shortage of schools for primary and secondary education, there are few areas in Karachi which have adequate school capacity. The worst areas have been identified by comparing local school capacity available with the school age population in the area. These include the Old Town area around Lala Market, Lyari, Ranchore Lines, Jacob and Gulshan Lines, Shershah, Baldia, Aurang, Mahomedabad, the Federal "H" area, North Karachi, Korangi, Landhi and Malir and Model Colonies. They should be given highest priority in provision of primary and secondary schools.

1.232. By 1985 there should be one primary school with an enrollment of 800 for each 6,000 population, one secondary school with an enrollment of 800 for each 11,000 population, and one college with an enrollment of 1,280 for each 170,000 population. These standards should be adhered to as closely as possible in locating new schools and colleges, in order to achieve an acceptable geographic distribution of services.

5. Curriculum, staffing, teaching materials and construction standards

1.233. The educational programme should place more emphasis on improvements in the curriculum, the teaching staff and teaching equipment than upon improvements in physical construction standards.

1.234. The curriculum should encourage creative and independent thinking and contain courses on practical subjects such as health and sanitation, household management and work-related skills and crafts.

1.235. Instances of one teacher instructing a class of 50 primary school students or 80 secondary school students are not exceptional. The educational programme here proposed recommends a maximum class size of 40 students.

1.236. Teaching equipment should include instruction materials, free expression materials, library books and small desks for primary schools, and instruction materials, free expression materials, library books, chairs and tables and laboratory equipment for secondary schools.

1.237. The use of inexpensive building materials, designs, and construction techniques is also strongly recommended. The provision of adequate space, capable staff, and good equipment will do much more to lift education standards than the most lavish designed school buildings. It is estimated that schools and colleges could be built in Karachi for Pkr. 15 per square foot of covered area (Pkr. 20 per square foot for laboratories). This would provide a single-storeyed concrete block school with concrete floors, semi-pucca roof with reinforced concrete beams, with a steel gate, but without doors or windows. Its lift span is estimated at 30 years. The costs per school are shown in Table XX.4.

These estimates were made before the recent drastic increases in building costs and they undoubtedly result in underestimates of current costs. They should be revised accordingly in detailed budgeting in the next stage of planning.
### Table XX.4
Costs per school-proposed education programme

<table>
<thead>
<tr>
<th></th>
<th>Construction</th>
<th>Equipment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary schools</strong></td>
<td>87,000</td>
<td>13,000</td>
<td>100,000</td>
</tr>
<tr>
<td><strong>Secondary schools</strong></td>
<td>125,000</td>
<td>125,000</td>
<td>250,000</td>
</tr>
<tr>
<td><strong>Colleges</strong></td>
<td>250,000</td>
<td>290,000</td>
<td>530,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Personnel</th>
<th>Maintenance and operation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary schools</strong></td>
<td>103,000</td>
<td>67,000</td>
<td>170,000</td>
</tr>
<tr>
<td><strong>Secondary schools</strong></td>
<td>230,000</td>
<td>53,000</td>
<td>283,000</td>
</tr>
<tr>
<td><strong>Colleges</strong></td>
<td>320,000</td>
<td>20,000</td>
<td>340,000</td>
</tr>
<tr>
<td><strong>Technical training centres</strong></td>
<td>111,000</td>
<td>5,000/</td>
<td>116,000</td>
</tr>
<tr>
<td><strong>Teacher’s training centres</strong></td>
<td>300,000</td>
<td>60,000</td>
<td>360,000</td>
</tr>
</tbody>
</table>

a/ Primary and lower secondary schools teacher training centres only.

b/ Materials provided free of charge by participating firm

1,238. Details of the cost estimates are presented in separate reports. 4)

6. The costs of the programme for education

1,239. Estimates of cost have been prepared for all aspects of the proposed education development programme. These exclude the costs of land required for schools and centres, and the preparation of the television and cinema films to be used in the mass media programmes.

In almost all cases costs are based on the provision of new buildings for all additional schools and training centres. A two-shift operation is recommended to make maximum use of these buildings. It is nonetheless strongly recommended that these costs be reduced further wherever possible by using any available buildings which are vacant during some hours of the day for educational purposes. Examples include existing and future schools, which could also serve as adult education or community centres; mosques, which traditionally have played a role in education, and buildings such as those at Karachi University and the Institute of Business Administration which have excellent facilities and may often be unused for long periods.

The total costs for the various components of the proposed educational programme are presented in Table XX.5. The most significant capital cost items are technical training centres (PRs.19.1 crores), secondary schools (PRs.9.1 crores) and primary schools (PRs.5.8 crores).

**Table XX.5**

**Summary of cost – proposed education programmes, 1974-1985**

<table>
<thead>
<tr>
<th>Capital costs 1974-1985 (PRs. crores)</th>
<th>Construction</th>
<th>Equipment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary schools</td>
<td>5.153</td>
<td>0.777</td>
<td>5.930</td>
</tr>
<tr>
<td>Secondary schools</td>
<td>4.553</td>
<td>4.556</td>
<td>9.109</td>
</tr>
<tr>
<td>Colleges</td>
<td>0.023</td>
<td>0.028</td>
<td>0.051</td>
</tr>
<tr>
<td>Technical training centres</td>
<td>7.748</td>
<td>11.325</td>
<td>19.073</td>
</tr>
<tr>
<td>Public television receivers</td>
<td>-</td>
<td>0.271</td>
<td>0.271</td>
</tr>
<tr>
<td>Teacher's training centres</td>
<td>0.047</td>
<td>0.050</td>
<td>0.097</td>
</tr>
<tr>
<td>Total capital costs</td>
<td>17.532</td>
<td>17.009</td>
<td>34.551</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recurring costs 1986 (PRs. crores per annum)</th>
<th>Personnel</th>
<th>Maintenance and operations</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary schools</td>
<td>6.120</td>
<td>3.977</td>
<td>10.097</td>
</tr>
<tr>
<td>Secondary schools</td>
<td>8.410</td>
<td>1.907</td>
<td>10.317</td>
</tr>
<tr>
<td>Colleges</td>
<td>0.032</td>
<td>0.002</td>
<td>0.034</td>
</tr>
<tr>
<td>Technical training centres</td>
<td>1.660</td>
<td>0.075</td>
<td>1.735</td>
</tr>
<tr>
<td>Teacher's training centres</td>
<td>0.101</td>
<td>0.020</td>
<td>0.121</td>
</tr>
<tr>
<td>Teacher's retraining scheme</td>
<td>0.030</td>
<td>0.005</td>
<td>0.035</td>
</tr>
<tr>
<td>Literacy programme</td>
<td>0.163</td>
<td>0.264</td>
<td>0.427</td>
</tr>
<tr>
<td>Total recurring costs</td>
<td>16.516</td>
<td>6.188</td>
<td>22.690</td>
</tr>
</tbody>
</table>

**Notes:**

a/ Costs incurred in 1974.

b/ These recurring costs will rise to the value shown only at programme completion. In intermediate years they will be lower.

c/ Constant recurring costs each year, 1974-1985.

d/ Constant recurring costs each year, 1974-1995.
1.242. The total annual capital and operating costs for the programme period are shown in Table XX.6. Capital costs for continuing programmes are assumed to be uniformly spread over the 11-year period, and the associated operating costs at any stage of the programme are assumed proportional to capital investment up to that time. Costs of other short-term programmes (literacy, teacher training) have been added to these 11-year programme costs. The capital costs per annum are Rs.1.1 crores, while operating costs range from Rs.1.5 crores in the programme's first year to Rs.21.7 crores in the final year. The total of all costs for the entire 11-year period is Rs.162.4 crores.

Table XX.6

Annual costs of education development programme (Rs. crores)

<table>
<thead>
<tr>
<th>Year</th>
<th>Capital Costs</th>
<th>Operating Costs</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974/1975</td>
<td>3.141</td>
<td>1.534</td>
<td>4.675</td>
</tr>
<tr>
<td>1975/1976</td>
<td>3.141</td>
<td>1.556</td>
<td>4.697</td>
</tr>
<tr>
<td>1978/1979</td>
<td>3.141</td>
<td>1.621</td>
<td>4.762</td>
</tr>
<tr>
<td>1983/1984</td>
<td>3.141</td>
<td>1.731</td>
<td>4.872</td>
</tr>
<tr>
<td>1984/1985</td>
<td>3.141</td>
<td>1.753</td>
<td>4.894</td>
</tr>
<tr>
<td>Total</td>
<td>34.351</td>
<td>127.863</td>
<td>162.414</td>
</tr>
</tbody>
</table>

A/ Includes all construction and equipment costs.  
B/ Includes all personnel, materials and maintenance costs.

C. IMMEDIATE ACTION

1. An investigation of possibilities for reducing educational costs

1.243. Measured by current standards, the estimated costs for the proposed education programme are very high. The total cost for the first year of the programme is almost three times the 1972/1973 education development budget for the same items allocated by the Sind Government and the K.M.C. for Karachi. It is thus obvious that all possible steps should be taken to reduce the public costs of these programmes. Several possibilities have already been suggested.
These include the participation of employers in literacy and technical training programmes, the involvement of military personnel as literacy instructors, the use of existing buildings wherever possible as centres for both formal and informal education and the encouragement of community members to participate as much as possible in development. A last, but very important consideration is whether private schools and colleges should again be permitted to contribute to educational services. These and all other possibilities of reducing educational costs without curtailing the programme should be investigated as a matter of urgency.

2. A review of budget allocations

1,244. An immediate review should be made of possibilities whereby budget allocations for education can be increased, if necessary at the cost of reduced funds for road construction, public buildings or other less essential sectors.

3. An analysis of manpower demands

1,245. An analysis of the future manpower demands of Karachi and the ways in which educational services can most effectively meet these demands, is needed to avoid investments in developing skills which are not in demand while other skills are in high demand.

4. Consultation to expand the literacy programme

1,246. Consultation should be undertaken between the agencies for Education, the K.M.C. and defence agencies to expand the Government literacy programme by training more teachers and enlisting the aid of Defence personnel.

5. Consultation on non-formal education and apprenticeship training

1,247. Consultation should be undertaken between the agencies for Education and Health and Social Welfare, the Pakistan Television Corporation and the Karachi Chambers of Commerce regarding non-formal education through the mass media and regarding apprenticeship training schemes.

6. Participation in the Metroville programme

1,248. An experimental programme of community participation, and an investigation of the proposed standards for school buildings, should be included in the proposed Metroville programme. The Metroville is a testing place for many of the proposals contained in this chapter. The various education agencies should participate fully throughout the course of the programme. They should regard it as an opportunity to develop and test new approaches to education and training.
A. OBJECTIVES

1,249. The objectives of the programme proposed for Karachi conform to the basic objectives of the Government Health Scheme - to bring both curative and preventive health services within easy reach of the common man while recognizing the limited financial resources likely to be available. The basic objectives are as follows:

(a) To raise general standards of health as quickly as possible by the use of preventive health measures, including public education, and improvement of physical conditions which influence health.

(b) To provide free Government health services, both preventive and curative, to all those who need them.

(c) To provide the best possible access, at least to minimum health services, for all segments of the population, in all areas of the City.

(d) To encourage the widespread practice of population planning by extensive public education and provision of inexpensive contraceptives, with the objective of reducing Karachi's crude birth rate significantly by 1985.

B. THE PROGRAMME RECOMMENDED

1,256. As in the case of the programme for education and training, the programme for health and population planning is for the urban population of the Region.

1. Preventive services

1,251. Preventive health programmes are presently carried out by a number of organizations, each with responsibility

1/ Health Division, Government of Pakistan, People's Health Scheme. February-March 1972.
for different problems. It is proposed in the Government Health Scheme that because these programmes are overstuffed, expensive and not very effective, they should be reduced in scope. This conclusion is supported by the Karachi Planning Project. To replace the existing programmes it is proposed by the Project that the community health centre (the staffing and functions of which are described later) be the unit with major responsibility for integrated preventive and curative services, in co-ordination with community development centres and schools. In some aspects of the proposed programme outside assistance will be required, but here the involvement of community organizations is very desirable and acts as a catalyst in stimulating programme implementation.

1,252. The preventive health programme proposed has five main aspects: health education, improvement of water supply, sewerage and refuse collection, improved food quality control, population planning and inoculation and malaria eradication.

(a) Health education

1,253. Health education should be focused on low-income and uneducated members of the community and should aim at fostering better understanding of personal and environmental hygiene, nutrition, diet, mother and child health care, vaccination, road safety and population planning. This information would be imparted to the general population through health centres and mass media, and to children in their schools.

1,254. It is proposed to organize evening health courses in the health centres conducted by doctors and nurses, population planning advisers and social workers. These courses and their staffing can be arranged jointly with local community centres. Press, radio, television and the cinema are ideal media for the dissemination of health information and should be used intensively. They are especially effective if they are reinforced by the personal support of respected community leaders.

1,255. Health education should become a compulsory subject for all students in both primary and secondary schools. This would not only encourage sound health practices in the coming generation, but would also provide a channel via the children to other family members.

(b) Improvement of water supply, sewerage and refuse collection

1,256. Environmental sanitation is an absolutely basic part of an integrated health programme. The policies recommended are described in the chapter dealing with water supply, sewerage, drainage and refuse collection. Much greater investment in these facilities is essential if adequate standards of living are to be achieved. An emphasis on environmental sanitation is consistent with the emphasis on preventive, rather than curative, health programmes.

(c) Improved food quality control

1,257. Improved food quality control incorporating less wasteful and more hygienic food production, processing, storage and handling should be part of the preventive
health service programme. Food adulteration is a much more serious health hazard than is generally recognized. To reduce it, it is necessary to update food laws and, most importantly, enforce the updated laws. Regulations such as the West Pakistan Pure Food Ordinance, 1960, need thorough revision to make them more realistic and more effective. Periodic revision of pure food laws is essential in view of the continuing evolution of techniques for both adulteration and detection.

(d) Population planning

1,258. It is recommended that the main responsibility for the supply of population planning information and the distribution of contraceptives be given to local health centres. This conforms with the concept of integrated health services and with the objectives of the Government Health Scheme. It is proposed that two population planning officers be on the staff of each health centre, with the task of providing information, distributing contraceptives and organizing the family planning aspects of health education courses.

1,259. It is hoped that by 1985 Karachi's crude birth rate can be reduced from its present level of 47 births per thousand population to 22. This would require an increase in the percentage of married couples using family planning methods to 30 per cent by 1981. If this target is achieved, 330,000 couples will practice family planning, and births in 1985 could be reduced to a total of 154,000. This would correspond to a crude birth rate of 22.3 per 1,000 population. If 200,000 of these couples were to be supplied with contraceptives by their local health centres, the estimated annual cost would be Rs.48 lakhs.

(e) Inoculation and malaria eradication

1,260. Other preventive services which should be undertaken locally by health centres include vaccination programmes, particularly against smallpox and tuberculosis and malaria eradication measures.

2. Curative services

1,261. The main objective of the programme proposed for curative services is the provision of easy access, in terms of both distance and cost, to health centres and hospitals for all segments of the population. The main emphasis is on local health centres which, by providing services for the large majority of less serious complaints, will reduce the load on hospitals. The programme also provides for the construction of sufficient new hospitals to maintain the present level of hospital service, and the provision of training facilities to meet future health staff requirements.

1,262. This policy is dictated by the magnitude of future requirements. Even to maintain the existing low ratio of hospital beds to population will require construction of 10 new 300-bed hospitals by 1985. Using low-cost building methods, this will still absorb about half of the health programme budget to 1985. Significant improvements in this standard would be prohibitively expensive in this time period.
a) Health centres

1,263. It is proposed to provide health centres throughout the City at the rate of one for each 50,000 population. The centres will thus provide essentially local services and will deal only with out-patients and, at some centres, with maternity cases.

1,264. The health centre will be staffed to provide 24-hour services daily. It will also have important functions in some aspects of the preventive health programmes reviewed above, and will coordinate its activities with those of the community development centres and schools in the same locality. Each health centre should have well-established links with general and specialist hospitals and should be equipped with telephone and ambulance services.

1,265. This proposal accepts as a basic premise that the quality of care provided by the health centre is essentially dependent upon the quality of its staff and equipment, and that the standard of construction for the building is of much lower importance. Available data indicate that with the income distribution expected in 1985, a mixed-income community of 50,000 would require facilities for about 1,400 out-patients per day, and a minimum of six doctors would be needed to deal with this number if supported by sufficient other staff. On this basis a total of 92 new health centres, staffed by 554 additional doctors, would be needed by 1985.

1,266. In estimating future maternity bed requirements, a crude birth rate of 30 per thousand population has been used for 1985, recognizing that the desired reduction to 22 might not be achieved in this period. On this basis, taking into account the present availability of beds, an additional 203 beds will be required by 1985. It is proposed to provide these maternity beds in 12-bed wards attached to each of 17 local health centres. (An additional 1,080 beds for non-routine obstetrics cases and gynaecology would be provided in the proposed new hospitals.) The remaining 75 new health centres would not deal with maternity cases. Thus, each maternity ward would be part of a health centre, and laboratories, ambulances, medical staff and population planning officers (who can play very effective roles in maternity centres) can be shared as necessary.

b) Hospitals

1,267. To maintain the existing standard of 1.7 hospital beds per thousand population an additional 5,530 beds will be required by 1985. These could accommodate 62 admissions per thousand population per year if each patient remained for ten days. It is proposed that these beds be provided in 18 new 300-bed hospitals, as it has been estimated that this would be the most economic size for new hospitals in Karachi. Each such hospital would serve a population of approximately 176,000.

1,268. Each hospital should be staffed with one physician and at least eight nurses or nurse aides for every 16 beds. Eighty per cent of patients would require operations, and to handle these each hospital would have three operating
theatres and one casualty operating room. Each hospital would also have a "filter" clinic to screen out would-be patients who do not need attention or who can be treated at local health centres, so eliminating avoidable demands on hospital facilities.

1,260. It is not proposed that these new hospitals be equipped with intensive-care and therapy units because of the high costs involved. These facilities will be available in existing hospitals and the new Agha Khan Hospital. It is proposed that construction costs be kept to a minimum, by using one-storey construction and, while laboratories, X-ray units and theatres should be built to high standards, the wards should be of much cheaper barrack-type construction. These new hospitals should be built in widely-separated population centres to rectify present imbalances and poor access resulting from over-centralization.

4. Training of doctors and nurses

1,270. In 1985 a total of 900 additional doctors will be required to work in Karachi. The Dow Medical College alone now produces 200 graduate doctors per year and, even allowing for retirements and other staff losses, this supply will be more than adequate to meet Karachi's needs. The recently opened college at Jinnah Hospital and that proposed at the Agha Khan Hospital will not be required to serve Karachi's needs, but can nonetheless train doctors for service elsewhere in Pakistan. Further new colleges should not be built in Karachi.

1,271. Nursing courses are presently training about 200 nurses in 3-year courses. Thus, about 70 nurses graduate each year and all of these are absorbed by existing institutions. The proposed health programme calls for an increase in nursing staff of 3,900 by 1985, and this would call for new schools with a total capacity of just over 1,000 trainees over the period 1974-1985. The proposed 600-bed Agha Khan Hospital will provide places for 250 nurses. The remaining 800 trainees will have to be accommodated in the proposed new hospitals. Retirement of staff may add considerably to this total.

4. The geographic distribution of services

1,272. The present distribution of hospitals, dispensaries and maternity homes is far from ideal. Hospitals are heavily concentrated in or near the central area, although most of them are serving the whole of the city. Outer areas such as North Karachi, Baldia, Malir, Korangi, Landhi and others are seriously lacking hospital services and are long distances from the larger general hospitals. The geographic distribution of dispensaries and maternity homes also results in serious imbalances, and several areas are provided with many fewer facilities than they need. Most of these sub-standard areas are also predominantly low-income residential areas.

1,273. It is essential that new facilities be distributed throughout the City to rectify the deficiencies identified above and to provide adequate service levels
5. Standards and costs for health services

1,274. The requirements in terms of rooms for different purposes, their dimensions and staff requirements have been considered in some detail for the two types of health centres and for the proposed new hospitals. The plot size for a health centre with and without a maternity wing should be 2,500 and 1,500 square yards respectively.

1,275. It has been emphasised already that the quality of the service provided depends much more on staff and equipment than on the buildings which house them. Generally, buildings are proposed which, although they provide ample space, are constructed using the lowest-cost materials and building techniques suitable. The standards proposed are based on the proposals of the People's Health Scheme and on the advice of medical staff of the Jinnah Postgraduate Medical Centre and the Korangi Health Centre.

1,276. One of the most effective ways of raising the quality of staff would be to make medical careers more attractive by raising salary levels. This is an essential item of the proposed health programme.

1,277. It is estimated that single-storeyed health centres with concrete floors, could be built for PBs.19 per square foot of covered floor area, excluding land and land development costs. Double-storeyed buildings would cost nearly double this, and are not recommended. The construction costs for hospitals have been calculated using unit rates corresponding to the construction standards proposed for different parts of the hospital.

1,278. The estimated costs per health facility are shown in Table XXI.1. The operating costs are quite high relative to capital costs, reflecting the emphasis upon provision of services and the de-emphasis on physical construction standards.

<table>
<thead>
<tr>
<th>Capital costs per facility (PBs.)</th>
<th>Construction</th>
<th>Equipment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health centres without maternity wards</td>
<td>137,000</td>
<td>99,700</td>
<td>236,700</td>
</tr>
<tr>
<td>Health centres with maternity wards (12 beds)</td>
<td>252,900</td>
<td>121,800</td>
<td>374,700</td>
</tr>
<tr>
<td>Hospitals (300 beds)</td>
<td>4,462,000</td>
<td>2,220,000</td>
<td>6,682,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Recurring costs per facility (PBs. per annum)</th>
<th>Personnel</th>
<th>Medicines and contraceptives</th>
<th>Maintenance</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health centres without maternity wards</td>
<td>187,700</td>
<td>213,300</td>
<td>1,900</td>
<td>402,900</td>
</tr>
<tr>
<td>Health centres with maternity wards (12 beds)</td>
<td>245,300</td>
<td>217,700</td>
<td>2,900</td>
<td>465,900</td>
</tr>
<tr>
<td>Hospitals (300 beds)</td>
<td>1,612,200</td>
<td>800,000</td>
<td>66,700</td>
<td>2,478,900</td>
</tr>
</tbody>
</table>
Details of these cost estimates have been presented in separate reports.3

5. The costs of the programme for health

Estimates of costs have been prepared for all aspects of the proposed preventive and curative health programmes, except those concerned with water supply and waste disposal, which are dealt with in Chapter XII. In preparing these estimates, the programme has been assumed to commence in 1974 with facilities essentially the same as those available in 1971, and costs have been calculated for the 11-year period 1974 to 1985.

The resulting total costs for the programme are summarized in Table XXI.2. Total non-recurring costs over the 11-year period from 1974 are Rs. 1.4 crores, and the maximum recurring costs (at the end of the period) are Rs. 9 crores per annum. Almost all of these costs are incurred for the curative health programme, since many of the preventive functions will be carried out by the health centres, community centres and schools.

It should be noted that the recurring costs shown in Table XXI.2 will only be incurred in full when all of the proposed new facilities are in operation; they will increase from zero cost at the start of the programme to reach the full values shown only when the programme is completed.

A complete picture of annual expenditure for capital and recurring costs could be presented only after a careful exercise in budgeting with due regard to the finances likely to be available at different stages throughout the period. The figures in Table XXI.3 represent an approximation to such a budget based on the assumptions that, commencing in 1974, the capital costs will be evenly distributed over the 11-year period to 1985, that at any time the recurring costs will be proportional to the total investment up to that time, and that during any year the recurring costs will be the average of those at the start and at the end of the year. The total annual costs range between Rs. 1.3 crores in the first year of the programme and Rs. 9.6 crores in the final year. These represent only the costs of additional requirements to provide the services proposed in the programmes. Facilities and services which are now in operation will continue to incur operating expenses beyond the costs presented in Table XXI.3.

---

### Table XXI.2

**Summary of costs - proposed health development programme: 1974/1985 (Rs. crores)**

<table>
<thead>
<tr>
<th></th>
<th>Construction</th>
<th>Equipment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Non-recurring costs a/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Preventive programme b/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Curative programme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health centres without</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maternity wards</td>
<td>1.026</td>
<td>0.788</td>
<td>1.814</td>
</tr>
<tr>
<td>Health centres with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maternity wards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitals</td>
<td>8.033</td>
<td>3.950</td>
<td>12.983</td>
</tr>
<tr>
<td>Total curative programme</td>
<td>9.491</td>
<td>4.915</td>
<td>14.406</td>
</tr>
<tr>
<td>Total programme costs</td>
<td>9.491</td>
<td>4.915</td>
<td>14.406</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Recurring costs (Rs. crores per annum)</th>
<th>Medicine, contraceptives</th>
<th>Maintenance</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Preventive programme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population planning</td>
<td></td>
<td>-</td>
<td>0.480</td>
</tr>
<tr>
<td>Total preventive programme</td>
<td></td>
<td></td>
<td>0.480</td>
</tr>
<tr>
<td>b) Curative programme</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health centres without</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maternity wards</td>
<td>1.408</td>
<td>1.600</td>
<td>0.014</td>
</tr>
<tr>
<td>Health centres with</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maternity wards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospitals</td>
<td>2.902</td>
<td>1.440</td>
<td>0.128</td>
</tr>
<tr>
<td>Total curative programme</td>
<td>4.727</td>
<td>3.410</td>
<td>0.139</td>
</tr>
<tr>
<td>Total programme costs</td>
<td>4.727</td>
<td>3.890</td>
<td>0.139</td>
</tr>
</tbody>
</table>

a/ Excluding costs of land and land development.
b/ For community development and public television see Chapters XX and XXII.
c/ Maximum recurring costs at programme completion.

### Table XXI.3

**Annual costs of the health development programme (Rs. crores)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Capital Costs a/</th>
<th>Operating Costs b/</th>
<th>Total Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974/1975</td>
<td>1.310</td>
<td>0.398</td>
<td>1.708</td>
</tr>
<tr>
<td>1975/1976</td>
<td>1.310</td>
<td>1.194</td>
<td>2.504</td>
</tr>
<tr>
<td>1976/1977</td>
<td>1.310</td>
<td>1.990</td>
<td>3.300</td>
</tr>
<tr>
<td>1977/1978</td>
<td>1.310</td>
<td>2.286</td>
<td>3.596</td>
</tr>
<tr>
<td>1978/1979</td>
<td>1.310</td>
<td>3.592</td>
<td>4.904</td>
</tr>
<tr>
<td>1979/1980</td>
<td>1.310</td>
<td>4.379</td>
<td>5.698</td>
</tr>
<tr>
<td>1981/1982</td>
<td>1.310</td>
<td>5.970</td>
<td>7.280</td>
</tr>
<tr>
<td>1983/1984</td>
<td>1.310</td>
<td>7.562</td>
<td>8.872</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>14.406</strong></td>
<td><strong>48.158</strong></td>
<td><strong>62.564</strong></td>
</tr>
</tbody>
</table>

a/ Includes all construction and equipment costs.
b/ Includes all personnel, medicine and maintenance costs.
C. IMMEDIATE ACTION

1,284. Health planning, as such, lies outside the scope of the Karachi Planning Project. The Project's role is primarily a supportive one, helping to identify the magnitude of the health problems likely to be encountered in the Region in the foreseeable future, and assisting the agencies responsible for action in their health planning. The following recommendations for action include several items in which the Development Plan staff can play a role directly. Other items in the list are in the nature of suggestions presented for the consideration of the agencies responsible for action in these areas.

1. Creation of a Metropolitan Health Policy Group

1,285. This might be an inter-agency committee responsible for framing health policy for the Metropolitan Region and undertaking Metropolitan health planning to coordinate the activities of the various entities responsible for the delivery of health services. This health policy group presumably would have representatives from the Federal, Provincial and Local level and would maintain a technical staff group to assist in formulating policies and plans. It might also be responsible for the maintenance of centralized data on health conditions and services in the area. It should formalize an explicit health policy along the lines recommended in this report.

2. Higher Priority for Health in the Federal, Provincial and Local Budgets

1,286. Unless there is a substantial change in the distribution of financial resources, with a larger allocation for health, even the minimum development programme recommended for the Metropolitan Region in the present report will have no chance of materializing. Annual Plans and Annual Development Programmes have been unbalanced in the past, with a low priority given to human resource development and social services.

3. Designation of Priority Areas for the Improvement of Health Services

1,287. The health policy group, with the assistance of the Master Plan Department, should immediately identify the existing areas in the Metropolitan Region where health service deficits are most severe and develop immediate-action programmes for rectifying those deficits, with the type of programme recommended depending upon the specific nature of the deficits.

4. Participation in the Metroville Programme

1,288. A large-scale experiment with the type of health programme recommended here should be launched in conjunction with the Metroville Programme. This programme should incorporate environmental sanitation, the development of health centres of the type recommended, with one centre for
each 50,000 persons, mobile health units, health education in collaboration with the schools in the area, and the use of mass media for widespread health service promotion. The programme should incorporate experimentation with improvements in food quality control. It should also include experimentation with materials and construction techniques for the building of health centres.

5. Immediate use of mass media for health promotion

1,289. Experimentation should begin immediately with the use of mass media for the area-wide promotion of health services. Contacts have already been made with the Pakistan Television Corporation (PTC) and PTC has evinced keen interest in the use of television for purposes such as this. UNICEF in Pakistan has expressed interest in the possibility of experimental education programmes which might be integrated with the promotion programme.

6. Establishment of a Metropolitan health data system

1,290. A beginning should be made immediately to coordinate the activities of the various entities that maintain health data in the Karachi Urban Area. Decisions should be made as to which data are essential and can be maintained with existing resources.
CHAPTER XXII

SOCIAL WELFARE SERVICES

A. THE PROGRAMME FOR 1974-1985

1.291. Community participation in development is an important part of several of the programmes being recommended in the Karachi Planning Project. It is proposed that local communities be encouraged to participate in the development of their own facilities as fully as possible. Among the activities suited to community participation are the construction of health centres, schools and community centres, garbage collection, construction of drains, establishing adult training and skill-improvement courses, literacy courses, organization of co-operatives to assist home builders, farmers and shopkeepers, and training in house building techniques. Some of these programmes would require assistance from outside firms and some would have to be co-ordinated with local authorities, but it is possible to use community resources, both skilled and unskilled, to achieve development more quickly and at lower cost than by conventional processes.

1.292. Some or all of the informal education courses proposed, which should include family planning, nutritional hygiene and mother and child care, would be provided in local health centres. For other aspects of the programme a local community centre should be available with a small staff.

1.293. It is proposed that the programme be introduced through the Metroville Programme and that one community development centre be established for every 50,000 people in the household income range below P80,000 per month. In mixed income areas in 1985 three centres would be needed for every five communities of 50,000 people. In total, 78 centres would be required by 1985. Each centre should be built with office space, discussion rooms, classrooms and recreation rooms, and have its public television set in an open courtyard. Staff and land requirements are summarized below.
Table XXII.1
Community centre requirements in 1985

<table>
<thead>
<tr>
<th>Population served:</th>
<th>3,900,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of centres required:</td>
<td>78</td>
</tr>
<tr>
<td>Social workers required:</td>
<td>312</td>
</tr>
<tr>
<td>Total staff required:</td>
<td>1,404</td>
</tr>
<tr>
<td>Land required (acres):</td>
<td>39+</td>
</tr>
</tbody>
</table>

1.294. The space standards, equipment, materials and staffing suggested for community centres and detailed cost estimates are presented in other Project documents. A summary is presented in Table XXII.2.

Table XXII.2
Cost summary — community centre (Pakistan rupees)

<table>
<thead>
<tr>
<th>Capital Costs</th>
<th>Construction</th>
<th>Equipment</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>360,200</td>
<td>59,800</td>
<td>420,000</td>
</tr>
<tr>
<td>Operating Costs</td>
<td>220,900</td>
<td>29,100</td>
<td>250,000</td>
</tr>
</tbody>
</table>

1.295. The total proposed expenditures are presented in Table XXII.3.

Table XXII.3
Proposed expenditures for community centres 1974-1985 (PRs. crores)

<table>
<thead>
<tr>
<th>Year</th>
<th>Capital Costs</th>
<th>Operating Costs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974/1975</td>
<td>.298</td>
<td>.177</td>
<td>.475</td>
</tr>
<tr>
<td>1975/1976</td>
<td>.298</td>
<td>.355</td>
<td>.653</td>
</tr>
<tr>
<td>1976/1977</td>
<td>.298</td>
<td>.532</td>
<td>.830</td>
</tr>
<tr>
<td>1977/1978</td>
<td>.298</td>
<td>.709</td>
<td>1.007</td>
</tr>
<tr>
<td>1978/1979</td>
<td>.298</td>
<td>.886</td>
<td>1.184</td>
</tr>
<tr>
<td>1979/1980</td>
<td>.298</td>
<td>1.064</td>
<td>1.362</td>
</tr>
<tr>
<td>1980/1981</td>
<td>.298</td>
<td>1.241</td>
<td>1.539</td>
</tr>
<tr>
<td>1981/1982</td>
<td>.298</td>
<td>1.418</td>
<td>1.716</td>
</tr>
<tr>
<td>1982/1983</td>
<td>.298</td>
<td>1.595</td>
<td>1.893</td>
</tr>
<tr>
<td>1983/1984</td>
<td>.298</td>
<td>1.773</td>
<td>2.071</td>
</tr>
<tr>
<td>1984/1985</td>
<td>.296</td>
<td>1.950</td>
<td>2.246</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3.276</td>
<td>11.700</td>
<td>14.976</td>
</tr>
</tbody>
</table>

1. Participation in the Metroville Programme

It is important that action be undertaken as soon as possible to test the feasibility of the proposed programme and to develop further the initial concepts and ideas. One community centre is proposed in the first Metroville. The Directorate of Social Welfare should use this project as a testing place for new ideas and concepts. If the programme is successful, it can be continued and expanded in future Metrovilles and in other areas where social welfare services are inadequate.
THE METROVILLE PROGRAMME

A. TRENDS AND CONDITIONS

1,297. Karachi is expected to grow to 6.9 million people by 1985 and close to 12.5 million by the year 2000. This growth comes upon a city with enormous existing deficits in housing stock, water supply, sanitation, drainage, health and education services. It is clear that the existing administrative and fiscal practices affecting urban growth can not keep pace with the minimum requirements. Karachi is a city on the threshold of urban crisis. There is a need for a bold, imaginative new approach to the building of urban structure, delivery of essential services, generation of employment opportunities and the assurance that these benefits will be made available to low-income people.

1,298. The Development Plan for Karachi addresses these points with many specific recommendations for programmes and projects, but the recommendations of the Development Plan are so comprehensive that there is a danger that the required momentum will not be generated unless a specific focus is identified by which to pull the various programmes together. The Metroville Programme is in response to this need.

1,299. The term "Metroville" was chosen to parallel its rural equivalent the "Agroville". The term implies the integrated development of viable urban communities covering their physical, social, economic, financial and administrative requirements.

1,300. The persons for whom the Metroville Programme will be undertaken will not primarily be the new urban migrants. New migrants, often single men, will locate in the centremost city jhuggi areas. They are looking primarily for work and are not yet concerned about the ownership and building of a permanent urban home.

1,301. The people to be attracted to the Metroville Programme are families which already have a job, a craft or business. This group is looking for secure land tenure and a chance to improve their standard of living. They will still be among the low-income groups, for the most part, but above the lowest-income levels.
1,302. The key to the success of the Metroville Programme will be its ability to attract people to purchase plots and live in the projects. This will require that the combination of reasonable prices for plots, the credit arrangements available, the public facilities, and the related social and economic programmes are sufficiently attractive that people will prefer the Metrovilles to living in unauthorized areas or the improved and regularized jhuggi areas. This is a significant difference between the Metroville concept and the previous open plot programmes where families were forced to relocate when their homes were destroyed in a jhuggi clearance project.

1,303. The population of each Metroville would be determined by the level of population and income necessary to support a viable commercial centre, adequate education and health facilities, and adequate public transportation. Approximately 10,000 residential plots appear to be an ideal size for a Metroville project. This would typically generate:

<table>
<thead>
<tr>
<th>Item</th>
<th>Number of persons served</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>57,500</td>
</tr>
<tr>
<td>Labour force</td>
<td>10,600</td>
</tr>
<tr>
<td>Employment desired on site</td>
<td>7,700</td>
</tr>
<tr>
<td>Primary school children</td>
<td>7,200</td>
</tr>
<tr>
<td>Secondary school children</td>
<td>4,000</td>
</tr>
</tbody>
</table>

1,304. The Metroville Programme is to start with the first Metroville Project in 1974, but four Metroville Projects must be completed every year before the total need can be met. It is essential, therefore, that the first Metroville Project be considered as a part of a total development programme.

B. OBJECTIVES

1,305. The objectives of the Metroville Programme are the following:

(a) To provide urban growth modules of 50,000 or more persons on a scale sufficient to meet the new growth demands in Karachi until 1985.

(b) To provide for 40 per cent of the resident labour force employment opportunities within or near Metroville sites.

(c) To provide the minimum levels of health, education, and community development services as recommended in the Development Plan.

(d) To provide treated water supply on a financially self-sustaining basis by metering community water points and insuring that acceptable minimum sanitation is provided.

(e) To demonstrate that minimum public services can be provided to include regular refuse collection, street maintenance, ditch cleaning, police and fire protection on a self-sustaining basis from property taxes collected.
(f) To ensure that sufficient bus transportation is provided at convenient points near the sites.

(g) To provide adequate levels of financial assistance at terms and conditions related to the ability to pay, but without direct subsidy.

(h) To foster a sense of community pride, self-sufficiency and self-help.

(i) To ensure that the necessary administrative structure is in place to make the overall programme on-going and to ensure the initial and continued co-operation among the government agencies responsible for various programme components.

C. THE PROGRAMME RECOMMENDED

1.306. The ability to carry out physical development, housing in particular, already exists in Karachi. The building of houses has been seen, however, as an end in itself and not as a part of a process aimed at creating integrated viable communities. The Metroville Programme will bring together the policies, programmes, and recommendations of the Development Plan and demonstrate their practical application.

1. Administrative Organization

1.307. The Metroville Programme will require the combined support and co-ordination of a variety of government agencies. As a minimum the following agencies will need to actively participate:

Karachi Development Authority
Karachi Municipal Corporation
Sind Small Industries and Handicrafts Development Corporation
House Building Finance Corporation
Provincial Departments of Education and Health
Provincial agencies participating in the People's Works Programme.

The responsibility for obtaining the required co-ordination should rest with the interim Metropolitan Planning and Development Committee.

1.308. There will also need to be a full-time professional planning staff to ensure a steady production of Metroville Projects. This unit has already been recommended by KDA. The professional staff should be multi-disciplinary combining architects, engineers, surveyors, sociologists, urban planners, economists and finance specialists. They should be solely responsible for the Metroville Project preparation.

1.309. Another group within KDA should be responsible for the physical construction of the Metroville Projects. KDA has ample capability and experience for this function.
1,310. For each Metroville Project there should be an inter-agency administrative field team established on site. The purpose of this team would be to facilitate the social and economic take-off of the community. KDA and HBFC should be organized so that a potential purchaser in a Metroville Project need only visit the site office in order to arrange all aspects of his long-term lease and housing finance. At present KDA plot allocations involve more than a dozen separate steps, each involving the shifting of a file from one office to another. This process, which can take months and involve large amounts of the individual's time, must be avoided. The entire transaction with a bonafide applicant should be done in one office on the site and involve no more than two or three visits and at most one week of time. This is essential if the continuous Metroville Programme is to operate at its target scale of 40,000 plots per year.

1,311. The HBFC must also be geared to providing efficient on-site review and approval of loan applications. HBFC has already made major improvements in its loan processing operations and should be able to meet these objectives.

1,312. Also working out of the same site office should be a representative of the Sind Small Industries and Handicrafts Development Corporation who is fully capable of providing the full range of support planned. The agency eventually given responsibility for the community development programme should also be present with its field staff to support the social programming. The concept is to have decentralized project management to provide maximum convenience for the prospective resident.

1,313. The Metroville Programme will require an active marketing campaign in order to attract households to come and live on the site. No families should be forced to relocate to the site. All should come voluntarily. This will require establishing an advertising campaign reaching out into the jhuggies and low-income settlement areas to "sell" the concept of the Metroville.

1,314. A specific strategy will be required to do this. It should be given careful preparation because it will in part determine the success of the overall programme.

2. The physical structure concept

1,315. The fundamental objective in Metroville development is the adoption of housing and building solutions that provide adequate services and a flexible community layout while enabling the family to build incrementally using self-help techniques.

1,316. The solution proposed for the Metroville Programme is to provide a range of housing types including open plot development on 80 square yard plots with community water and sewerage and utility wall development with water, sewerage and possibly gas attached to a plinth and concrete block wall in addition to ordinary high standard development with full utilities. The family would be encouraged to add to the plot as their finances permit and as the family grows.
1.317. Assistance would be provided in building construction techniques, and the Government could contract for and sell items such as door and window frames, compound wall gates, concrete blocks, roof slabs, and plumbing and drainage materials.

1.318. Most of such housing would range from one to three storeys. It will be possible to achieve adequately high densities to enable the long-term expansion of the Metropolitan Area without high transportation and infrastructure costs. At important central points and in commercial areas, multi-storeyed buildings are desirable. Apartments and town houses can be judiciously located in open plot development in Metrovilles.

1.319. The layout concept is based upon the creation of corridors of high-density demand supporting local manufacturing and service activities and served by public transport.

1.320. Commerce would take the form of a "high street", a continuous shopping street with shops on both sides of the street, stretching for half a mile or more, and built largely for pedestrians. Each high street centre would be within walking distance of a population of 50,000 and within bicycling or rickshaw distance of a much larger population. The major centres would be supported by 5-10 minor centres for food and every day needs. Hawkers and vendors would distribute goods and services from both types of centres.

1.321. Small-scale manufacturing would be expected to locate in commercial complexes and in scattered locations throughout the community. A small industrial estate would be established on the perimeter of the Metroville.

1.322. In each Metroville there would be primary schools, secondary schools, health centres and a community centre.

1.323. The role of streets is very important. Plots will be small and many household activities have to be performed outside the house. Activities will overflow onto the street, making the street an extension of the house. Social gatherings, weddings, play and other household functions can occur in the streets. On the other hand, care must be taken not to make the roads too wide, which may tempt families to construct extensions to houses and to encroach on the road right-of-way.

3. House construction

1.324. Construction materials would include soil cement blocks, asbestos and tin sheeting and other semi-pucca materials, as well as concrete block and reinforced concrete.

1.325. It is proposed that the public sector enter the building material market by financing the manufacture of concrete blocks, concrete lintel joints, floor joints, roof slabs and plumbing and drainage materials. Once manufactured by small manufacturers these would be stockpiled by Government and provided to small construction companies and families wishing to construct their own housing.

1.326. Much of the construction could be done by the community itself on a self-help basis. Local communities would be encouraged to participate in the development of their own facilities such as the construction of housing, health centres, schools, community centres and recreation facilities.
1,327. The Housing Research Station should be invited to organize various practical experiments with building materials in the Metroville projects. It is particularly important that the Utility Wall Programme be subjected to controlled testing both as to its structural potential and consumer reaction. Private construction firms should also be invited to undertake construction and marketing research within the projects.

1,328. Technical assistance for self-help housing construction should be provided through the community development programme.

## 4. Small-scale and household industry programmes

1,329. For some time to come the number of people in the active labour force will outstrip the supply of jobs. The shortage of jobs will be particularly severe in the newly developing areas of Karachi such as the Metroville unless small firms are encouraged to locate there.

1,330. Small firms in Karachi face a number of problems. As a result of lack of opportunity for expansion, there is an oversupply of capacity relative to demand in some product lines. Only a few small firms are able to obtain loans from commercial banks. They may be unable to obtain raw materials. It is sometimes difficult to obtain skilled labour. Although the technicians are often very skilled in developing production techniques, they experience problems in maintaining quality control and often are unaware of better production techniques. There is a need for improved engineering design. Marketing is often difficult. Small firms may be unable to obtain a suitable location in close proximity to their markets and labour, and with adequate land, facilities and services.

1,331. Small firms in Karachi require less capital than large firms and generate more employment. Their propensity to save out of output is judged to be no lower than that of large firms, and they aid in the mobilization of savings by providing investment opportunities largely outside the modern banking system. Most importantly, small firms constitute a testing ground for new products and processes needed for the growth and development of the Pakistan economy and a path of upward mobility for their owners.

1,332. For these reasons, support programmes for small transportation, construction and manufacturing firms must be improved and expanded, and it is proposed that this be done in conjunction with the Metroville project — a project in a very good location with respect to the Sind Industrial Trading Estate and other major metropolitan markets.

1,333. The support programmes proposed for small firms are described in more detail in Chapter X. They include loans for small manufacturers, construction companies, transportation firms and businessmen, equipment and financing for household units, technical assistance, technical training and a supply and marketing depot.
1.334. The Sind Small Industries and Handicrafts Development Corporation should be responsible for co-ordination of the overall programme and technical assistance and the supply and marketing depot. Commercial banks should be asked to provide financing under the Small Loans Scheme of the State Bank of Pakistan and groups such as the University, the Institute of Business Administration, the Machine Tool Factory, the Chamber of Commerce and Industry and the armed forces should provide technical training.

1.335. The number of firms in the first Metroville would not justify the establishment of a training centre there, but offices should be established in the administrative centre for the employees of the Corporation. A small loan cell should also be established in the administrative centre to facilitate financing.

5. The social programme

1.336. The Metroville Programme should be used as an initial demonstration of the education and health programmes described in Chapters XX and XXI. Facilities to be located on the site should include primary schools, secondary schools and a health centre with maternity ward. Agreement should be reached with the appropriate agencies to support the Metroville Programme as a priority.

1.337. An urban community development programme should be introduced to include instruction in health and hygiene, diet, budgeting, family planning, and mother/child care. The community development programme staff would manage public television screenings, organize discussion periods, establish and direct skill-improvement courses (sewing, leatherwork, embroidery and budgeting for women, and building techniques for men), organize co-operatives, function as local employment officers and organize youth recreation programmes. A community centre would be established for each Metroville, and it would be equipped with a public television set in an open courtyard.

1.338. The community development programme should actively support the voluntary organizations which are formed within the Metroville Projects. The community development programme should minimize government staffing and control and maximize the local contributions of the residents.

II. IMMEDIATE ACTION

1.339. The first Metroville Project should be undertaken during 1974.

1. Site selection

1.340. Various sites were examined for the first Metroville Project. The site selected was in the Aurangi area and is near the Sind Industrial Trading Estate (S.I.T.E.). The site chosen is an extremely good one: it is close to major employment centres in S.I.T.E., the central area and Liaquatabad, Nazimabad and Goliyar. It is a location where small firms can easily procure materials and sell their products. The central market will serve not only the population of the Metroville but also that of the surrounding areas. The area
can be linked easily to the adjacent communities of Aurangi and Baldia. As a result of its excellent location the Metroville project should develop rapidly and command high enough land prices to make the project self-financing. The land is in government or quasi-government ownership. The required off-site trunk infrastructure can be made available in the 1975-1980 programme.

1,341. The site chosen consists of an area of 326.5 acres divided into two parts by a steep ridge running east/west. The northern part, 129.2 acres, is partially occupied by a spontaneous settlement of 500 houses; the southern part, 206.3 acres, is free of development. Another ridge forms the southern boundary and separates the Metroville site from the Sind Industrial Trading Estate. A gap or pass in this ridge links the site to the trading estate and subsequently to the centre of Karachi. The gap forms part of a route leading to Aurangi and Baldia and along with a similar gap represents the only access to an area of 1,000 acres, all potentially developable. The 1,000-acre area is only developed to about 10 per cent of its capacity. A large number of people pass through the gap daily from Baldia and Aurangi.

2. The physical layout

1,342. The site has been divided into nine neighbourhood units, each 30 acres, each served by a primary school capable of accommodating 200 children on a two-shift basis. The boundaries of each area have been chosen to encompass a portion of land of uniform slope. In addition to a primary school, each area contains a plaza, a bus stop, a firewood storage area and a small open market. A secondary school serves two neighbourhood units and the following facilities are planned to serve all the nine neighbourhoods:

- A central market.
- A health centre with a maternity ward wing.
- A social centre.
- A site administrative unit, with offices for plot allocation, house loans, industrial credit and community welfare. This should provide for "one-stop" institutional shopping.
- A small industrial estate of six acres.

The three neighbourhood units located in the northern, partially encumbered part of the site, will require a detailed survey prior to designing the street plan. It is very desirable to integrate the existing settlements into the new neighbourhoods.

1,343. A detailed plan has been prepared for the unencumbered portion of the site. The street network has been designed to meet the following requirements:

(a) Streets should have a slope of not less than 1 per cent or more than 4 per cent;

(b) the existing pedestrian tracts should be regarded as potential opportunities for the creation of high streets;
(c) the street network should reinforce the focal points of the plan, e.g., plazas, high street markets, by providing privileged accessibility to those focal points.

(d) the street pattern should discourage through traffic;

(e) commercial areas are proposed on a linear pattern (high street). Vehicular parking and service access is provided on the streets lying parallel to the high streets, but these streets are designed to present a discontinuous pattern, to avoid through traffic;

(f) circulation for buses with stops deliberately chosen to serve the focal points.

1,344. The land uses for which the Project has been prepared are shown in the map First Metroville Project: Major Land Use and Table XXIII.1, First Metroville project: land use.

Table XXIII.1
First Metroville project: land use

<table>
<thead>
<tr>
<th>Land use type</th>
<th>Acres</th>
<th>Per cent of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>114.5</td>
<td>56.6</td>
</tr>
<tr>
<td>Commercial</td>
<td>5.1</td>
<td>2.5</td>
</tr>
<tr>
<td>Industrial</td>
<td>7.2</td>
<td>3.6</td>
</tr>
<tr>
<td>Parks</td>
<td>1.9</td>
<td>0.9</td>
</tr>
<tr>
<td>Institutional</td>
<td>13.0</td>
<td>6.4</td>
</tr>
<tr>
<td>Street and plaza areas</td>
<td>54.2</td>
<td>26.8</td>
</tr>
<tr>
<td>Other</td>
<td>6.3</td>
<td>3.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>202.2</td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

1,345. Five acres at the southern end of the site have been left as open space because of the roughness of the terrain.

3. Mix and balance of income groups

1,346. The desirability of mixing income groups in residential areas has been established in the Development Plan and an effort has been made to respond to this need in the design of the Metroville Project. The income groups to be located in the Metroville were established by an analysis of the overall housing market in the vicinity. They are presented in Table XXIII.2, First Metroville project: population and household income groups.
Table XXIII.2
First Metroville project: population and household income groups

<table>
<thead>
<tr>
<th>Income group (FRS. per month)</th>
<th>Number of households</th>
<th>Population</th>
<th>Per cent of households</th>
<th>Per cent of population</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-299</td>
<td>1,174</td>
<td>5,295</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>300-499</td>
<td>2,994</td>
<td>18,982</td>
<td>51</td>
<td>31</td>
</tr>
<tr>
<td>500-999</td>
<td>1,468</td>
<td>10,849</td>
<td>25</td>
<td>19</td>
</tr>
<tr>
<td>1,000-1,999</td>
<td>176</td>
<td>1,699</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>2,000 and more</td>
<td>59</td>
<td>468</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>5,871</td>
<td>37,293</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

4. Housing

1,347. Except for the utility wall plots, housing will be the responsibility of the individual plot owners. The expected distribution of housing types is shown in Table XXIII:3, First Metroville project: housing types.

Table XXIII:3
First Metroville project: housing types

<table>
<thead>
<tr>
<th>Housing type</th>
<th>Plot size or land requirement</th>
<th>Number of units</th>
<th>Acres</th>
<th>Per cent of units</th>
<th>Per cent of residential area</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPD</td>
<td>80</td>
<td>2,500</td>
<td>41.3</td>
<td>42.6</td>
<td>36.1</td>
</tr>
<tr>
<td>OPD</td>
<td>120</td>
<td>100</td>
<td>2.5</td>
<td>1.7</td>
<td>2.1</td>
</tr>
<tr>
<td>UWD</td>
<td>80</td>
<td>1,546</td>
<td>25.6</td>
<td>26.3</td>
<td>22.4</td>
</tr>
<tr>
<td>UWD</td>
<td>120</td>
<td>994</td>
<td>24.6</td>
<td>16.9</td>
<td>21.5</td>
</tr>
<tr>
<td>Flats</td>
<td>20</td>
<td>296</td>
<td>1.2</td>
<td>5.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Townhouses</td>
<td>120</td>
<td>168</td>
<td>4.2</td>
<td>2.9</td>
<td>3.7</td>
</tr>
<tr>
<td>Bungalows</td>
<td>240</td>
<td>210</td>
<td>10.4</td>
<td>3.6</td>
<td>9.1</td>
</tr>
<tr>
<td>Bungalows</td>
<td>400</td>
<td>57</td>
<td>4.7</td>
<td>1.0</td>
<td>4.1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>5,871</td>
<td>114.9</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

1,348. Housing locations are shown on the map The First Metroville Project: Major Land Use.

1,349. The highest-income plots (bungalows and flats) have been located close to the major traffic route. This location has been chosen for the following reasons.
(a) High-income households generate most vehicular traffic.
(b) Direct access to a traffic route should facilitate the sale of the more expensive plots.
(c) The highest-income units will also have the highest standard of utilities. By locating them along the main highway which follows the nullah, the cost of utilities will be minimized. The incremental spread of utilities to low-income households will also be facilitated.

1.350. A social mix will be achieved because each unit contains a cross section of incomes. Social mixing will take place in the public facilities and in shops.

5. Economic activities and employment

1.351. The Metroville is an excellent location for economic activities. Many small firms in the Metroville will be owned by the middle-income residents of the Metroville, but some will be owned by residents of other parts of the City. Many households will be engaged in manufacturing within the home.

1.352. The types of manufacturing firms that can be expected to locate within the Metroville include sweetshops, milk shops, flour mills, tailors, upholsterers, handloom textiles, embroidery, block-printing, dyeing, sawmills, furniture-making, cardboard and paper products, footwear and other leather goods, plastic gloves, blockmaking, onyx products, automotive, motorcycle and bicycle repair, kitchen utensils, metal products, fabrication and jewelry-making. It is expected that a number of firms selling their products in other areas but with fairly minimal locational requirements can be located in the Metroville due to the supply of labour there and the nearness of the Sind Industrial Trading Estate and other markets.

1.353. The Metroville is expected to support a number of neighbourhood commercial centres and a central market. The latter will be quite small initially, but it will eventually expand into a good-sized market. The types of firms that can be expected to locate in the central market include sweetshops, tailoring, textiles, block-printing, dyeing, furniture making, shoe making and repair, vehicle repairing, foods, cloth, clothing and shoes, furniture, utensils, household goods, kerosene stoves and trunks, stationary stores, tea-shops and a post office.

1.354. The multiple use of property for shops and living should be encouraged. A workshop by day can become a bedroom at night. This approach lowers the capital costs of attempting to maintain separate residence and working facilities, reduces the cost of transport to the individual and the demand on the system, and reduces the wastage of non-hours traveling thereby freeing them for productive work.

1.355. Small plots of land have been provided for allotment to small entrepreneurs. These plots are situated close to the roads, transport facilities and commercial centres in the township. The necessary physical and social infrastructure will be developed as proposed in the overall programme.
1,356. A plot of six acres of land is to be earmarked exclusively for the establishment of small industries. At least 36 small industrial units could be established there. Infrastructure will be developed on the Estate to facilitate establishment and operation of industrial units. Plots will be sold to both the residents of the township and others. Support services will be provided by the Sind Small Industries and Handicrafts Development Corporation in order to make the site as attractive a location as possible.

1,357. The employment expected to be generated in the Metroville is shown in Table XXIII.4, First Metroville project: employment. The total employment in the Metroville could be as high as 5,010 including 1,410 in large-scale and small-scale manufacturing.

### Table XXIII.4

<table>
<thead>
<tr>
<th>Economic activity types</th>
<th>Employment</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>50³</td>
<td>1</td>
</tr>
<tr>
<td>Large-scale manufacturing</td>
<td>150</td>
<td>3</td>
</tr>
<tr>
<td>Small-scale manufacturing</td>
<td>1,260</td>
<td>25</td>
</tr>
<tr>
<td>Construction</td>
<td>740</td>
<td>15</td>
</tr>
<tr>
<td>Public utilities</td>
<td>170</td>
<td>3</td>
</tr>
<tr>
<td>Trade and finance</td>
<td>860</td>
<td>17</td>
</tr>
<tr>
<td>Transportation</td>
<td>190</td>
<td>4</td>
</tr>
<tr>
<td>Services</td>
<td>1,590</td>
<td>32</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>5,010</td>
<td>100</td>
</tr>
</tbody>
</table>

³/ Provisional amount included for forecasting purposes only.

1,358. This would provide employment for approximately 42 per cent of the labour force, as shown in Table XXIII.5, First Metroville project: employment and labour force.

### Table XXIII.5

<table>
<thead>
<tr>
<th>First Metroville project: employment and labour force</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
</tr>
<tr>
<td>Labour force</td>
</tr>
<tr>
<td>Employment</td>
</tr>
</tbody>
</table>

Per cent of labour force 42

6. Off-site trunk infrastructure

1,359. The provision of trunk services to the site will present a problem, both of timing and financing. An adequate water supply and sewerage service will not be available prior to the
later part of 1975 though it may be possible to make temporary arrangements to cover a few months. The first units are not likely to be available for occupation prior to early 1975, so the problem should be manageable. The financing of trunk services should be met from the budgets of the institutions concerned.

1. Pricing and project revenues

1,360. The prices proposed for the Metroville are high enough to ensure that they will be purchased by the households which value them most. This should reduce land speculation to a minimum and ensure the most efficient use of the land.

1,361. The prices proposed for the Metroville range from Rs.12.0 per square yard for an 80 square yard OFD plot to Rs.36.0 per square yard for a 240 or 400 square yard bungalow plot. These reflect both the overall demand for plots of each size and the location of the plots within the Metroville. The prices proposed should neither make it difficult for low-income groups to locate within the Metroville nor discourage middle-income and high-income groups from locating there. They are comparable to prices in the surrounding areas, even though services and the overall environment will be better in the Metroville.

1,362. These are suggested as initial prices. If the development is successful and there is a high demand for plots in the Metroville it is possible that higher prices could be realized, particularly for the larger plots.

1,363. It is proposed that plots be made available at no cost to education and health agencies. These are substantial land users. This represents a fairly large loss in potential revenues to KDA, and a subsidy of these programmes should be kept in mind in reviewing the overall project revenues.

1,364. The total revenues expected from the project are Rs.163.40 lakhs, including Rs.139.69 lakhs from residential development, Rs.18.04 lakhs from commercial development and Rs.5.67 lakhs from industrial development. It may be possible to increase revenues from commercial development considerably if the proposed main market is economically viable and develops rapidly.

1,365. The breakdown of prices and revenues is shown in Table XXIII.6, First Metroville project: price proposals and project revenue estimates.
<table>
<thead>
<tr>
<th>Land use and housing type</th>
<th>Plot size or land req'd. (sq.yds.)</th>
<th>Location</th>
<th>Number of units</th>
<th>Sq.yds.</th>
<th>Land Price per sq.yd. (PRs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Subtotal (PRs. Lacs)</td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Utility core Price per unit (PRs.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Subtotal (PRs. Lacs)</td>
</tr>
<tr>
<td>OPD</td>
<td>80</td>
<td>Key locations</td>
<td>125</td>
<td>10,000</td>
<td>12.0</td>
</tr>
<tr>
<td>OPD</td>
<td>120</td>
<td>Key locations</td>
<td>95</td>
<td>11,400</td>
<td>12.0</td>
</tr>
<tr>
<td>UMD</td>
<td>80</td>
<td>Key locations</td>
<td>1,469</td>
<td>117,520</td>
<td>16.0</td>
</tr>
<tr>
<td>UMD</td>
<td>120</td>
<td>Key locations</td>
<td>944</td>
<td>133,280</td>
<td>24.0</td>
</tr>
<tr>
<td>Plata</td>
<td>20</td>
<td>Key locations</td>
<td>50</td>
<td>6,000</td>
<td>28.8</td>
</tr>
<tr>
<td>Townhouses</td>
<td>120</td>
<td>168</td>
<td>168</td>
<td>20,160</td>
<td>32.0</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td></td>
<td>5,604</td>
<td>481,040</td>
<td>82.94</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td></td>
<td>267</td>
<td>73,200</td>
<td>26.15</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td></td>
<td>5,871</td>
<td>554,240</td>
<td>109.29</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13.73</td>
</tr>
<tr>
<td>Township centre</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11.73</td>
</tr>
<tr>
<td>Other centres</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.31</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.04</td>
</tr>
<tr>
<td>Industrial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.73</td>
</tr>
<tr>
<td>Large-scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.73</td>
</tr>
<tr>
<td>Small-scale</td>
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<td>5.67</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
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<td></td>
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<td>163.40</td>
</tr>
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<td>Total</td>
<td></td>
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<td>30.40</td>
</tr>
</tbody>
</table>

Note: The table provides a breakdown of land and utility costs for different housing types and locations, with subtotals and grand totals for each category.
1.366. The construction costs and project cash flow are presented in Table XXIII.7, First Metroville project: construction cost estimates and project cash flow. The total construction costs are Rs.152.10 lakhs, with the major items being water, sewerage, street lighting, roads and utility cores. It is assumed that all of the outlay for construction will be made in 1975 and that plots and utility core units will be sold over the five-year period 1975-1979. It is likely that K.D. will have to secure construction financing for a period of two to three years to maintain sufficient cash reserves to sustain an on-going programme. The net cash surplus for the project after five years will be Rs.11.26 lakhs. This will be reduced by possible defaults but it should be kept in mind that plots are being provided at no cost to education and health agencies which constitute an effective cash subsidy to them. It is likely that higher prices can be charged for residential plots and utility core units, but the proposed prices are kept intentionally low pending construction of the first units and their testing and sale on the market.

Table XXIII.7
First Metroville project: construction cost estimates and project cash flow
(Rs. lakhs, 1973/1974 prices)

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<td>Earthworks</td>
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<td>Water</td>
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<td>Sewerage</td>
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<tr>
<td>Street lighting</td>
<td>15.00</td>
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<tr>
<td>Roads</td>
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<td>22.00</td>
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<tr>
<td>Gravel roads</td>
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<td>Gas</td>
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<td>Utility cores</td>
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<td>Revenues</td>
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<td>40.85</td>
<td>40.85</td>
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<td>20.42</td>
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<td>Yearly cash surplus</td>
<td>-131.67</td>
<td>+40.85</td>
<td>+40.85</td>
<td>+40.85</td>
<td>+20.42</td>
<td>+41.01</td>
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<tr>
<td>Cumulative cash surplus</td>
<td>-131.67</td>
<td>-90.82</td>
<td>-49.97</td>
<td>-9.12</td>
<td>+11.30</td>
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</table>

9. Costs of education, health and other public facilities and programmes and overall urban fiscal impact

1.367. Table XXIII.8 contains cost estimates for education, health and other public facilities and programmes for the Metroville in addition to the project costs described earlier.
### Table XXIII.8
Costs of education, health and other public facilities and programmes

<table>
<thead>
<tr>
<th>Sector facility</th>
<th>Number of units</th>
<th>Capital cost per unit (PRs.)</th>
<th>Capital costs (PRs. lakhs)</th>
<th>Operating costs per unit (PRs.)</th>
<th>Operating costs per year (PRs. lakhs)</th>
</tr>
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<tbody>
<tr>
<td>Primary schools</td>
<td>6</td>
<td>100 000</td>
<td>6.0</td>
<td>170 000</td>
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<td>Secondary schools</td>
<td>4</td>
<td>250 000</td>
<td>10.0</td>
<td>283 000</td>
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<tr>
<td>Health</td>
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<tr>
<td>Health centres with maternity wing</td>
<td>1</td>
<td>374 700</td>
<td>3.7</td>
<td>465 900</td>
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<td>Social welfare</td>
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<td>Community centres</td>
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<td>420 000</td>
<td>4.2</td>
<td>250 000</td>
<td>2.5</td>
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<td>Industry and commerce</td>
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<td>Technical assistance</td>
<td>In administrative centre</td>
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<td>and training</td>
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<td>Supply and marketing depot</td>
<td>1</td>
<td>20 000</td>
<td>0.2</td>
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<td>0.0</td>
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<td>Urban water supply, sewageage and drainage</td>
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<td>Off-site trunk infrastructure</td>
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<td>Maintenance and operations</td>
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*a/ Costs taken from Chapter XX, Education and Training.*

*b/ Costs taken from Chapter XXI, Health and Population Planning.*

*c/ Special pilot project. Cost estimates prepared by Karachi Development Plan project staff.*

*d/ Cost estimate prepared by Karachi Development Plan project staff. Operating costs of supply and marketing depot should be covered out of sales.*

**1.368.** The capital costs amount to PRs. 49.1 lakhs which, together with the project costs of PRs. 152.1 lakhs, bring the total project public sector costs to approximately PRs. 201.2 lakhs. The major items in addition to the direct projects costs are off-site trunk infrastructure (PRs. 25.0 lakhs) and education facilities (16.0 lakhs).

**1.369.** The operating costs generated by the project are substantial. By the completion of project development they will total PRs. 11.7 lakhs per year. The major item will be for education (PRs. 21.5 lakhs per year).

**1.370.** The off-site infrastructure costs and other non-project costs will be financed by means of the system of intergovernmental finance in Karachi. Much of it will be financed directly by the various agencies involved in the
project out of metropolitan property taxes, user charges and fees. The Metroville programme will make possible ownership of land and a housing unit for the low-income groups, and will foster a sense of civic responsibility. It will increase the property tax base and strengthen the metropolitan fiscal structure.

1,371. One of the key items in the proposed financing system for metropolitan development is the use of water meters and imposition of charges for actual metered water and sewerage usage. This should result in the more economic use of scarce water and improve the financial base of the system. It is proposed in Chapter XII for the Metropolitan Area as a whole that water charges be increased to cover not only operating costs and off-site infrastructure costs but also a portion of on-site infrastructure costs. This should be the eventual objective in the Metroville. Water meters should be installed in the Metroville. The initial rates should be equivalent to or slightly higher than those charged elsewhere in the City for unmetered water. The rates in the Metroville can be increased as the rest of the city is converted to a metered system and the rates are raised in all parts of the City.

3. Housing cost estimates and financing

1,372. Housing cost estimates and financing are presented here because the latter is so important for the rapid completion of the Metroville. The housing cost estimates are based upon the income groups expected to live in the Metroville and the expenditures of each income group for housing as described in Chapter XI. It is assumed that all the housing in the Metroville except the bungalows will be financed by HSFC at an interest rate of 6.5 per cent, with a 15 per cent downpayment and a 15-year repayment period. Bungalows could be financed either by HSFC or conventional banks, but at a higher interest rate.

1,373. It is noted that the interest rate appears to be too low to establish an on-going large-scale programme and that consideration might be given to charging higher interest rates in future projects.

1,374. The total housing costs including land costs are P6.275.20 lakhs, including 206.29 lakhs for all housing except the bungalows and 69.31 lakhs for bungalows. Land costs amount to P6.139.69 lakhs, or 51 per cent of the total costs. The average cost of all housing except bungalows in the Metroville is expected to be approximately P6.3,665. Housing cost estimates are presented in Table XXIII.9, First Metroville project, housing cost estimates.
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<tr>
<th>Housing type</th>
<th>Plot size or level req'd. (sq.yds.)</th>
<th>Location</th>
<th>Number of units</th>
<th>Total project revenues (P Rs. lakhs)</th>
<th>Housing structure costs</th>
<th>Housing costs</th>
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First Metroville project: housing finance programme (all housing except bungalows) (Rs. lakhs, 1973/1974 prices)

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<tr>
<th>Year</th>
<th>Expenditures</th>
<th>Downpayments</th>
<th>Loans</th>
<th>Repayments</th>
<th>Net yearly balance</th>
<th>Cumulative balance</th>
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<td>43.65</td>
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<td>51.35</td>
<td>7.70</td>
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<td>7.70</td>
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<td>174.39</td>
<td>274.18</td>
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1.775. The maximum cumulative cash outlay is Rs.138 lakhs in 1979. The NBFC should reserve this amount or more for the Metroville Project. The project is expected to generate a positive cumulative balance by 1987. After this date funds generated from repayments on the First Metroville can be used to finance other Metrovilles.
FINANCING THE DEVELOPMENT PLAN

A. TRENDS AND ISSUES

1.376. The inadequacy of existing financial resources, relative to Karachi's needs, is aggravated by programme imbalances, an insufficiency of programme and project planning skills, and a shortage of management skills.

1.377. Table XXIV.1 shows proposed expenditure patterns of each of the governments in the Karachi Region for the fiscal year 1972/1973. The total amount of public resources scheduled for development purposes amounted to PRs.31.98 crores, of which the Centre, Sind and local contributions are PRs. 10.39, PRs.5.40 and PRs.16.19 crores respectively. Total public expenditures for development amount to over 4 per cent of gross non-agricultural output. This is a substantial amount, but it must be kept in mind that, given the level of development in Karachi's economy, it translates into only PRs.80 per capita.1/

1 Resource deficiencies and programme imbalances

1.378. The overall picture is considerably worsened when the composition of expenditures and programme priorities relative to current development objectives is taken into account. It

1/ Assuming an urban population of 4 million in the Region in 1972. The local portion is equivalent to approximately PRs.40 per capita. These per capita figures may be compared with City Government Capital expenditures in the United States which, for 1970-1971 in municipalities of 1 million or more averaged $85.49 per capita, equivalent to approximately PRs.846 per capita at an exchange rate of $1.00 = PRs.9.90. This does not include direct federal or state expenditures in municipalities. See: International City Management Association, The Municipal Yearbook 1973. Washington, D.C.: ICMA, 1973 (Tables 4/5, p.96).
### Table XX:
Annual Development Programmes - 1972/73. Expenditures in Karachi, by agency (FRs. crores):

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<th>Development sector</th>
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<th>SNE</th>
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<th>DDC</th>
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<th>SITE</th>
<th>Sind</th>
<th>Central</th>
<th>Total</th>
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<td>3.65</td>
<td>3.37</td>
<td>.11</td>
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<td>(.33)</td>
<td>(1.57)</td>
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<td>M. Social welfare services</td>
<td>-</td>
<td>.52</td>
<td>.07</td>
<td>.06</td>
<td>.03</td>
<td>.07</td>
<td>.15</td>
<td>.07</td>
<td>-</td>
<td>.97</td>
</tr>
<tr>
<td>N. Miscellaneous programs</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>8.55</td>
<td>6.28</td>
<td>.73</td>
<td>.06</td>
<td>.08</td>
<td>.19</td>
<td>.304</td>
<td>5.40</td>
<td>10.39</td>
<td>31.98</td>
</tr>
</tbody>
</table>
is evident from the data presented in the Annual Plan 1972/1973 that the concern for production programmes and physical infrastructure development ranked very high in the allocation of government resources in that year. For the entire nation the public sector allocated almost 80 per cent of its resources for these purposes, leaving only 20 per cent to be divided among physical planning, housing, human resources and social development.

1.379. The situation is somewhat better in the Karachi Region, where physical planning and housing (27.6 per cent) and human resources and social development (12.4 per cent) accounted for approximately 40 per cent of the total. About Rs.20 crores were allocated to urban development and the alleviation of urban deterioration in Karachi, or about Rs.57 per capita. Even though expenditure patterns in Karachi are more progressive than those in the rest of the nation, it will be necessary to alter substantially the allocation of resources to accomplish the objectives of the Development Plan.

2. Programme and project planning

1.380. Effective regional planning should involve not only the Master Plan Department of KDA but also planning groups in each of the various executing agencies in the Region. One of the most pressing needs is to strengthen the planning function in individual agencies within the framework of overall area planning. There are many instances of projects in Karachi which were efficiently executed but for which the basic planning was inadequate. For example, Korangi and North Karachi were developed as part of the Greater Karachi Resettlement Scheme to provide housing and services for refugees. Facilities were constructed rapidly, but in both areas population growth has been slow because the projects were poorly located with respect to job opportunities and other urban services, and substantial outbacks in construction were necessary. Had the initial analyses of the urban housing market and location been better, the projects might have been much more successful and the return on the capital invested much higher.

3. Management

1.381. The capacity for construction is impressive for some urban functions and facilities such as the port, the airport, the railway, major highways, bulk water treatment and supply and high-income housing but there are often difficulties in the management and operation of facilities after they have been constructed. For some types of facility, cost overruns are common in the construction phase itself and the period of transition from construction to operation often is longer than originally scheduled.

4. The role of the several levels of government

1.382. At the Central Government level, there are possibilities for income and corporation tax reforms to increase revenue, but the most likely course appears to be heavier indirect taxation on what might be considered to be "luxury" goods and services,
1,383. The provincial government should not be expected to increase its revenue receipts so greatly that it will have substantial additional funds, raised from its own resources, to allocate to development in Karachi. Poverty and development needs elsewhere in Sind are such that the demands on provincial resources from outside Karachi will remain considerable.

1,384. At the local and provincial level, the principal opportunity for increased revenue is in connexion with taxes and charges related to real property, use and public services provided to properties. Such taxes and charges can be designed to recapture part of the economic gain from public investment, to steer land uses in desirable directions, and to economize on the use of public services.

3. The role of the semi-private and private sectors

1,385. It is essential to keep in mind that both the semi-private and private sectors have important roles to play in Karachi's development, and that their contribution is vital to the mobilization and efficient expenditure of resources. For example, the HBFC is expected to allocate for existing programmes in Karachi in 1974/1975 Rs. 6 crores, a very significant amount when compared to the total public sector expenditures in 1972/1973 of Rs. 12 crores. Particularly in activities involving large numbers of transactions (where the market is likely to be more effective than centralized decision-making for allocating resources) it is important that the Government rely upon the private sector for programme implementation, although the Government may have to be involved to ensure that the public interest is represented. The proposals for housing and transportation include continued support for and involvement of the private sector. This should facilitate the mobilization of additional revenues for social objectives and efficient delivery of the necessary services in these sectors.

B. DEVELOPMENT RESOURCES AVAILABLE TO THE DEVELOPMENT PLAN

1,386. Many difficulties were encountered in the attempt to construct forecast estimates of the development resources that would be available to finance the Development Plan. One of the most intractable problems concerned the issue of resource "availability". Given strong Central Government authority and fragmented local authority, it has been difficult to identify definitively the development resources likely to be available for the implementation of the Plan.

1,387. The principal reason for this dilemma is that Karachi is only now beginning to face the challenge of urban growth problems through the vehicle of development planning, like many other major cities in the developing world it finds itself institutionally unprepared. Because of this the extent to which each of Pakistan's public, semi-public and semi-private bodies is prepared to participate in the implementation of the Karachi Development Plan is still uncertain. A resolution of this question is necessary to a clear definition of the total resources available to finance the Plan.
1,388. For the purposes of the present recommendations the Total Resources Pool (TRP) has been defined to contain the development resources of the public sector (Central Government, Sindh government, KDA, KMC, and four other local bodies); the semi-public sector (Karachi Gas Company, Karachi Electricity Supply Corporation, Karachi Port Trust and Bundar Qasim Port Authority); and the semi-private sector (housing financed by the House Building Finance Corporation and transport financed by the public sector). The Development Resource Pool (DRP) within the TRP comprises the public sector and semi-public sector resources (which are assumed to be available for the purpose of financing the Plan). The resources of the semi-private sector is expected to be induced or heavily influenced by mobilization of the DRP (in conjunction with various types of pricing policies and land use controls).

1,389. This is not to imply that the Development Plan is unconcerned with the investment activities of the rest of the private sector, or that these other activities will be unaffected by the mobilization of the Plan, but its primary concern for the programming of expenditure is with the public, semi-public and semi-private sectors.

1,390. TRP estimates must be provisional for several reasons. First, the resources of Karachi's public bodies must become totally available to finance the future expenditure requirements of the Plan. This would include the public sector resources of KDA, KMC, four other local bodies and the combined resources of the Central and Sindh Governments that are recurrently invested in the Karachi Region. It must be assumed that some regional agency will be in the position of exercising discretionary control over the disposition of these "available" resources. Second, the Development Plan must be used in the formulation of Pakistan's Annual Plans. The assembled plans of the provincial governments establish the basis for the Annual Plan of the Central Government, and it is virtually impossible to anticipate modifications beforehand; the estimates will therefore remain provisional until such time as the Central Government completes those adjustments. Third, there were a number of empirical limitations in the preparation of the estimates. The forecast estimates are based on financial data contained in the 1972/1973 Budget, not from time series covering earlier years. The development resources of the public sector were forecast as a function of the Gross Domestic Product of Pakistan and the Gross Regional Product of the Karachi Region. Those of the semi-public sector were based on expenditures already proposed by the agencies concerned (modified in some cases as a result of the Development Plan). Resources of the semi-private sector (houses and housing) were estimated as total loan repayments under the programme and financing proposals described earlier. The forecasts are presented in Table XXIV.2, Revised TRP provisional estimates.
### Table XXIV.2

Revised TRP provisional estimates (PRs. crores)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1974/1975</td>
<td>9.96</td>
<td>4.04</td>
<td>13.43</td>
<td>0.00</td>
<td>0.00</td>
<td>37.32</td>
<td>64.75</td>
</tr>
<tr>
<td>1975/1976</td>
<td>10.54</td>
<td>4.29</td>
<td>14.68</td>
<td>3.71</td>
<td>0.07</td>
<td>39.04</td>
<td>72.33</td>
</tr>
<tr>
<td>1976/1977</td>
<td>10.90</td>
<td>4.32</td>
<td>16.00</td>
<td>6.18</td>
<td>0.28</td>
<td>40.84</td>
<td>78.72</td>
</tr>
<tr>
<td>1977/1978</td>
<td>11.40</td>
<td>4.79</td>
<td>17.48</td>
<td>8.65</td>
<td>0.67</td>
<td>42.73</td>
<td>85.72</td>
</tr>
<tr>
<td>1978/1979</td>
<td>11.94</td>
<td>5.07</td>
<td>19.10</td>
<td>10.25</td>
<td>1.47</td>
<td>44.68</td>
<td>92.51</td>
</tr>
<tr>
<td>1979/1980</td>
<td>12.52</td>
<td>5.36</td>
<td>20.88</td>
<td>7.30</td>
<td>2.96</td>
<td>46.72</td>
<td>95.74</td>
</tr>
<tr>
<td>1980/1981</td>
<td>12.92</td>
<td>5.65</td>
<td>22.78</td>
<td>5.58</td>
<td>4.59</td>
<td>48.91</td>
<td>100.43</td>
</tr>
<tr>
<td>1982/1983</td>
<td>13.78</td>
<td>6.28</td>
<td>27.19</td>
<td>3.00</td>
<td>7.88</td>
<td>53.52</td>
<td>111.65</td>
</tr>
<tr>
<td>1984/1985</td>
<td>14.75</td>
<td>6.99</td>
<td>32.52</td>
<td>3.00</td>
<td>11.59</td>
<td>58.71</td>
<td>127.56</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>136.31</strong></td>
<td><strong>59.38</strong></td>
<td><strong>238.69</strong></td>
<td><strong>54.52</strong></td>
<td><strong>45.33</strong></td>
<td><strong>519.62</strong></td>
<td><strong>1054.04</strong></td>
</tr>
</tbody>
</table>

a/ Revised since Draft Final Report to exclude resources associated with programmes for housing and public transport.
1,391. There are a number of compositional aspects of the TRP estimates that should be clarified. Looking at Table XXIV.i, it is evident that the public sector (PRs.435 crores) contributes less than the semi-public sector (PRs.520 crores) to the 11-year TRP total. The local government sector relies heavily on the resources of KDA and KMC which account for about PRs.215 crores, while the combined resources of the Karachi Cantonment Board, Karachi District Council, Landhi-Korangi Municipal Committee and S.I.T.E. account for the residual PRs.24 crores. Similarly, the internal composition of the semi-public sector is even more heavily dominated by the resource projections for KEPCO (PRs.332 crores) and KPT (PRs.155 crores) relative to those of KGC (PRs.31 crores). The semi-private sector (transport and housing finance) is expected to contribute substantially (PRs.55 crores and PRs.43 crores respectively) to the total pool of development resources. It is clear from the composition of the TRP estimates, therefore, that the financial requirements upon the resources of the Central Government, the Sind government, KEPCO, KPT, KDA, KMC, the HNFC and public sector transport. These are expected to contribute about 95 per cent of the total.

1,392. The TRP projections are quite sensitive to variations in the rate of growth of national output. It is assumed that the average annual rate of growth of national output over the 11-year period will vary between a lower limit of 4.0 per cent and an upper limit of 7.0 per cent, with 5.5 per cent as an intermediate rate. The incremental effect of this sensitivity is such that a mere 0.5 per cent increase (or decrease) in the national growth rate yields almost a PRs.160 crores increase (or decrease) in the TRP. Thus, for example, if the average annual growth rate in Pakistan turns out to be 6.0 per cent over the next 11 years, the TRP could become PRs.1,214 crores, an amount that should be kept in mind when considering the resource-expenditure gap discussed below.

1,393. Estimates of resource availability in the private sector could not be calculated. There are simply no current statistical data on private savings and development (investment) expenditures in Karachi on which to base estimates of their future magnitudes. If such data existed, they probably would indicate that the ratio of private to public investment is extremely high, and that the major share of private savings is channeled into industrial, commercial and high-income residential development. The high ratio of private to public investment can be explained partly by the fact that a very large proportion of the public resources raised in Karachi are transferred out of Karachi for use in other parts of Pakistan, while the private investment pattern reflects an economically efficient allocation of scarce development resources to their most profitable, low-risk uses.
C. DEVELOPMENT PLAN EXPENDITURES
AND THE NEED FOR SUPPLEMENTARY FINANCING

1. Development Plan expenditures

1,394. The Development Plan was constrained by the Development Resources Pool and the institutional structure of Karachi. Nevertheless, the proposed Plan expenditures, as shown in Table XXIV.3, will press to the limit the financial and management capability of the governmental agencies concerned.

1,395. The total level of capital expenditures proposed for the 11-year period beginning 1974/1975 and ending 1984/1985 is PRs.1,404 crores. The capital expenditures are dominated by water resource development (PRs.104 crores), regional transport (PRs.182 crores), housing (PRs.127 crores), urban water, sewerage, drainage and solid waste disposal (PRs.253 crores), electricity (PRs.332) and communications (PRs.147 crores). The total level of expenditure for education (PRs.162 crores) ranks it behind water resource development, regional transport, urban water supply, sewerage, drainage and solid waste disposal and communications in the overall list of priorities. The proposed expenditures reflect the need to extend services to a much broader range of population groups. They also reflect the need to develop the water resources of the Region, the need for a new port at Sundar Qasim and a new rail Marshalling Yard at Pipri, the need to upgrade housing, water supply and sewerage. Of particular interest is the relatively low level of expenditure assigned to urban roads — only PRs.18.6 crores after subtracting expenditures for the supplementary transport programme. This reflects a judgement by the planning staff and policy review groups that with the exception of a few important (but in the aggregate only moderately costly) projects, the present road system is adequate to accommodate the traffic expected through 1985, particularly if public transportation modes are supported and expanded rapidly.

1,396. It has not been possible to estimate fully the direct foreign exchange requirements of the expenditures proposed, but estimates have been made for urban water supply, sewerage, drainage and solid waste disposal, gas, electricity, urban roads and communications. For these items (which together account for expenditures of PRs.785 crores or 56 per cent of all expenditures), the foreign exchange component is PRs.409 crores. On this basis the foreign exchange component for all items could be in the range PRs.550-750 crores. The foreign exchange required for the Plan reflects the effort to keep this component of expenditures as low as possible.

1,397. The estimate of approximately PRs.1,404 crores capital requirements for the 11-year period does not, of course, suggest that the net claim on public resources will be this large. Many of the projects proposed will generate revenues for the public sector prior to 1985. Recurring cost estimates are not available presently for several sectors. Full programming and budgeting, with cash flow analysis, should be undertaken as part of the continuing planning and development process which the present project has been designed to initiate.
<table>
<thead>
<tr>
<th>Production programme, physical infrastructure and housing</th>
<th>Capital outlay</th>
<th>Foreign exchange</th>
<th>Domestic funds</th>
<th>Recurring outlay</th>
<th>Total outlay</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII. Water Resources Development</td>
<td>103.54 A/</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>103.54</td>
</tr>
<tr>
<td>VIII. Regional Transport</td>
<td>181.70</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>181.70</td>
</tr>
<tr>
<td>IX. Agriculture</td>
<td>14.20 D/</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>14.20</td>
</tr>
<tr>
<td>X. Industrial and Commercial Development</td>
<td>56.48 G/</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>56.48</td>
</tr>
<tr>
<td>XI. Housing</td>
<td>126.56 E/</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>126.56</td>
</tr>
<tr>
<td>XII. Urban Water Supply, Sewerage, Drainage and Solid Waste Disposal</td>
<td>252.51 G/ (125.96 D/ (111.05) E/)</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>252.51</td>
</tr>
<tr>
<td>XIII. Electricity and Gas</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td>332.39 A/</td>
<td>187.09 A/</td>
<td>145.39 A/</td>
<td>N.A.</td>
<td>332.39</td>
</tr>
<tr>
<td>Gas</td>
<td>32.23 D/</td>
<td>9.39 D/</td>
<td>22.93 D/</td>
<td>N.A.</td>
<td>32.23</td>
</tr>
<tr>
<td>XIV. Urban Transport</td>
<td>41.70 G/</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>41.70</td>
</tr>
<tr>
<td>Public Transport</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roads and Supplementary Works</td>
<td>20.18</td>
<td>(11.61)</td>
<td>(7.00)</td>
<td>N.A.</td>
<td>20.18</td>
</tr>
<tr>
<td>XV. Communications</td>
<td>147.22 D/</td>
<td>71.61 D/</td>
<td>73.61 D/</td>
<td>N.A.</td>
<td>147.22</td>
</tr>
<tr>
<td>XVI. Tourism and Recreation</td>
<td>14.03</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>14.03</td>
</tr>
<tr>
<td>Human Resources and Social Development</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XIX. Manpower, Employment and Labour</td>
<td>1.55 A/</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>1.55</td>
</tr>
<tr>
<td>XX. Education and Training</td>
<td>34.55</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>34.55</td>
</tr>
<tr>
<td>XXI. Health and Population Planning</td>
<td>14.41</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>14.41</td>
</tr>
<tr>
<td>XXII. Social Welfare Services</td>
<td>3.28</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>3.28</td>
</tr>
<tr>
<td>The Metroville Programme</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XXIII. The First Metroville Project</td>
<td>1.52</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>1.52</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>26.56 A/</td>
<td>N.A.</td>
<td>N.A.</td>
<td>N.A.</td>
<td>26.56</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1,403.49</td>
<td>(407.48)</td>
<td>(361.98)</td>
<td>209.86</td>
<td>1,413.43</td>
</tr>
</tbody>
</table>

B/ Preliminary estimate based upon experimental agriculture programme.
C/ Capital made available by I/HFC net of downpayments (Rs. 22.60 crores) and Metroville Project (Rs. 1.52 crores).
D/ Net of connection expenses and preliminary pending review of proposed projects to ensure consistency with Development Plan.
E/ Capital made available by public transport finance agency net of downpayments (Rs. 9.28 crores).
F/ Net of water, sewerage and drainage reticulation.
G/ Preliminary estimate pending review of proposed projects to ensure consistency with the Development Plan.
The figures presented can be regarded only as crude indicators of the orders of magnitude of the expenditures required. They have been obtained from several sources, and it has not been possible to reconcile them fully to establish a common base for unit costing or expected price changes. A substantial amount of detailed programming and budgeting work is required to provide a proper basis for specifying metropolitan and regional components of Provincial Annual Development Programmes and National Annual Plans.

1,398. In spite of their crudity, however, the figures do make clear the fact that the Plan represents a rapid departure from the expenditure priorities of the recent past, which overemphasized expenditures for roads and underemphasized those for urban water supply, sewage, drainage, solid waste disposal, housing and other items. This will require shifts in the deployment of equipment and manpower, as well as in institutional relationships, that must be accomplished as rapidly as possible if the Plan is to be implemented as proposed.

2. The resource-expenditure gap and the need for supplemental financing

1,399. Table XXIV.4 provides a summary comparison of the expenditure requirements of the Development Plan with the provisional forecasts of financial resources, and identifies the resulting resource-expenditure gap. The overall gap is approximately Rs.350 crores, but this includes in the Central Government figures a gap of Rs.100 crores for communications which recent forecasts provided by Pakistan Telegraph and Telephone (PT&T) suggest will not occur. If this Rs.100 crores gap is eliminated, the residual resource-expenditure gap will be only Rs.250 crores. Broken down by sector, the Rs.350 crores gap is Rs.281 crores for the public sector (EDA, KMC, other local governments and Central and Sind Government) and Rs.68 crores for the semi-private sector (housing and public transport finance). Clearly, the burden of financing the Development Plan falls upon these two groups. Improvements in land taxation, more realistic user charges for public services, better land development decisions, an increase in bus fares and the establishment of fully-operational housing and public transport financing programmes on a large-scale are essential to the achievement of the objectives of the Plan.

1,400. The gap might be reduced by a rate of growth of the economy higher than that upon which the resource forecasts are based, but this would in turn call for higher levels of expenditure. The provisional character of the resource projections must be kept in mind. The forecasts are generous. They assume considerable foreign aid, a rapid rate of economic growth and substantial administrative reform and probably err on the side of optimism. For these reasons, the Public sector resource-expenditure gap should be regarded as serious. The Plan must look to supplementary sources of financing, for the consequences of a failure to develop supplementary sources of financing would be severe: urban services would continue to be very poor, environmental conditions would become worse and the rate of growth of the economy probably would be reduced. Proposals for supplemental financing are presented below.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Expenditure requirements</th>
<th>Financial resources</th>
<th>Gap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KDA, BMC and other local</td>
<td>238.68</td>
<td>195.89</td>
<td>42.89</td>
</tr>
<tr>
<td>local entities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central and Sind</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td>715.75</td>
<td>434.57</td>
<td>281.18</td>
</tr>
<tr>
<td>Semi-public</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KESC, KGC</td>
<td>364.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KPT, Bundar Gazim</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port Authority</td>
<td>155.00</td>
<td>155.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Subtotal</td>
<td>519.62</td>
<td>310.00</td>
<td>209.62</td>
</tr>
<tr>
<td>Semi-private</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>126.56</td>
<td>45.33</td>
<td>81.23</td>
</tr>
<tr>
<td>Buses</td>
<td>41.70</td>
<td>54.52</td>
<td>-22.82</td>
</tr>
<tr>
<td>Subtotal</td>
<td>168.26</td>
<td>99.85</td>
<td>68.41</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,403.63</td>
<td>1,054.04</td>
<td>349.59</td>
</tr>
</tbody>
</table>

\(^a/\) This will be reduced to a gap of approximately PRs.250 crores if the estimated gap of PRs.100 crores for communications is eliminated, as noted in the text.

### D. RECOMMENDATIONS FOR FINANCING

#### 1. Policy guidelines

1,401. The objectives and policy guidelines that underlie the recommendations for the financing of development in the region are listed below, approximately in order of the importance that should be attached to them.

1a) The revenue system should be designed with the real limitations of present administrative capabilities in mind. These limitations can be overcome, but it takes rather explicit “system design” to do so. There are two general rules that should be followed:

1i) the total number of individuals and firms from whom tax must be collected should be minimized; for example, turnover should be taxed at the manufacturing and importing levels rather than at the retailing level;

1ii) if the number of taxpayers is large, the tax should be set up so that it is as close to self-enforcing as it can be, perhaps through publicity (for example, public property tax records) or through the use of formulas.
for determining tax liability which are so simple that underpayment or overpayment is crystal clear to all; or, simply and cruelly, by making the penalties for evasion severe and certain (for example, foreclosure and auction of real property on which tax has not been paid).

(b) There should be a concern for the income distribution effects of taxes. In high-income countries, a very considerable amount of income redistribution takes place through the expenditure side of the fiscal system, that is, through the provision of welfare, health services, education and other income in kind to all or nearly all low-income households. In lower-income countries, such as Pakistan, the level and coverage of such government programmes is necessarily far more limited. If the fiscal system as a whole is to have large income-redistributive effects it is all the more important to employ taxes that redistribute income.

(c) The revenue system should have beneficial, or at least neutral, effects on urban land use. The direct influences include those of the urban real property tax, income, wealth and capital gains taxes applied to urban real property, the level and schedule of utility charges and the pricing of leaseholds of publicly-owned land. There are a few general rules here:

(i) Taxes on the annual or capital value of buildings tend to discourage investment in buildings, and this is particularly true of geographic areas or types of buildings subjected to high rates of taxation.

(ii). Taxes on the actual capital values of buildings, or on the increase in those values over time (for whatever reason), will be neutral with respect to land use and investment decisions (i.e., will not result in unsound resource allocations). Many site owners will find that the requirement for cash with which to pay site value taxes is a force stimulating them to develop sooner and more intensively than might otherwise be the case. In contrast, taxes on land measured by its rental value in current use will tend, in an environment of rising land prices, to encourage underutilization of sites.

(iii) Under-pricing of utility and transport services tends to encourage lower-density, more dispersed urban settlement patterns.

(d) Economic distortions caused by taxes should be minimized.

(i) Uniform and general taxes are economically less damaging than differential and selective taxes, since the former have less effect on patterns of consumption, production and investment. Thus, the Central Government’s sales tax, with a uniform rate applied to a wide range of goods (albeit with numerous important exemptions), is less distorting than central excise duties, imposed at widely varying rates on a more limited range of goods. However, for administrative and income-redistributive reasons, selective taxes may be preferred on balance, despite the distortions.
(11) Taxes that impede mobility or raise the costs of transactions are to be avoided, because they interfere with the mechanics of the resource allocation process. Thus, taxes like the octroi and stamp duty are undesirable.

(a) The revenue instruments used should each produce significant amounts of revenue. It is not sensible to employ a large number of separate low-yield taxes to raise a given amount of money, even where the administrative capability to do so exists. Administrative costs will be high and it is likely that the package will contain a fair number of economically unsatisfactory taxes that are palatable solely because of their low rates. However, this criterion does not warrant the elimination of existing low-yield taxes that appear to work well in accordance with the criteria above.

2. Central Government revenue possibilities

1,402. Greater reliance on income and corporation taxes by the Central Government would tend to make the country's tax structure more progressive, that is, more income-distributing. The usual reasons for low utilization of taxes on income include their administrative procedural difficulty compared to indirect taxes, the small numbers of households with incomes above the poverty level against whom the tax can be levied, and the fear of reducing investment incentives of companies and rich individuals.

1,403. The first two of these reasons have some validity; the third is at least questionable, since there is some empirical evidence that very low tax rates on company profits are neither a necessary nor a sufficient condition to sustain additional private investment. Very high tax rates may be a deterrent, but the fiscal concessions and allowances that exist in Pakistan seem very generous by international standards.

1,404. There also appear to be opportunities with regard to selective increases in indirect taxation, applied to goods and services primarily consumed by upper-income households. By and large, the indirect taxes are easier to administer than the direct taxes on income and, while selectivity does give rise to economic distortions, desirable income-distributive effects can also be achieved. The existing internal indirect taxes do not bear heavily at all on many "luxury" or semi-luxury goods and services, except for imported goods with high custom duties. The customs schedule should be examined in framing recommendations along these lines.

1,405. Only petrol and cigarettes are subject to taxes that amount to more than 40 per cent of the retail price, and some of the taxes are startlingly low. For example, there is no taxation of sport goods and taxes on gramophone records, perfumes and hotel services are relatively low. Hotels, restaurants and cinema are the only service activities subject to indirect taxation, and many services tend to be upper-income consumption items, although they are often difficult to tax for administrative reasons. One type of upper-income consumption of services that is easy to reach by taxation is foreign travel. It is not at all difficult to devise a foreign travel tax that falls upon upper-income travelers, rather than emigrants or others.
2. Governmental financing at the local level

1,406. Local government must be reorganized if it is to be effective in planning, in providing public services and in generating additional revenues for development purposes. Local government authority is needed that can plan and direct the entire area, and, equally important, impose and collect taxes.

1,407. The Sind People's Local Government Ordinance, 1972 would establish such an authority. The question of whether local fiscal authority should be focused at the level of the Metropolitan Corporation or the People's Municipalities is one that deserves careful consideration before the Ordinance is fully implemented. If the major objective of the new taxing powers is, as it should be, to raise money for the financing of regional development, then there appear to be three major avenues by which this could be accomplished, consistent with the approach outlined above: 1) the rationalization of taxes on real property ownership and use; 2) a more aggressive, efficient and equitable utilization of user charges; and 3) the imposition of a metropolitan income and corporation tax.

(a) Urban property taxation

1,408. One of the most obvious reforms would be to extend the present urban property tax collected by the XMC to cover the entire area, at a uniform rate.

1,409. There are other similar useful reforms of the existing property tax that will improve its equity and administration but will not yield, by themselves, large amounts of additional revenue. It has been suggested that the 1967 valuation was based largely on contract rents, and ignored the practice of entering into separate agreements for furnishings, services, etc., that reduce the contract rent to a fraction of the actual rent paid.

"The 1967 assessment was not realistic in the sense that the GARV (gross annual rental value) was fixed at a lower level ignoring the rent rates prevalent at that time." (Dawn, 7 January 1973)

1,410. The Excise and Taxation Directorate claims that the recent valuation of the cantonment areas did not suffer from these defects and that the assessing authority is not bound by mutual agreements which collusively set "abnormally low" rents. Obviously, given a fixed tax rate and revaluations made at infrequent intervals, realistic and accurate assessments will produce additional revenue and should be encouraged.

1,411. An alternative way to secure additional revenue from the property tax each year, given increasing property values, rent levels and local government costs, is to permit local authorities to vary the tax rate itself, whether or not property is revalued frequently. Annual property tax rate changes are likely to be much larger in periods of inflation, but even so, they may do no more than offset the increase in property values while official valuations remain unchanged.
1.412. The more important reason for freedom to vary property tax rates is that it gives the local authorities some flexibility and fiscal autonomy. Ideally, valuations should be kept current and tax rates should be free to vary as well; this solution is more equitable to individual property owners (all properties do not appreciate equally in value over time), as well as providing flexibility to the local authority.

1.413. The kind of financing system recommended in the 1972 Ordinance -- strong Metropolitan government with considerable responsibility for raising revenue for development purposes -- would seem to call for, as a minimum, some degree of freedom for the Metropolitan entity to vary tax rates over time.

1.414. A final class of reforms in the existing property tax relates to administrative procedures. First, there appears to be a need for more publicity about the whole valuation process, assessment guidelines need to be established in advance (which is not now provided in the rules) and permission for the valuation lists should be continuously open to public inspection. This assists taxpayers in making comparisons and appeals and is also a check on the accuracy and honesty of the valuation process. Second, the property tax should become a lien against the property the day it is levied and take precedence over all other claims, thus prohibiting the sale or transfer of the property unless the lien is satisfied. Moreover, if property taxes are not paid within a specified period (usually three years), the local authority should take title to the property and resell it at auction.

(b) Site value tax

1.415. The most desirable reform would be site value taxation, taxing only land values, not buildings, on the basis of the market value of each site (which means its value in the highest permissible use, discounted by the probability of its actually being converted to that use in the foreseeable future). Site value taxation is neutral with regard to land use and investment decisions. The present property tax tends to discourage new construction, improvements and even normal maintenance expenditure, and tends to encourage the withholding of land from development since idle land has no annual rental value and therefore no tax. The need for cash to pay the site value tax would exert pressure on owners of idle land to develop it. The site value tax, as a tax on an economic surplus, must be borne, at least in principle, by the owner of the site (whether leasehold or freehold) and cannot be shifted to the occupant or tenant.

1.416. A major advantage of the site value tax is that it affords an opportunity to recapture, for public sector use, some of the increases in land values created by population growth and public investment in community facilities and utility and transport services.

1.417. The revenue possibilities are considerable. If the total value of land in the Karachi area was in 1970 Rs.600 crores, the net income from land was 10 per cent per annum and if the rate of increase in land values was also
10 per cent per annum (both of these rates are no doubt lower than the actual ones), then a 5 per cent site value tax would recoup less than one-half of the return from land and less than one half the annual increase in land values. Even so, the tax would have raised Rs. 10 crores annually, compared to the approximately Rs. 5 crores now being collected in Karachi in local and provincial property taxes.

1,418. A system of property taxation that is intermediate between the existing system and the site value tax is the North American variant of the property tax. In this system, taxes on land and buildings are levied on the basis of capital value, not annual rental values, and the standard for determination of capital value is market value. If properly applied, this system has two advantages. First, it taxes land on the basis of its value in its highest use, not its actual use, thus taxing some idle land heavily. Second, newer, higher-quality buildings have a capital value which is a larger multiple of annual rents than do older, lower-quality buildings. A uniform tax rate on capital value will yield taxes that are a higher percentage of gross annual rental value for the newer and better buildings. Thus, taxing buildings on the basis of capital value can achieve the objective of the Sind Government's graduated rate scheme without the drawbacks of that scheme.

1,419. The capital value taxation system does act as a deterrent to new construction, but it is a milder deterrent than the Gross Annual Rental Value taxation system, and it taxes land values more heavily. The major disadvantage is that it would require the establishment of a completely new valuation system and complete retraining of present assessment officials.

1,420. There are still other ways of recovering revenue from the increase in land values. One is a system of betterment charges, that is, the financing of specific public investments like transport and utility facilities and services through charges that are related to the increases in land values these improvements create. It is used, for example, in Colombia, South America, where municipal public works are heavily financed by a tax called the "valorization tax." In Colombia's second city, Medellin, with a population of over 1 million, virtually all municipal and provincial public works are so financed. The project costs (120 per cent to allow for financing and administrative expenses) are assessed against the owners of property in the immediate neighbourhood of the project and distributed among them on the basis of a formula that reflects land value increases due to the project. It is a complicated but not impossible tax to administer, and it is popular among property owners, since the public improvements tend to increase land values by four, five or even ten times the property cost.

g Public land leases

1,421. Local authorities in Karachi have at hand even more direct ways of recovering some fraction of increases in land values. One way would be to re-negotiate and increase ground rents on publicly-owned land, and dispose of land in the future on the basis of leases that provide for periodic upward revision of ground rents. A second way is to
sell the leaseholds at higher prices, eliminating the current practice of disposing of land at low prices, only to find that the purchaser can resell it within a relatively short period at a substantial profit. For this to occur, the local bodies, particularly KDA, must be under less financial pressure to sell lots off to raise funds as soon as improvements have been made. KDA would need budgetary allocations that enable it to hold out for higher prices.

(d) User charges

1.422. The principal revenue opportunity, aside from taxes on property, appears to be a more aggressive and efficient utilization of user charges for those public services with clearly identifiable beneficiaries. There is no public purpose served in extravagant use of water (for example, gardening in high-income areas) or of transport in the form of private car use. In the case of water and sanitation it is no exaggeration to suggest that it will be impossible to achieve a viable metropolitan water and sanitation system unless user charges are revised drastically. The present rate structure threatens the very survival of the City.

1.423. The public purpose in utility and transport services is to assure an adequate minimum of service to all low-income households and to stand ready to provide service in excess of that only to the extent that users are willing to pay the full public costs of the services. Given the financial limits on the public sector, any other policy, such as providing below-cost services to upper-income households, is likely to mean undersupplying the poor with these services, or diverting public funds from other essential services, such as education and health, into what amount to luxuries for the rich.

1.424. For example, collecting water charges in the KMC area by means of a uniform tax on Gross Annual Rental Value is clearly inefficient, since it does not discriminate on the basis of the amount of water used by individual households. It is a fair presumption that, as contrasted with water charges based on metering of actual use, the present system greatly undercharges high-income residential properties and may overcharge (at least in relative terms) all other types of property.

1.425. A second recommendation, although less specific, relates to private car use. Taxes on cars themselves may be high, because of customs duties, but there are no local taxes or charges related to car use, other than petrol taxes which are relatively low in Pakistan. The power of the KMC to levy a vehicle tax, which yielded the KMC Rs. 40 lakhs annually before being taken over by the Province in 1968, is delegated to the Karachi Metropolitan Corporation by the People's Local Government Ordinance, but when it may be exercised by the Corporation and at what rates have yet to be decided. There are some possibilities for more effective user charges on car use, including a Metropolitan Corporation supplement to the petrol tax and parking charges in central areas.

(e) Metropolitan income and corporation taxation

1.426. A Metropolitan surcharge on the personal and corporate income taxes paid by Karachi residents and firms to the Central
Government and collected by the Central Government has some attractions, but correcting the substantive and administrative defects of the existing Central income tax should be a first priority, and there must be some hesitation in suggesting that this additional complication be introduced. However, the Central income tax to be improved, a Metropolitan surcharge might be reconsidered. It should be noted that this is an important and smooth-functioning source of local authority revenue in Scandinavia.

[f] Other local government revenue possibilities

1,427. Revenue opportunities for Karachi local authorities beyond user charges, road-user taxes, parking charges and property-related taxes are very limited. The Central Government imposes a wide range of sales and excise taxes and the Provincial Government still other selective excises and duties. There are several luxury commodities that are not taxed at the Central or Provincial levels and such goods and services probably should be taxed at the Central Government level.

[g] Taxes that should be abandoned

1,428. Local authorities collect significant sums from the octroi. Far from being a promising source of added revenue, the policy goal should be to eliminate the octroi eventually. It is one of the very worst taxes. It has very high collection and compliance (transport delay) costs, relative to the revenue generated. It interferes with and acts as a deterrent to the growth of internal trade. Octroi taxes have been one of the factors discouraging the development of wholesaling and some retailing in outlying areas such as Korangi. A double octroi has been levied on taxed items coming first into Karachi and being transported out to Korangi for sale, crossing the Municipal boundary a second time. It is unquestionably regressive in its income-distributive effects. There is nothing positive to say for it.

1,429. Local authorities are also empowered to levy taxes on faculty of the privilege of engaging in various occupations. If the tax is based upon income, then these taxes pose major administrative difficulties which confront a locally-collected income tax in an environment like Karachi. Income taxes are perhaps the most difficult of all taxes to administer well when business and personal record-keeping is poor, when reference data for cross-checking (like social security records and employment data) is lacking, when illiteracy is common and when the devices for evasion are well-developed. If the tax is not based upon income, it becomes arbitrary, although still difficult to administer well.

4. The net fiscal drain on Karachi

1,430. The concept of net fiscal drain refers to the amount of revenues raised in Karachi by the Central and Sindh Governments, minus the amount of expenditures in Karachi by those Governments.

1,431. It is estimated that in 1972/1973 approximately 22 per cent of the Central Government's total revenue receipts were generated in Karachi (Rs.159 crores), as against about
... per cent of their total development expenditures made in Karachi (PRs. 10 crores). Equivalent estimates were produced for the Sind Government which would indicate that about 44 per cent of their total revenue receipts were raised in Karachi (PRs. 25 crores), as compared with 16 per cent of their total development expenditures made in Karachi (PRs. 9 crores). Therefore, in 1972/1973 the combined net fiscal drain on Karachi to the rest of the nation is estimated to have been about PRs. 115 crores to the Central Government, plus about PRs. 15 crores to the Sind Government, a total of PRs. 130 crores altogether. Some of the revenues collected in Karachi are custom duties on goods not exclusive to Karachi, but it is clear that the net fiscal drain would be substantial even if these were not included in the estimated revenues.

1.432. The specified resource drains to the Central and Sind Governments do not include estimates of the domestic capital receipts (primarily domestic loans) raised in Karachi by these governments. Hence, because it has not been possible to determine these amounts, the estimates of net fiscal drain are conservative.

1.433. The impact of a reduction in net fiscal drain for all items except customs duties is shown in Table XXIV.6.

| Karachi Region: Additions to Total Resources Pool created by a reduction in net fiscal drain (PRs. crores) |
|-------------------------------------------------|-------------------------------------------------|
| | 100 per cent reduction in Sind | 100 per cent reduction in Central |
| 1974/1975 | 22.00 | 115.17 |
| 1975/1976 | 22.93 | 121.40 |
| 1976/1977 | 23.94 | 128.22 |
| 1977/1978 | 24.96 | 135.29 |
| 1978/1979 | 26.03 | 142.72 |
| 1979/1980 | 27.13 | 150.55 |
| 1980/1981 | 28.33 | 159.03 |
| 1981/1982 | 29.57 | 167.96 |
| 1982/1983 | 30.86 | 177.38 |
| 1983/1984 | 32.20 | 187.30 |
| 1984/1985 | 33.61 | 197.79 |
| TOTAL | 301.56 | 1 682.80 |

1.434. Allowance must be made for the fact that the "drained" resources are invested by the Central and Sind Governments in activities that partially benefit the residents of Karachi. Prime examples are defence expenditures, national investment...
projects such as Tarbela and investments in agriculture. Significant financial resources could be added to the TNP through a reduction of the net fiscal drain but it probably is unrealistic to anticipate a substantial change in the present situation because of the magnitude of the legitimate demands on Central and Provincial revenues that will continue to be made by other parts of Pakistan and Sind that are less well off than Karachi. The Nation’s major metropolis must look largely to improvements in its own fiscal system to better its condition.

E. IMMEDIATE ACTION

1. A study of property taxation

1.435. It is essential to have a detailed study of land value taxation as called for in Chapter IV. Significant improvement is possible compared to the very low present revenue from property taxes, ground rents and the sale of lots (less than Rs.10 crores) assuming at least the Rs.30 crores noted above as the yield of a 5 per cent site value tax. An ideal financing system would be the site value tax combined with better public land disposal policies (higher ground rents and leasehold prices).

1.436. Second in order of desirability (from the standpoint of the objectives) would be a combination of capital value taxation, betterment charges and better public land disposal policies.

1.437. The third ranking combination would be the existing Gross Annual Rental Value of property taxation reformed along the lines discussed above, plus betterment charges and improved land disposal policies.

1.438. A minimally adequate combination would be the third without betterment charges, but with considerably higher tax rates than are now the rule. However, since the burden of increased taxation in the first two combinations would be largely on land owners and owner-occupants of expensive property, while the burden in the third and fourth combinations would be partly on tenants, the feasibility and desirability of greatly increased revenue are considerably greater for the first two combinations.

2. Restructuring of user charges for urban services

1.439. Pricing systems are at present poorly developed for most urban services, resulting in a poor allocation of resources and loss of potential revenues. Water is metered in a few cases, but in most of the City, water charges are based on the annual rental value of property or plot size and the overall pricing structure (formal and informal) is dangerously inequitable: basic changes are fundamental to the development of an adequate water and sanitation system. Urban passenger transport rates are currently so low that they are resulting in the withdrawal of buses from service by the private sector and in the operation of services by
the private sector at a substantial loss. Urban land is often disposed of at prices far below market rates, which results in an immediate windfall gain for the buyer.

1.440. There should be an immediate reform of user charge levels, schedules and collection procedures as a means of increasing both revenue and allocative efficiency. The changes that are necessary must be introduced gradually and with proper consumer education if they are to be successful but they must begin immediately if the Metropolis is to survive.
CHAPTER XXV

THE NECESSARY INSTITUTIONAL FRAMEWORK

A. THE EXISTING INSTITUTIONAL SETTING

1. Federal powers

1,441. The roles and relationships of governmental organizations concerned with the planning and development of the Region are to a large extent dictated by the provisions of Pakistan's Constitution establishing the country's governmental structure. 1/ Pakistan is a Federation. Certain powers are granted exclusively to the Federal Government, others may be exercised concurrently by the Federal and Provincial Governments, and residual powers are vested in the Provinces. 2/

1,442. "National planning and national economic co-ordination" are the exclusive prerogatives of the Federal Government. In the absence of express mention of "physical planning" in either the Federal or Concurrent Legislative List, this subject is left to the Provinces. But physical planning cannot be regarded as a function distinct from the development functions for which the planning is undertaken, so if the development functions in question are Federal ones, they would normally be deemed beyond the control of Provincial planning authorities.

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1/ The "Constitution" to which reference is made in this Report is the new Constitution adopted 10 April 1973, which came into force 14 August 1973. The discussion of "deficiencies" necessarily relates back to agency relationships and operations under previous Constitutions. The discrepancy is not serious because the current provisions allocating powers to the Federal and Provincial Governments are substantially like those of predecessor Constitutions, at least as they relate to the concerns of the Development Plan for the Metropolitan Region.

2/ Constitution, Articles 141-142, Fourth Schedule. The Schedule contains a Federal Legislative List and a Concurrent Legislative List. In the event of duplications in concurrent actions, the Federal prevail (Art. 143).
1.443. Federal development functions of particular importance in the development of the Metropolitan Area and the other parts of the Region include:

(a) agricultural programmes, including the Agroville programme, through the Food and Agriculture Division and Ministry for Production; Presidential Affairs, Culture, Town Planning and Agrovilles;

(b) industrial development with respect to which the Federal Government deems Federal control to be in the public interest (and, specifically, all undertakings, projects and schemes of the West Pakistan Industrial Development Corporation and other federal owned or controlled corporations);

(c) regional water resources and power development through the Water and Power Development Authority (WAPDA);

(d) the development and transmission of natural gas through the Sui Gas Transmission Company;

(e) nuclear energy initiated in the Karachi Nuclear Power Project through the Pakistan Atomic Energy Commission;

(f) the development of ports and ancillary works, such as port area roads and housing for port personnel, by the Karachi Port Trust and Port Qasim Authority;

(g) aerodromes and railways (in particular, the Karachi Civil Airport and Pakistan Western Railway);

(h) national highways, although their construction is usually undertaken by the Sind Highway Department and in some instances by the Karachi Development Authority in the capacity of agents;

(i) communication, through the Pakistan Telegraph and Telephone Department;

(j) Federal Government servants' housing, through the Public Works Department;

(k) tourist facilities, through the Pakistan Tourism Development Corporation;

(l) military, naval and air force works, including local self-government in cantonment areas, the constitution and powers within such areas of cantonment authorities, the regulation of house accommodation in such areas, and the delimitation of such areas through the Defence Division;

(m) higher education, through the Ministry of Education;

(n) major health facilities, through the Health Division.

1.444. Problems of Federal- Provincial conflicts in physical planning are minimized by operations of an integrated Federal-Provincial system for economic development planning, through which the major public investment decisions are processed.
The National Economic Council stipulates that each proposed public sector development scheme be scrutinized by and subject to the approval of a Provincial Development Working Party; and finally subject to review by a Central Development Working Party if the scheme costs Rs. 50 lakhs or more non-recurring, or Rs. 20 lakhs or more recurring.

1.445. The Sindh Planning and Development Department moves schemes through this process at the Provincial level, and puts together the Sindh components of the five-year plans and annual development programmes. The Development Commissioner, who heads the department, is Chairman of the Provincial Development Working Party. The department includes a Physical Planning and Housing Section, but its main function is evaluation of development schemes, not the initiation of comprehensive studies or plans.

1.446. The statutory foundation of the Master Plan Department of the Karachi Development Authority (KDA) is that the "... Authority may, subject to such directions as the Provincial Government may give, prepare or arrange for the preparation of such land use and Master Plans as may be required or such modifications thereof as may from time to time be deemed necessary." 2/

1.447. Other provisions of the KDA Order empower the KDA to impose land use controls within the area under its jurisdiction, presently co-extensive with the Karachi District. However, these provisions relate to specific types of control for the most part exercised in connexion with particular KDA development schemes in limited areas. It would be extremely difficult if not impossible for the KDA to promulgate comprehensive land use regulations for the District under the KDA Order as it now stands. With the exception of the preparation of standards for approving subdivision development, which have not been officially adopted, the KDA has not attempted to impose controls on an area-wide basis.

1.448. Based on enabling laws which seem to be in conflict with the KDA Order, the local governments in the Region may promulgate land use controls but have not done so. 3/

1.449. The KDA regulates building construction within the Karachi District, except in areas occupied by or under the jurisdiction of the Karachi Port Trust, cantonments and the Karachi Municipal Corporation (the "KMC").

3. Development

1.450. Development functions in the Region, as distinguished from planning and regulatory functions, are shared by the Provincial Government, Federal Government agencies, local

3/ Karachi Development Authority Order, 1957 (President's Order No. 5, 1957) (the "KDA Order").
4/ The Sindh People's Local Government Ordinance, 1972 (Sind Ordinance II of 1972), Schedule II (applicable to People's Municipalities) and Schedule III (applicable to People's Town Committees).
governments and special bodies. The Sind departments primarily concerned with development works are: the People's Rural Development Department; the Agriculture and Food Wing; the Department of Fisheries; the Animal Husbandry Department; the Irrigation and Power Department; the Communications and Works, Excise and Taxation and Jails Department; the Industries and Mineral Development Department; the Sind Industrial Trading Estate (S.I.T.E.); the Highways Department; the Sind Road Transport Corporation (Marachi Omnibus Service); the Education Department; and the Health, Labour and Social Welfare Department. The Communications and Works Department has general responsibility for provincial building projects such as the construction of housing for Government servants and Government office buildings, land reclamation, flood control, inland waterways and irrigation, historic preservation and other Provincial works schemes. The Housing, Town Planning and Local Government Department undertakes urban planning and improvement projects outside the Region. Its principal function in relation to development within the Region is the exercise of administrative control over projects of the KDA and municipalities.

1,451. The Sind Board of Revenue, through its Land Utilization Department, is peripherally but nonetheless very importantly concerned with land development in the Region in performing its function of promulgating rules for the allotment of government land for urban purposes.

1,452. Planning and land use control are relatively minor functions of the KDA. Its major activities are land development and the allotment of plots in urban expansion areas; housing in particular project sites; open plot development, the provision of bulk water supply, road construction in its own scheme areas or as agent for other government authorities in other areas and other types of town improvement projects.

1,453. There are two People's Municipalities in the Region: the KMC with an area of about 91 square miles and population of about 2.5 million; and the outlying Korangi-Landhi Municipal Committee covering about 100 square miles and having an estimated population of about 520,000 in 1969. Each is presently run by an Administrator appointed by the Provincial Government. The KMC's functions embrace those normally performed by a large city, including the construction and maintenance of local roads, parks, hospitals, primary schools and facilities for sewerage and water distribution. Major new development projects in the KMC are undertaken by the KDA as agent for the KMC, or within KDA scheme areas on land turned over to the KMC for the purpose. Building control and a number of basic municipal functions in the Korangi-Landhi Municipal Committee area, such as road maintenance and water supply, are still performed by the KDA.

1,454. Rural works programmes within the Region are administered by District Councils, which are currently superseded for all practical purposes by Deputy Commissioners for their Districts. Rural works planning and development in the Karachi District is under the supervision of the Provincial People's Rural Development Department, acting through a recently established District Co-ordination Committee.

1,455. The Sind People's Local Government Ordinance, 1972, already enacted but not fully implemented, calls for changes in the structure of government at the local level (see Section D, below).
B. SPECIFIC INSTITUTIONAL DEFICIENCIES

1. Lack of spatial plans and urban policies in Provincial economic development planning

1,456. The basic element of governmental activity planned and controlled by the system for economic development planning described above is the development scheme, project or programme. A development scheme often consumes large amounts of land (e.g., schemes for new housing, water resources development or industrial development). Sind does not have a mechanism for formulating provincial urbanization policies, nor an office for translating such policies into overall spatial plans, both of which should enter into the deliberations of the working parties in their review of development schemes.

2. Lack of a regional dimension in Provincial development planning

1,457. The Karachi Metropolitan Region exists only for the purpose of defining the scope of the current Project. It is not a political or geographic unit for capital investment budgeting. Pursuant to the Sind People’s Local Government Ordinance, 1972 (see Section D, below), all local governments operating within a substantial portion of the Region are to be consolidated and restructured into a federated system consisting of a Karachi Metropolitan Corporation with area-wide powers and six constituent municipalities. The ordinance plan has not yet gone into effect. Even when the Metropolitan Corporation begins to function, it would relate only to municipal development works and not include those sponsored by the KDA, other semi-autonomous bodies, or Provincial or Federal development departments operating in the Region. It is also unlikely that the boundaries of the Metropolitan Corporation would extend to the entire Sind portion of the Region.

3. The need for permanent intraprovincial and interprovincial agencies for integrated planning in the Region

1,458. The Master Plan Department of the KDA is confined largely to the preparation of a long-range plan to take effect in the future. It is not fully brought into the processes by which development schemes are prepared, reviewed and incorporated in the annual development programmes of Sind.

1,459. Part of the Lasbela District of the Province of Baluchistan lies within the Karachi Metropolitan Region, but as yet there is no legal support for a joint planning undertaking by Baluchistan and Sind. Legislative action is desirable to sustain a process of ongoing integrated planning in the interprovincial region and ensure faithful compliance with a Development Plan and its revisions.
4. Deficiencies in policy formulation relating to the distribution of public land

1.460. Karachi is dissipating one of its greatest resources for development, public ownership of possibly 80 per cent of the Metropolitan Area's developable land, through ad hoc, unplanned allotments of areas for both public and private purposes.

1.461. No institutional arrangements exist by which the distribution of this land can be guided by deliberate development policies and strategies. As a result, Karachi's urban growth up to now has been marked by varying gross population densities which are not systematically related to the levels of infrastructure provided or to the quality of housing, and considerable infrastructure investment has been made prematurely. This is evidenced by over 12,000 acres of unutilized land in low-density areas serviced at great cost by a water supply system, sewerage and roads, while thousands are in desperate need of space for shelter.

1.462. Government allots lands to private individuals or groups at low prices long before amenities are provided thereby encouraging rampant land speculation. Land costs to the ultimate residents are inflated. Capital gains resulting largely from public improvements accrue to private entrepreneurs, rather than to the public.

1.463. The Board of Revenue, acting through the Land Utilization Department, may lay down conditions for the allotment of state land for private purposes, as it did in 1971 in prescribing conditions for grants to co-operative housing societies in zonal scheme areas of the KDA. But the use of its powers appears to be sporadic; and in any event cannot be an effective instrument for ordering the location, pace and quality of development in Metropolitan Karachi unless the Board's determinations are made part of an effective planning process for the area.

5. The need for Federal legislative support

1.464. The major land developers in the Region are public agencies. Their development activities are not governed by a common set of policies or locational guides. Some share their plans with the KDA, the main control authority in the area. Others do not. Agencies answerable solely to Federal authority, such as Cantonment Boards, cannot be challenged by the Province or by the KDA in the absence of Federal legislation compelling their co-operation.

6. The need for an effective area-wide system for controlling private land development

1.465. Karachi has no effective area-wide system to private land use control. The law delegating regulatory authority to the KDA is deficient in a number of respects, notably in failing to provide a base for area-wide regulation. Zoning
regulations are promulgated on a scheme-by-scheme basis. In controlled areas occupied by lower-income groups, like Korangi, housing and living styles are generally incompatible with open space and floor-area-ratio rules, and the law is simply ignored. Even for pucca construction the written floor-area ratios and building height limits are not compatible with contemporary KDA thinking or practice. Restrictions against illegally-located commercial uses of nuisance activities are generally meaningless because KDA lacks resources for effective enforcement. Town planning regulations applicable outside of KDA scheme areas have been reduced to writing but not officially adopted, hence cannot be enforced.

1,466. It is estimated that 40 per cent of the holders of no objection certificates deviate from approved plans. With illegal structures are discovered the KDA sometimes waives the violations in return for a disclaimer of compensation for the improvements in the event Government decides to appropriate the land in the future. These "no compensation" agreements are of questionable validity and detrimental to the entire enforcement effort.

1,467. KDA has only eight field inspectors to enforce its town planning control regulations throughout the Karachi District. The enforcement of development controls is divided between that staff and about 25 building inspectors in KDA's architectural control unit.

1,468. Another problem is the multiplicity of agencies participating in the processes of public land allotment (e.g., the KMC, the KDA, the Deputy Commissioner of the Karachi District). Leases restrictions on the use of land, which are imposed by each of these authorities, must be reconciled with land use regulations. Discrepancies have arisen in the past, which have created difficulties in the enforcement of uniform land development policies in particular areas.

1,469. There is a lack of legislative support for effective interim regulation of private land development. Article 12 of the KDA Order is simply a prohibitory measure, to be used for temporarily freezing development until decisions have been made for planning the areas and subjecting it to permanent use regulations. It has not been a useful device in the past and could not be invoked as a stopgap measure for the whole of the undeveloped Karachi District. Development cannot be frozen everywhere for the next decade or so.

1,470. The framing of "zonal plan schemes" under Article 40 of the KDA Order for selected areas has had little success in restraining private initiative pending the KDA's acquisition and development of such areas. Vague development

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3/ E.g., KDA Order, Article 39, relating to town expansion schemes, and Article 37, entitled "Development Scheme" but confined to the protection of street alignments and building lines of projected roads or streets. Article 40, headed "Zonal Plan Schemes", has been resorted to on a few occasions as a method of freezing development in specified areas pending their acquisition by the KDA for its development purposes. Area-wide subdivision control is based on Article 79, which requires permission for the laying of new private streets and covers only a few details of the proposed developments;
Intentions on the part of KDA, brought to fruition (if ever) only after years of waiting for Government fiscal and technical approvals, give way to pressures dictated by the faster-paced dynamics of the private land market. In any event the zonal plan scheme is limited to specific development objectives and could not provide legal support for an effective area-wide system. Statutory revision is needed.

8. Lack of mechanisms for rationalizing land development decisions of public agencies

1.471. Different types of governmental decision influencing development make it virtually impossible to plan for orderly development of one area in relation to a plan for the whole community or for an orderly pacing of development and control densities. Federal agencies are not subject to any planning or building control of local authorities or the KDA. Nor are the Provincial agencies responsible for action on land allotment, changes of land use or the provision of Provincial buildings and highways.

1.472. Mechanisms are lacking by which the mutually-affected public interests may be negotiated to reach solutions well-related to overall community goals. It is unrealistic to expect most of these decisions to be made in advance in the form of an overall Development Plan.

9. Lack of institutional arrangements by which Government planners can interact with the citizen clientele

1.473. Karachi has witnessed more than one episode of rejection of a Government project by the intended users, simply because it was incompatible with their needs. This can and should be avoided by more purposeful dialogue between planners and the concerned public.

10. Deficiencies in the delegation and exercise of building control powers

1.474. The Sindh People's Local Government Ordinance, 1972 and KDA Order contain conflicting delegations of building control powers to the municipal governing bodies and the KDA, respectively. In practice the problem has been resolved by the KMC's adoption of the 1971 building regulations issued by the KDA, and an informal directive of understanding under which the KMC administers the regulations within its own limits and the KDA administers them elsewhere in the Karachi District (except in cantonment areas in each case).

1.475. The regulations are largely ignored in the vast areas of the Region occupied by squatters, by former squatters whose holdings have been regularized, by home-owners in open plot developments sponsored by the Government itself, and even in resettlement areas like Korangi with respect to buildings initially constructed by Government but later restructured by the owners to suit their individual living styles and needs. Given the extreme variations in dwelling types in Karachi, if building regulations are to be applied everywhere, different standards must be established for the kinds of dwellings built by lower-income residents.
1.476. Building regulations sometimes overlap KDA's zoning requirements and conflicts result. The KDA has separate enforcement staffs for town planning control and building control but lacks adequate staff to police building construction, as noted earlier.

11. Outdated and inadequate enabling provisions governing KDA's improvement schemes

1.477. Section 33 of the KDA Order empowers the KDA to frame a "rebuilding scheme" providing for the reservation of streets and open spaces, acquisition and clearance of land, demolition or reconstruction of buildings by the owners or by KDA, and the laying out of patterns of redevelopment. There are not specific provisions for contracting with private developers to undertake the renewal phases of a project, thus no statutory safeguards for protecting the public interest in the making and implementation of such arrangements. Nor does the statute contain precise provisions safeguarding the interests of dislocated occupants of a renewal area.

12. The need for a realignment of the functions of the KDA

1.478. The KDA's fiscal and staff resources have been allocated among a variety of functions over the years: road construction, widening and maintenance; housing construction; land development for urban expansion or the provision of colonies for displaced persons; the development of parks and other recreational facilities; the construction of water supply, sewerage and drainage works; the provision of bulk supply and in some areas the retailing of water to consumers; various land management functions in KDA schemes remaining under its jurisdiction; building regulation and enforcement; town planning control; and comprehensive planning for the Region.

1.479. The KDA is understaffed in senior personnel in a number of its departments. Problems of administration have been compounded by the multiplicity of the agency's responsibilities. As the KDA is burdened with more and more land development and detailed planning tasks emanating from planning proposals of the present Project, tasks will increase both in magnitude and complexity as well as in geographical coverage. If KDA's concerns should be extended beyond the borders of the Karachi District, these problems are bound to be exacerbated. A substantial realignment of some of its functions appears to be called for.

C. DEFICIENCIES IN PLAN IMPLEMENTATION AND URBAN MANAGEMENT

1.480. Substantial improvement in project execution and urban management is essential. There is a real and present danger of major physical breakdown and serious social conflict if public machinery for project execution and the management of essential urban functions is not put right.
1,481. The capacity for construction is impressive for some urban facilities and functions, including the port, the airport, the railway, major highways, bulk water treatment, trunk sewers, electricity and gas. But for others, notably water distribution, sewage treatment, local sewers, drainage, refuse disposal, public transport, education and health, operations and maintenance are so deficient that they threaten the continued existence of the City. There is a desperate shortage of management skills. It must be recognized that construction is relatively simple and remunerative, whereas operations and maintenance require permanent skilled staff groups that will persevere under very difficult conditions. Moreover, it is difficult to make operations and maintenance, particularly in the public sector, remunerative for either enterprises or individuals when they are serving a predominantly low-income population.

1,482. In the rest of the Region, outside the Metropolitan Area, there is a less urgent but substantial need for organizational improvement in programmes for water resource development, agricultural development, industrial development (including support for small-scale industry) and communications and recreation.

3. THE SIND PEOPLE’S LOCAL GOVERNMENT ORDINANCE, 1972

1,483. The Sind People’s Local Government Ordinance, 1972 (Sind Ordinance No. 11 of 1972 modified up to 29 August 1977) is intended to consolidate and amend laws relating to local government, provide for the constitution of People’s Local Councils in the Province of Sind and provide for the creation of a metropolitan level of government for Karachi.

1,484. These objectives are, indeed, desirable, particularly when it is remembered that the population of the Karachi Metropolitan Area is already larger than some national populations. The fragmentation of planning and development responsibilities has seriously hampered the sound growth of Karachi, just as it has hampered the sound growth of metropolitan areas in many parts of the world. However, the Ordinance in its present form still leaves a number of problems to be dealt with.

1,485. The 1972 Ordinance may result in five major units of government: the Metropolitan Corporation; the People’s Municipalities; People’s Town Committees (for example, if a town committee is established for the new Steel Mill Township); People’s District Councils (if some of the localities within the Metropolitan Area are still considered to be "rural") and the Cantonsments (see Para. 8, Sub-para. (2)). The membership provided for in the Metropolitan Corporation and the People’s Municipalities, of which there are to be six, may be cumbersome. The Corporation is to have 30 members and each Municipality is to have 30 members.

1,486. Some key urban functions are still left dangerously fragmented. Responsibilities for water supply and sanitation, for example, may end up being shared among at least twelve distinct entities (the Corporation, six Municipalities, the Cantonment Board(s), the new Steel Mill Township, the Karachi Port Trust, the new Port Qasim Authority and S.I.T.R.).
1,482. The fiscal structure proposed would have many of the undesirable features of the existing situation. There would still be heavy dependence on the octroi and there seems to be provision for multiple applications of the same kinds of taxation. The resultant tax structure is likely to be insufficient in its yield, regressive, easy to evade and difficult and expensive to administer. A provision for the exemption of one-third of the tax on property lying vacant or remaining unproductive for a period of more than two months (Para. 71) is of very doubtful merit; it may well encourage a continuing underutilisation of urban land.

1,483. Penalties for offenses against local regulations such as building codes probably are too small to be effective for major offenders (imprisonment up to three months and/or a fine of Pkr.1,000 in a municipality or town committee and a fine of Pkr.200 in a People's District Council). Although there is provision for the removal of encroachments, this, as in the past, is likely to be very difficult to enforce.

1,484. Provision is made (Para. 2) for the selling of grant- ing of public land to private entities. Since Karachi is one of the few great metropolitan areas in the world in which much of the land is still under public ownership, this provision seems to encourage, rather than discourage, the abandonment of an extremely valuable instrument for the guidance of metropolitan growth.

1,485. These and other features of the Ordinance appear to call for careful scrutiny and, possibly, amendment, before the Ordinance is fully implemented.

E. RECOMMENDATIONS

1,491. Some of the organizational changes necessary for the operation and maintenance of individual urban functions have been identified in the chapters dealing with sector programmes. It has been stressed that a number of those organizational changes are vital to the very survival of the City. They are even more urgent than the need for institutional improvements in policymaking, planning and development control. But, just as long-range planning is of little use if the necessary implementation capacities do not exist, so highly-developed executing capacity in individual agencies is of only limited value if those agencies do not operate in an institutional framework which makes it possible to establish and maintain sound planning. That framework should facilitate the establishment of a perspective for day-to-day operations and encourage collaboration among the multitude of public agencies and private groups whose participation in the planning, operation and maintenance of the Metropolitan Area is essential. The purpose of this section is to recommend such an institutional framework.

1,492. The machinery for the type of integrated planning and development that is needed can operate effectively only if it is situated at the places where major public investment decisions and their underlying social, economic and spatial policies are made, and where leverage is applied to control the implementation of those decisions. In the case of Karachi, the key decisions are made largely by the Federal and Provincial Governments. Federal authority must be legislated to serve the needs of planning for the Karachi
Metropolitan Region. Federal legislation is required to ensure participation by the Cantonment Boards and other Federal bodies in that planning and in the development of an instrumentality for making and carrying out plans of interprovincial concern in the Region. Provisional legislation is needed, similarly, to secure the co-ordinated participation of provincial and local agencies in the development of the Region. Local bodies will play an increasingly important role in that development, particularly if the Sind People's Local Government Ordinance, 1972 (or an amended version of that Ordinance) is put into effect.

1. Overall organization for planning and development in the Karachi Region

1.493. The overall structure for integrated planning and development in the Region should be based on four mechanisms: a high-level federal body concerned with aspects of regional planning and development having federal implications; an Interprovincial Karachi Region Planning and Development Committee (called here simply the Interprovincial Committee) dealing with aspects of regional planning and development having interprovincial implications; a mechanism for dealing with planning and development outside the Karachi Metropolitan Area in that part of the Region that is in Sindh; and the Metropolitan Planning and Development Committee recommended in Chapter IV for planning and development in the Karachi Metropolitan Area. Federal planning and development concerns, interprovincial concerns and planning and development outside the Metropolitan Area in that part of the Region that is in Sindh will be dealt with very briefly before focusing attention on the Metropolitan Committee which is the principal and most urgent concern.

1.494. The development activities of federal agencies, such as those responsible for ports, cantonments and other defence areas, railways, aerodromes and power production and supply, occupy large blocks of land and strongly influence development patterns in the Region. The Federal legislature has exclusive authority to provide for effective participation by such agencies in planning for the Region.

1.495. Under the proposed Federal Urban and Regional Planning Act, federal agencies such as Cantonment Boards would...


be urged to enter into intergovernmental planning agreements with provincial planning agencies and the Metropolitan Committee with respect to their mutual development problems. Provision is made also for a high-level federal body (with provincial representation) to impose a collaborative system on the parties and resolve any conflicts arising from the operation of that system. There is a provision for federal legislation which would authorize provincial and local planning agencies to include within their plans, areas under the jurisdiction of Federal government departments or bodies, if approved by a central Federal planning organization established by the legislation. Plans so endorsed would be binding on the land development activities of the affected Federal departments or bodies.

(b) Interprovincial planning concerns in the Region

1,496. Part of the Region is in the Lasbela District, located within the Province of Baluchistan. Legislation by both provincial Governments would be desirable, although it might not be necessary, to support an intergovernmental agreement for collaboration in formulating regional planning policies of mutual concern.

1,497. The Federal Government's interest would automatically attach by reason of the interprovincial character of the activity, but, in any event, the immediate interest of central development agencies (e.g., NAPDA) would certainly be involved in such policies. Accordingly, the Federal Government should be a party to the agreement, and for that purpose federal legislative action is indicated. The proposed Federal Urban and Regional Planning Act provides for this. An Interprovincial Committee representing the Sind and Baluchistan Provincial Governments and the Federal Government, with the Metropolitan Planning and Development Committee represented explicitly in addition to any other representation the Government of Sind may have, should be established to deal with those aspects of regional planning and development that have interprovincial implications. The Chairman of the Interprovincial Committee could be a High Federal Government official appointed by the President of Pakistan, with the concurrence of the governors of both provinces. Representatives in the Committee would submit to their respective Provincial Governments advice on matters of interprovincial concern.

(c) Planning and development outside the Metropolitan Area in that part of the Region that is in Sind

1,498. Planning and development outside the Karachi Metropolitan Area in that part of the Region that is in Sind would be undertaken by the Local Self-government, Town Planning and Housing Department, Sind and/or other provincial agencies, depending on the scope of the planning and development involved. For some purposes the Provincial Government might and should assign extraterritorial planning and development powers to the Metropolitan Committee. The federal entity(ies) concerned with planning and development in the Region, the Interprovincial Committee and the Metropolitan Committee all should be consulted in matters affecting their interests and have the right to respond as they deem appropriate, as provided for in the draft Federal and Provincial acts. They also should have the right to initiate requests for planning and development relevant to their
Planning and development in the Karachi Metropolitan Area

1,499. Integrated planning and development in the Karachi Metropolitan Area should be the responsibility of the Metropolitan Planning and Development Committee recommended in Chapter III. The Committee should consist of officials representing the important Federal, Provincial, local and possibly private decision-making entities that affect the development of the Metropolitan Area. The new local bodies proposed in the Sind People's Local Government Ordinance, 1972 would be represented in the Committee as soon as they are established.

1,500. Because their establishment may not take place for some time, a high-level interim committee should be created immediately to guide and co-ordinate planning and development in the Metropolitan Area. That interim committee should also be responsible for planning and development in the rest of the Region that is in Sind, pending the establishment of permanent government arrangements for that purpose. The interim committee would be created by reconstituting the present Policy Advisory and Steering Committee for National Pilot Project No. 1. This interim device would, among other things, provide an experimental base for arriving at an appropriate definition of the membership and functions of the permanent Metropolitan Planning and Development Committee. The following recommendations are made with this in mind.

Chairmanship and membership of the interim Committee

1,501. The interim Metropolitan Planning and Development Committee should be given high status by having the Chief Minister, Sind, as its Chairman. Its membership should include: a high official of the Federal Government, such as the Federal Minister for Law, Education and Provincials Coordination; the Ministers of relevant Provincial Departments (including the Minister for the Housing, Town Planning and Local Government Department, the Minister for Finance and the Minister for Planning and Development); appropriate Federal Secretaries or Joint Secretaries, including the Joint Secretary, Town Planning and Agro-ville; appropriate officers of secretarial rank in the Provincial Government, including the Additional Chief Secretary (Development), Government of Sind; the Director General of the Karachi Development Authority; the Chief, Physical Planning and Housing, Planning Commission, Government of Pakistan; and the Director of Planning in the Master Plan Department, KDA. If the Committee is to be responsible also for guiding planning and development that is interprovincial in the Region, its membership should include a high official of the Government of Balochistan such as the Additional Chief Secretary (Development).

These recommendations have since been adopted through their endorsement by the Chief Minister, Sind and the reconstituted Policy Advisory and Steering Committee has been established.
[II] Functions of the Interim Committee

1.502. The Interim Committee should undertake the basic planning and development guidance functions that eventually are to be assumed by the permanent Metropolitan Planning and Development Committee, using the staff of the Master Plan Department, KDA, supplemented as necessary, as its staff group. Those functions should include the following:

(a) The Committee should use the Karachi Development Plan, 1974-1985 as a basis for its collaboration with Federal, Provincial and local agencies and the private sector in guiding Metropolitan and Regional growth. The Committee should also be responsible for updating and maintaining the Plan as part of a continuing planning and development process. The Committee should undertake or have undertaken the surveys and other studies necessary for the maintenance and development of the Plan. The Plan should be maintained in such a way as to deal with the essential demographic, economic, social, physical, administrative and financial aspects of development and the legal framework necessary for sustained planning and development.

(b) As part of its continuing planning responsibility, the Committee should prepare annual and five-year capital investment programmes for the Region to be incorporated in the Provincial Annual Development Programmes and Federal Annual Plan and five-year plans. To enable it to perform this function the Committee should be empowered to obtain necessary budget and other data from the relevant agencies.

(c) As part of its concern with the financing of development the Committee should establish or participate in the establishment of appropriate standards for the levying of property taxes, leasehold, betterment and other charges associated with land use in the Region.

(d) The Committee should establish guidelines for the allotment, leasing or other disposition of public lands to public and private users in the Region and for the acquisition and disposition of private lands in accordance with the Development Plan.

(e) The Committee should be responsible for annual reviews of public and private policies, plans, programmes and schemes in the Region and for the preparation of annual progress reports on regional development and the status of the Plan's implementation; these reports should be submitted to the Provincial and Federal Governments with the Committee's recommendations for the action necessary to facilitate the Plan's implementation.

(f) For development proposals not dealt with explicitly in the Plan, the Committee should be empowered to establish Planning Positions regarding the feasibility, location or any other features of a particular public or private development scheme, project or work which, in the judgement of the Committee, may have important implications for planning under its jurisdiction but with respect to which no approved Regional Plan or other development plan duly sanctioned by Government authority, explicitly or implicitly, provides adequate guidance or direction. A Planning Position should be able to be cited in support of the Committee's review or regulatory actions. The statement of a Planning Position
should include a statement or summary of the findings and reasoning on which it was based, and shall be recorded, registered, filed and published in such manner as may be prescribed.

(g) The Committee should provide for proper public participation in the continuing preparation and review of the Development Plan for the Region.

(h) The Committee should prepare or have prepared the regulations necessary for the implementation of the essential features of the Development Plan and should supervise the enforcement of those regulations.

(i) The Committee should be responsible for the establishment and maintenance of a metropolitan data system to acquire, process, store and disseminate the statistical data and other information necessary for its planning and regulatory functions and for the support of other public and private action in accordance with the Development Plan.

(j) The Committee should be authorized to provide planning and other assistance to local bodies or other entities to facilitate the implementation of the Development Plan.

(k) The Committee should be authorized to undertake or support technical training and other responsibilities necessary for sustained planning and development.

2. The role of the KDA

1,503. Under the 1972 Ordinance the KDA would be absorbed into the Karachi Metropolitan Corporation. In the meantime, pending the establishment of the Corporation, the detailed physical planning, land development and infrastructure activities of the KDA should be guided by the interim Metropolitan Planning and Development Committee.

1,504. Organizational changes should be made to enable the KDA to concentrate its efforts on the preparation of detailed plans for land development and the construction of appropriate infrastructure. Its management skills should be focused on this one major function, its objectives should be limited, and its financial resources should not be diffused.

1,505. It would be in a better position to support a steady flow of urban land to all user groups, thereby reducing land speculation and distortions in land pricing policies, than if it continued to regard land development as merely incidental to ad hoc scheme proposals with a variety of specific objectives, such as housing, road widening and the building of parks.

(a) Detailed physical planning

1,506. Detailed physical planning as distinct from metropolitan planning would continue to be a function of the KDA in the office of the Chief Town Planner and Architect, but this function is incidental to its land development functions. To the extent they applied to specific locational or other matters before the KDA planners, the policies and plans endorsed by the interim Metropolitan Committee would have to
be followed: and, in case of doubt, jurisdictional gaps would be filled or conflicts resolved by the Committee. For example, the KDA would prepare a detailed land use plan for the sub-area. The detailed plan would be submitted to the Metropolitan Committee's staff for review to ascertain its fidelity to the Karachi Development Plan, then to the Committee for sanctioning.

(b) Land development

1507. The KDA’s land development operations, guided by the Metropolitan Committee, would be funded from the substantial increases in land values and land revenues that will be associated with urban growth generally and with the land improvements installed by the KDA specifically.

1508. KDA should no longer participate in the current practice of distributing land at bargain prices to groups of individuals who pocket the profits of the rising market.

1509. The operation of water supply systems, the maintenance of sewer systems and other public facilities, the construction and operation of housing projects and other activities that drain off KDA’s fiscal and management resources and make it impossible for Government (through the KDA) to retain the benefits of land inflation, should be left to other public or private entities. At the very least, this would suggest the creation of a separate metropolitan-wide authority devoted to the development and operation of facilities for water supply, sewerage, drainage, river management and refuse, as proposed in Chapter III. The KDA’s involvement with these functions would end once it completed the installation of water, sewer and drainage facilities within its development projects (assuming these responsibilities were not transferred to the new water and sanitation authority). The investment in this part of infrastructure development would be recouped in the process of the “wholesaling” of land to consumers or to organizations which would do the land “retailing”.

1510. As indicated above, the KDA’s detailed planning function would be keyed to its land development activities, which in turn would be guided by planning decisions emanating from the Committee.

(c) Regulatory powers

1511. If this shift in function were made, KDA’s current responsibilities for District-wide land use control, including its role in issuing its “no objections” clearances for allocations of public land made by other Government authorities would be shifted to the Committee for broad regulation, and other agencies such as the KMC for detailed regulation. The selection of agencies to assume detailed regulatory responsibilities will depend on the development of administrative capabilities within the various units of local government evolving from the reorganization proposed under the 1972 Ordinance.

1512. The lack of specificity in the present assignment of rebuilding powers to the KDA has been noted, and the need to up-date its enabling act to meet the problems of urban renewal under contemporary conditions has been indicated.
1.513. Other statutory provisions relating to the KDA's land development functions are also ripe for re-evaluation in the light of the role projected for it (or for any successor agency like the Karachi Metropolitan Corporation). The KDA Order's classification of schemes and the different sets of procedures prescribed for framing them are obsolete, confusing and fraught with legal problems.

3. Regulatory instruments

1.514. The range of instruments essential for carrying forward the Metropolitan Development Plan include positive public developmental actions of far greater significance than the exertion of regulatory or negative Governmental authority. The successful implementation of physical, social and economic development programmes for enhancing the Metropolitan Area and improving the standard of living of its people will have immeasurably greater impact on the future of the Region than the effacement of building and planning control laws.

1.515. The regulation of physical development nevertheless has an important part to play in achieving the implementation of the Plan. It will be dealt with here under four headings: the distribution of public land resources; the coordination of public land development; control of private land development; and the curtailing of land speculation.

(a) Distribution of public land resources

1.516. Approximately 80 per cent of the developable land in the Metropolitan Area is in Government ownership. The problem of allocating public land at the right time and for the right purposes is one of administration, not of police power regulation.

1.517. Weaknesses in the existing system for public land distribution are revealed in recent episodes in the history of KDA's Scheme 33, discussed earlier in this Report. Pressures for leases of Government-owned land in the undeveloped suburbs of Karachi resulted in the formation of an ad hoc committee of Government Ministers to select among housing co-operative societies competing for Scheme 33 plots. The mere fact of the creation of this high-level committee indicates that neither the KDA, nor the Co-operatives Department, nor the Board of Revenue was appropriately constituted or suitably located in the Government hierarchy to perform this task.

1.518. The policy judgements involved in dispensing Government's land wealth are too important and complex to be made by any one agency with a narrow functional perspective.

1.519. There are multiple facets to the land allocation function. Contributions are required from different agencies with a variety of interests. A highly-placed governmental unit must be vested with the ultimate responsibility of ensuring a rational and equitable allocation of Karachi's land resources. A critical dimension is missing from the existing system -- one that can be supplied only by the kind of interagency and intergovernmental policy unit previously recommended.
1.520. In the Scheme 31 situation the allocation function appears to have been treated essentially as one of passing on the leadership, membership and needs of the competing co-operative housing societies. Consideration should be given to more important factors, including (among others) the question of whether the timing of the allocation was appropriate, the question of whether the plot sizes and other developmental features proposed are well matched with the occupational and other socio-economic characteristics of the society members, the financial capacities of the societies to plan for and construct housing in step with the pacing of public infrastructure development, and governmental capacity to provide the transportation, utility, educational and other services and amenities that will be needed.

1.521. If the Metropolitan Planning and Development Committee is established it will have a different sequence and procedure for decision-making in public land distribution. The Committee's staff would propose and the Committee would pass on rules for the allocation of state land in accordance with sanctioned development policies and plans. These would be correlated with and perhaps incorporated in land development regulations. The rules would have a time dimension to prevent premature distribution to land speculators. By reference to general integrated development plans, or to detailed land use plans where available, the rules would describe those zones in which allocations may not be made until certain events occur, such as the completion of infrastructure development or completion of detailed land use plans for the area in question.

1.522. A development project on the scale of Scheme 31, for example, should be phased over a long period of time taking into account the real demand for construction sites (as distinguished from a clamour for land rights to be held indefinitely, for speculative purposes) and the time and resources required to prepare land for settlement. Some areas might, accordingly, be designated and mapped as holding zones in which allocations may not be made until formal notifications announce their readiness for construction.

B. Co-ordination of public land development

1.523. A land use control system should not treat public and private development alike in framing zoning and subdivision regulations. The institutional arrangements suggested for formulating development policies and reviewing proposed development schemes would provide a much more realistic method of rationalizing land development decisions in the public sector.

1.524. The various public agencies, directly or through their administrative departments, should participate in a process of negotiation, collaboration, and accommodation leading to the adoption of policies shaping their development activities to the Development Plan (or modifying the Plan to conform to their reasonable requirements).

1.525. The specifics of such policies should appear in the form of guidelines for public development incorporated in or emanating from regional-scale integrated development plans or detailed physical plans.
1.526. The Metropolitan Planning and Development Committee should be the sanctioning authority for the regulations and guidelines and an appellate forum for Provincial and local agencies dissatisfied with their contents or application. Conflicts between Federal agencies and the regulating authorities should be referred to a Federal body for resolution, if one were established through Federal legislation.

1.527. A public development reporting procedure should also be instituted. It would require that every public development scheme or project (e.g., of the KMC, KDA or Sind Public Works Department) costing up to a specified amount be reported to the Committee before construction begins, as a means of keeping the Committee informed regarding the progress of, or departure from, the Development Plan.

1.528. These concepts of predetermined development policies, collaboration by public development agencies in the integrated planning process, the mediation of intergovernmental conflicts, active participation by the Metropolitan Committee in the operations of the Provincial economic development planning system and the development and operation of a central planning information system have all been incorporated in the Model Provincial Urban and Regional Planning Act and the proposed Federal Legislation.

(c) Control of private land development

(i) A new planning law

1.529. New enabling legislation should be enacted by which deficiencies in the existing development control system can be corrected. The new law should establish a system with the following features:

(a) Flexibility in the allocation of powers. The Provincial Government should be given discretion to delegate appropriate aspects of development control powers to appropriate planning or other authorities. Initially, exclusive power to issue land development regulations might be vested by statute in the proposed Committee. By delegation, and with the approval of the Committee, local agencies like the KDA performing detailed physical planning functions would be given the right to frame their own precise regulations subject to general standards imposed by the Committee. Specified administrative and enforcement responsibilities should be assigned to lower echelon authorities. An analogy is suggested in the grant of authority by the Sind People's Local Government Ordinance, 1972, to the Karachi Metropolitan Corporation to promulgate building regulations and the assignment to the People's Municipalities of the responsibility to administer them.

(b) Flexibility in the choice and application of regulatory techniques. The regulatory authorities should be free to impose some controls on an area-wide basis, others on a zonal basis. The enabling provisions would be sufficiently precise to confirm their power to use a wide variety of tools suitable to contemporary modes of development, such as:

- Subdivision controls under which private developers could be made to dedicate land for public purposes, or give cash in lieu thereof;
- Land reservation provisions for protecting rights-of-way for projected highways, which would in turn protect private owners from confiscation of their rights;
- Special zoning of large-scale developments.
(c) Public participation and procedural safeguards. In order to ensure public confidence in the control system and protect the constitutional rights of property owners, procedural safeguards should be applied to the making of development control determinations involving an exercise of official discretion. The procedures should invite public participation through requirements for public hearing, serving the additional purpose of acquainting the authorities with attitudes of the affected publics, and the realities of enforcement.

(d) Regulation of development in Provincial and national control areas. Through complementary Federal legislation, the system should enable the Provincial and Federal Governments to supersede existing local authorities for the purpose of protecting Provincial or Federal installations or investment against uncontrolled peripheral development. This power would be more pertinent in areas of Sind outside the Karachi Metropolitan Region. The foregoing features are found in the Model Act and proposed Federal Act.

(iii) Building controls

1.530. The adjustment of building construction standards to varying types of lower-cost dwellings could be made on a zonal basis, using appropriate criteria to apply different levels of requirements to different areas or development clusters. Conceivably the criteria might take into account the nature, history and cost of the original construction, current reconstruction costs, the existing layouts, the nature and quality of various public improvements or services available to the occupants, and minimum environmental standards established by health authorities. The revised regulations should also provide a method for dealing with pucca structures scattered among kutcha dwellings to prevent the perpetuation of slums or near-slum conditions. The overlapping delegations of building control powers to municipal governments and the RDA in its present role should be corrected and should be made subordinate to general development standards prescribed by the Metropolitan Committee.

(iii) Enforcement of land use controls

1.531. The staggering dimensions of the enforcement problem require innovative techniques to be devised and tested, such as the focusing of severe controls on critical areas and the establishment of only modest controls elsewhere, together with the use of a task force in randomly selected areas to spot check and educate the public to the seriousness of Government intentions. The RDA practice of waiving violations should be terminated.

(iv) Interim controls and interim legislation

1.532. The preparation of the present Project’s Development Plan is sometimes offered as a reason for making RDA’s general subdivision standards official and legally binding. They were prepared in 1963 as “interim” regulations. It should be understood that the regulatory process must be as flexible as the development process itself and that a properly working control system frequent amendments of regulations may not only be inevitable but also desirable. Repealed planning legislation should be enacted early. Supported by new and adequate legislation, interim controls
should be promulgated forthwith. They should reflect revisions of KDA's current detailed physical planning standards based on the deficiencies already identified as well as development standards suggested in the Development Plan prepared in the present Project.

1.534. The realities of the processes for legislation and administrative reorganization make it highly unlikely that a comprehensive planning law will be fashioned and adopted quickly. As an interim measure the staff of the present Project, with active participation and important contributions by the Law Officer of KDA, have drafted an amendment to the KDA Order which would correct the major deficiencies in the existing statutory provisions for regulating private land development in general, while enabling the KDA to promulgate needed stop-gap regulations.

1.535. Under the proposed amendment, in lieu of issuing venue directives stopping all development without prior approval, as in the existing Article 12 of the KDA Order, the proposed Metropolitan Committee, the KDA in its new role, and other entities that may be given regulatory responsibilities, would resort mainly to subdivision control powers. These would be given a firm legal base through the enunciation of predetermined standards to be applied in passing on individual applications. These standards would reflect recommendations incorporated in public plans and programmes which have been proposed by or are compatible with the recommendations of the present Development Plan.

1.536. The proposed regulations might be called the "Karachi Interim Subdivision Control Regulations". The courts may be more willing to uphold the regulations in such situations if they are seen to be temporary in nature. Regulations that threaten to wipe out private land investments for all time would not hold up under judicial attack.

1.537. The regulations should do much more than set out the types of general area and amenity requirements found in a set of subdivision standards informally adopted by the KDA staff in 1965, but never Gazetted. These were intended to apply to permitted development. The subdivision regulations here suggested should have their own built-in spatial and time dimensions in the absence of a comprehensive zoning map on which to rest them.

1.538. They might incorporate the time factor by reference to "development time zones". In other words, the staff of the Metropolitan Committee might overlay a time map on the undeveloped part of the Metropolitan Area (and the Region, if the Committee is responsible for the entire Region), with different colours showing the different phases in which development may be allowed, with the development dates specified together with the zones in which development may be prohibited indefinitely.

1.539. An "almost ready" zone might be one in which a sketch of communications and service lines and major use allocations is shown, although it may have insufficient detail to count as a zoning plan. In such areas applications for subdivision and development permission might be confined to large-scale projects for which comprehensive plans would have to be worked out in collaboration with, or with the approval of, the Metropolitan Committee.
1,539. The subdivision approval would in effect produce an agreement with the developer stipulating the conditions, but also fixing ground rents, premiums and development charges. The amounts of these payments should be based on a formula calculated to discourage private land speculation at Government's expense.

1,540. The system outlined would be especially appropriate for areas included in urban expansion projects where the private developer already owns or holds a lease on the land. There is no good reason why the problem of ripeness for development should arise where the land remains wholly in Government ownership.

1,541. In current practice this fact seems not to be fully appreciated. A co-operative housing society or other prospective developer applies to the Deputy Commissioner or other authority for a lease. Generally the applicant is routinely referred to the KDA for a preliminary no-objection certificate "from the town planning point of view". The mere fact of the referral gives the applicant an expectation of affirmative response unless the KDA assumes the burden of rejection. Inasmuch as the practice also includes the ritual of granting provisional development permission, with the understanding that KDA must later approve the developer's site plans, it becomes all the more difficult to reject the proposed development as being premature. The granting of the initial no-objection certificate is tantamount to free admission to the land speculation game.

1,542. A reverse procedure would be more compatible with Government's objectives of discouraging premature development and land speculation. The Metropolitan Committee or the KDA should designate holding areas in which state land could not be converted to private urban uses. This type of understanding was reached by various authorities recently regarding the retention of land in the area of the Port Qasim Authority's project, pending further planning for the area.

1,543. The primary reason for inclining public lands in holding areas is to put Government authorities in a better position to resist pressure groups seeking allocations. The justification would be their relationship to the overall economic and population growth portrayed in the Development Plan and the absence of detailed physical plans. Other reasons, with respect to particular areas, would relate to such circumstances as the unsuitability of the topographical or ecological features of the land for development, or some expectation that major portions of the land may be devoted to community uses. Government development projects in holding areas would be allowed if compelled by an overriding public interest, and then only on conditions negotiated by the Metropolitan Committee with other concerned public agencies in the course of an ongoing planning process.

(d) Measures for curtailing excessive land speculation

1,544. Effective implementation of land allocation rules and interim controls pending detailed physical planning, along the lines suggested above, should militate against the practice of holding allotted land for speculative purposes. By establishing market prices for public land, an important
step will be taken to eradicate the major evil of land speculation and the siphoning off by a small private segment of the community of the land profits belonging to the people.

1,545. One device for correcting this social inequity would be to include in the price of Government's lease to the private developer a factor representing a projected increment in the market value of the land resulting from Government's planning and development of the area. This might be incorporated in the types of subdivision of the area. The added charge might be made payable over time to ease the burden of homeowners or other land users. A mechanism should be developed using a process of arbitration by which this incremental factor could be adjusted upward or downward to specified limits within a specified period of time (or at a future time, possibly fixed in reference to the completion of stated infrastructure or community improvements, or the reaching of a specified percentage of full occupancy of the developed area).

1,546. The added cost would be borne by the ultimate occupants, no matter what method is used to recapture the profits for the public treasury. But the potential profits of speculating middle-men would tend to be limited by pushing the "wholesale" price up toward a market figure. The current practice of charging fees for transfers of plots allotted by the KDA yields only a fraction of the increment to the community. The major profiteer is the original allottee because of the low price fixed in the first instance.

1,547. The usual requirement that the allottees of residential plots construct their homes within a given period of time, normally two years in KDA practice, is obviously related to the problem of land speculation. The existing sanction of a 3 per cent non-utilization fee chargeable under Section 112 of the KDA Order has not been effective. Two corrective actions have already been suggested in housing policy recommendations in Chapter VII: 1) the granting of leases only to those demonstrating a capacity to finance construction, and 2) the use of short-term leases renewable only on proof of completion of the construction. A substantial increase in the non-utilization fee has also been recommended.

1,548. The fruits of speculation are yielded through negotiability of leases or allotments. Transferability might be conditioned on the granting to the Government of a first option to buy back the lease or allotment interest by paying the amount of the original premium or charge, plus the replacement value of any added improvements (to be arrived at by a system of arbitration).

4. Review and possible amendment of the Sind People's Local Government Ordinance, 1972

1,549. Because of the potential problems associated with the 1972 Ordinance that were discussed earlier, it is desirable that it be reviewed as soon as possible and, if necessary, amended before it is fully implemented.
1,550. One of the most urgent issues to be resolved is the definition of the boundaries of each of the People's Municipalities. Although these need not be defined in the Ordinance itself, it may be desirable for the Ordinance to establish guidelines for the location of such boundaries. They should be related not only to population but also to factors such as the physical, economic and social structure of the Metropolitan Area, foreseeable needs for expansion, current deficits in major public facilities and services in specific localities, the potential tax base in each sub-area and existing jurisdictions. One of the questions to be dealt with is the way in which the Cantonment areas, the port areas, the Sind Industrial Trading Estate and other areas now administered by separate entities can be integrated most effectively with the rest of the metropolis for planning and development purposes. If the recommendations of the 1974-1985 Development Plan are followed, provision will be made, among other things, for gradual conversion of the Cantonment areas that are not required for essential military purposes into ordinary urban use.

1,551. Another possibility that should be examined is a simplification of the membership of the Corporation and the People's Municipalities.

1,552. A third, and vitally important, subject for review is the proposed fragmentation of responsibilities for basic urban functions among the various levels of government in the new local hierarchy. It is essential that a way be found to consolidate key functions such as water supply and sanitation, transportation, industrial and commercial development, housing, health and education.

1,553. The revenue base of local government also appears overdue for substantial overhaul. A number of the shortcomings of the present system have been pointed out in previous chapters and earlier in this chapter. For the sound development of the Metropolitan Area it is essential to create a fiscal structure which is: 1) capable of generating sufficient revenue for Karachi itself (as well as substantial revenues for the Provincial and Federal Governments); 2) growth-elastic; 3) equitable; 4) difficult to evade; and 5) reasonably easy to administer under present conditions.

1,554. The possibility of making all private use of public land leasehold, eliminating the right of public entities to sell or grant land to private entities, should be considered.

1,555. Effective provision must be made in the Ordinance for the proper co-ordination of Federal, Provincial and local planning and development activities in the Metropolitan Area — perhaps by the means suggested in the Draft Federal Urban and Regional Planning Act, 1972 and the Draft Model Provincial Urban and Regional Planning Act, 1972.

1,556. Provision must also be made for a proper recognition of private rights. (In Para. 89 of the present Ordinance, for example, it is indicated that appeals against orders of collectors, Councils, Chairman or servants of the Councils are appeals to the Controlling Authority; orders passed in appeals shall not be called in question in any
These are but a few of the features of the 1972 Ordinance that seem to call for serious review. It is recommended that such a review be undertaken in 1974, prior to the full implementation of the Ordinance.
ANNEX

RELATED DOCUMENTS

The following is a list of selected important reports, technical memoranda and other documents either prepared by the Project team or directly relevant for the conclusions and recommendations developed in the Project. The basic concern in making the selection has been to identify materials potentially useful for analyzing and evaluating the conclusions and recommendations contained in the Final Report. Other reports and memoranda produced in the Project but not in the present list include a number which have been superseded by those listed or by the present Report. A complete set of the reports and technical memoranda produced are available for reference with the Master Plan Department, Karachi Development Authority.
PREFACE


Project Advisory and Steering Committee, Minutes of the Policy Advisory and Steering Committee Meeting Held on 9 October 1972 (T/630). 11 December 1972.


CHAPTER II: THE NATIONAL CONTEXT

Analysis of Existing and Proposed Transportation Systems in Sindh and Karachi Region (MP/RR/19).

Natural Resources (MP/RR/24).


Analysis of Existing Population Data and Projections (MP/RR/27).

Analysis of Major Economic Activities (MP/RR/41).


Draft Model Provincesl Urban and Regional Planning Act (MP/RR/60).

Commentary on Draft Urban and Regional Planning Acts for Pakistan (MP/RR/61).

Water Resources of West Pakistan and Karachi Region (MP/BR/74).

The Shelterless and Squatters Problem and Planning Prospects (MP/35).

The Shelterless in Pakistani Cities (MP/35).

Metropolitan Government Lahore - A Case Study (MP/42).

The Problems of Shelterless People and Squatters in Pakistani Cities (MP/45a).

Riauzuddin, Ahmad, Agroville Development Programme. 29 April 1972.


Cerveny, M., Energy Systems in West Pakistan and in Karachi Region (T/715).


Van Huyck, A.P., Pakistan Savings and Loan Institutions (P/75). 7 November 1972.

CHAPTER II: THE METROPOLITAN CRISIS

Master Plan Department, Issues of Karachi Metropolitan Area (T/413). 6 October 1971.


CHAPTER III: IMMEDIATE TASKS

See appropriate chapter.

CHAPTER IV: OBJECTIVES

CHAPTER V: REGIONAL GROWTH

Study of Climate - Part I (MP/RR/6).
Land Forms and Drainage Basins in Karachi Region (MP/RR/9).
Mineral Resources of Karachi Region (MP/RR/10).
Geological Characteristics of Karachi Region (MP/RR/11).
Tectonic and Earthquake Occurrences in Karachi Region (MP/RR/12).

Existing Settlement Patterns (MP/RR/21).

Analysis of Regional Economy (MP/RR/45).
Development of Fishing Potentials (MP/RR/45).

6 November 1972.

Regional Unit, Mineral Resources in the Region (T/627).
9 December 1972.


CHAPTER VI: METROPOLITAN GROWTH

Evolution of Karachi in Maps (MP/RR/5).
Study of Economy of Karachi (MP/RR/15).
Report on Survey of Industries in Dhaobi and Oharo (MP/RR/18).

Analysis of Existing Population Data (MP/RR/21).
Socio-Economic Homogeneous Areas (MP/RR/50).
Analysis of Karachi Economy: Locational Preferences and Input Requirements (MP/RR/51).
Supply of Foodstuffs to Karachi (MP/RR/55).
Geographical Distribution of Population (MP/RR/64).
Case Study: Korangi Section 16-A. Evaluation and Proposals for Housing and Community Layouts (MP/RR/10).
Case Study of Liaquatabad.

Buildings of Architectural or Historic Interest (MP/3).

Karachi: Federal Territory 1960 (MP/6).

The Growth of Karachi in Maps (MP/7).

Karachi Open Space (MP/8).


Karachi: Bohri Bazaar (MP/13).

Karachi: Land-Use Problems (Predominant) (MP/17).

Karachi: Industries (Location and Employment) (MP/22).


UNEP, The Karachi Waterfront (Selected Problems) (MP/33).


Report on Rehabilitation of Tanning Industry in Karachi (MP/N/18).


Survey of the Flood-Affected Structures in Lyari River, Aurangi Bala and Gujro Bala (A Preliminary Report) (MP/N/26).

Meier, R.I., Free Ports and Modern Industrialization (T/231), 16 August 1971.

Meier, R.I., An Economic and Demographic Approach to Estimating the Long-Run Pressure for Urbanization (T/233), 16 August 1971.


Master Plan Department, Utilization of Land Around Quaid-e-Azam's Mausoleum (QOMC/01/71 and /03/70), April and August 197
Master Plan Department, Karachi Steel Mill Site Selection (T/448), May 1970.


Herbert, J.D., Suggestions for Amendments in the Draft Findings of the Committee for Steel Mill (T/481), 17 February 1972.


Master Plan Department, Land Use Analysis - Karachi Urban Area (unnumbered), March 1972.

Herbert, J.D., Imminent Decisions on Scheme 33 (T/514), 24 April 1972.

PUR, Locational Requirements of Major Groups of Industries (T/540), 4 July 1972.

Master Plan Department, Analysis of Regional Economy (T/554), 1972.

Stubbs, J.R., Basic Data by Analysis Zones (T/576), 11 October 1972.


Sogar, T., Redevelopment of Jacob Lines (T/619), 14 November 1972.


Cevney, M., Growth Rates of Income by Particular Groups (T/654), 27 December 1972.

Cevney, M., Expenditures per Household for Particular Income Groups (T/657), 30 December 1972.


Master Plan Department, List of Constraints and Commitments (T/746). Undated.


Master Plan Department, Projected Size Distribution of Large-Scale Industrial Establishments (T/746). 5 April 1973.


Cerveny, M., Number of Members per Household by Monthly Income Groups (T/746). 12 April 1973.


Stubbs, J.R., Methodology and Summary Tables for the Location of Economic Activities and Employment (T/746).

Havlík, L., Development Policy for Scheme 13 (T/919), 2 October 1973.

Havlík, L., Development Policy for Scheme 11 (T/920), 5 October 1973.

Havlík, L., Development Policy for Scheme 11 - Part III (T/921), 19 October 1973.


Steel Mill Consultants, Conclusion on Possibility and Expediency of Using the Pipri Site Instead of the Buleji Site for the Construction of the Karachi Steel Mill (T/996), 12 April 1973.

CHAPTER VII: WATER RESOURCES DEVELOPMENT

Herbert, J.D., Desalinization (T/165), 22 July 1971.

Regional Unit, Hab Dam as Self-Financing Project (T/677), undated.

Regional Unit, Utilization of Natural Potentials in the Region (T/700), 30 January 1973.


CHAPTER VIII: REGIONAL TRANSPORT

Karachi Civil Airport (MP/RR/28).

Railways and Railway Traffic in Karachi Metropolitan Region (MP/RR/52).

The Second Port in West Pakistan "Note of Comments on the Economical Engineering Feasibility Study (MP/50).


Husain, I., Shifting of the Pipri Marshalling Yard (1/1001). February 1974.

MPD, Working Paper for Meeting of Ports and Harbours, undated.

CHAPTER IX: AGRICULTURE

Agriculture in Karachi Region (MP/RR/27).

Natural Resources and Agricultural Potentials (MP/NR/81).

Karachi: Irrigation and Green Belt Problems (MP/9/13).


CHAPTER X: INDUSTRIAL AND COMMERCIAL DEVELOPMENT


CHAPTER XI: HOUSING

Low Cost House Types in Karachi (MP/RA/3).

Sociological Aspects of Low-Cost Housing (MP/RA/16).

Toward a Housing Policy for Karachi (MP/RA/26).


Karachi: Rate of Private Residential Building (MP/9).

The Role of Construction Companies and Trusts in Housing Development in KDA Schemes 1958-1968 (MP/54).


Sub-Committee on Housing, National Housing Policy (T/679). December 1972.

CHAPTER XII: URBAN WATER SUPPLY, SEWERAGE, DRAINAGE, AND SOLID WASTE


Analysis of Existing and Proposed Water Supply (MP/RR/54).

Analysis of Existing Sewerage System (MP/RR/77).

PDOR, Technical Levels of Utilities (Typology) (CT/511).

Utilities Unit, Water Supply Situation in Karachi (T/801).

Utilities Unit, Study of Sewerage System in Karachi (T/808).


Delvi, A.H., Unaccounted-for Water (T/943).

Administration, LMC, Checking of Leaksages in Water Supply Lines (T/999).


CHAPTER XIII: ELECTRICITY AND GAS

Analysis of Utilities - Electricity (MP/RR/38).


CHAPTER XIV: URBAN TRANSPORT

Roads and Road Traffic in Karachi Metropolitan Region (MP/RR/4).

Arterial Roads in Karachi Urban Area (MP/RR/7).

Bicycle Survey (MP/RR/33).


The Karachi Bus Industry (MP/RR/43).


Proposed One-Way Street Couplet, An In-Town Distribution System for the Drigh Road Corridor (MP/RR/69).


Grade Crossing Study in Karachi Urban Area (MP/RR/72).

Summary of First Cycle Transport Models and Results (MP/RR/73).


Car Parking (MP/4).

Karachi Tramway (A Note for the Traffic Committee of Administrators Office (MP/5).

The Problems of Road Connections Between the Harbour (West Wharf) and the City in Karachi (MF/29).

Town Planning Comments on the Road Connection Between East Wharf and the City in Karachi (MF/18).

Karachi Suburban Railway (MF/31).

Maintenance and Modest Expansion of Road Transport Services of SRTC (MF/P31).


Rogers, L., Summary and Conclusions to Drign Road Development Scheme (T/611). 16 November 1972.


CHAPTER XV: COMMUNICATIONS


CHAPTER XVI: TOURISM AND RECREATION

Manora Beach Development (MP/BR/30).

Present Position of Shoreline Development (MP/BR/56).

Recreational Sports in Karachi.

MPD, Development of Tourism in Karachi Region (T/831). 7 December 1972.
CHAPTER XVII: RELIGIOUS FACILITIES

None.

CHAPTER XVIII: DEFENCE LANDS

None.

CHAPTER XIX: MANDATORY EMPLOYMENT AND LABOUR POLICIES AND SERVICES

Herbert, J.D., Note on Unemployment as an Issue in Planning for Karachi (7/372), 14 October 1971.

CHAPTER XX: EDUCATION AND TRAINING

Educational Services in Karachi (MP/RR/511).

Education Report (MP/RR/61).

Karachi Education Facilities [Primary and Secondary] (MP/18).

CHAPTER XXI: HEALTH AND POPULATION PLANNING

Health Services in Karachi (MP/RR/371).


Karachi Survey of Medical Facilities (MP/211).

Karachi Medical Facilities (MP/251).

CHAPTER XXII: SOCIAL WELFARE SERVICES

None.

CHAPTER XXIII: THE METROVILLE PROGRAMME

CHAPTER XXIV: FINANCING THE DEVELOPMENT PLAN


KMC, Payments Due to KMC (T/618). 9 August 1972.


CHAPTER XXV: THE NECESSARY INSTITUTIONAL FRAMEWORK

Karachi: Town Planning Regulations 1961 (MP/1).

Acts and Orders Relating to Planning in Karachi (MP/2).
The Analytical Framework, Development and Evaluation of Alternatives

Evaluation of Transportation Aspects of First-Cycle Proposals (Unnumbered).


HPSC, Foundations for Basic Alternatives - Houston (T/511), 24 April 1972.

Leven, C. L., Analyzing Alternatives for a Master Plan (T/467), 21 August 1971.

Leven, C. L., Plan Alternatives for the Second Cycle (T/720), 21 January 1972.


MAPPING, ZONING, LAND USE SURVEY, SOCIO-ECONOMIC SURVEYS, CENSUSES


Karachi: Aerial Survey (MP/10).

Correspondence List (MP/N/12).

MPD, Preparatory Activities: Field Instructions for the Proposed Land Use Survey, 1972 (T/1). undated.

IACP, Preparatory Activities: Questionnaire for Socio-Economic Survey (T/2). undated.


MASTER PLAN DEPARTMENT, WORK PROGRAMMING AND PROJECT MANAGEMENT


Concept of the Project (MP/RR/1).

Preparatory Activities Work Programme (MP/RR/2).

Report on Planning Area (MP/RR/17).

Evaluation of Preparatory Activities (MP/RR/49).
