

URBAN GROWTH THEORIES AND THE URBAN GROWTH PATTERN FOR
THE UPPER EUPHRATES REGION OF IRAQ

VOL. 1

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A THESIS SUBMITTED TO THE UNIVERSITY OF SHEFFIELD
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF TOWN AND REGIONAL PLANNING

MAY, 1982

SUMMARY

During the last four decades, Iraq, like most other developing countries, faced very rapid urban growth. Due to the absence of definite urbanisation policies, the major part of the urban growth went to the main cities, in particular, the capital Baghdad. Such a pattern of growth created many socio-economic problems at the national, as well as the urban level.

This study represents an attempt toward developing a methodology of dealing with urban growth problems on a regional level in Iraq. It aims at finding what is thought to be, under the prevailing socio-economic and physical constraints, the most efficient urban growth pattern in the Upper Euphrates Region (U.E.R.) up to 1985.

To achieve this aim the study first reviews and critically examines a wide range of urban growth theories and models. Despite the lessons that were learned from this review and the adoption of many of their principles in developing this study, they did not provide a ready made answer to the problem of urban growth in the region. Secondly, for the better understanding of urbanisation and spatial development policies in Iraq and the U.E.R. a thorough examination of these and other aspects has been dealt with in part two. Thirdly, after examining the basic techniques that could be used in analysing the urban growth problem, such as the cost-benefit analysis and its refinement the planning balance sheet, threshold analysis and the goals-achievement analysis, it is found that the latter, at this stage of development in Iraq could be applied in studying such a problem. Finally, three alternative urban growth patterns were considered, i.e., the expansion of the largest urban centre in each urban node, the expansion of the proposed smaller urban centres and the establishment of a new town in each urban node and a set of socio-economic, physical, environmental and structural factors that were thought to affect strongly the proposed urban growth patterns were incorporated in the analysis. From these it was found that the expansion of the largest urban centre in each urban node is the most suitable solution at this stage of the socio-economic development of the region. The vitality of this conclusion was tested by applying sensitivity analysis which supported it.

ACKNOWLEDGEMENT

It is with great pleasure that I wish to thank the many people who have assisted and encouraged me to undertake this research although it is not possible to mention them all by name.

However, deep gratitude goes to my supervisor, Dr. Charles Choguill for his constructive comments, unfailing guidance and encouragement throughout the course of the study. My deep gratitude also goes to Miss M. N. Fulcher for her supervision of the work in the latest stages and for her valuable and constructive comments throughout the study. A special thanks also goes to Professor F. I. Masser, the head of the department of town and regional planning for his useful comments and encouragement.

I would also like to express my gratitude to the people in the computing services of the University of Sheffield for their help in producing the computer programme.

I am particularly indebted to the Iraqi Ministry of Planning whose grant of a scholarship enabled me to undertake this research. Special thanks are also due to all those people in Iraq who greatly helped me during the course of the field survey, particularly those of the Physical Planning Commission and the Central Statistical Organisation of the Ministry of Planning and many other departments for their kindness in allowing me to have access to the needed information. My thanks go to Al-Anbar governor, his deputy, the heads of the administrative units and services department for their utmost help in facilitating the necessary data for the research.

Last, but by no means least, I would like to thank Mrs. P. Grayson for her patience and careful typing of the thesis.

S. M. POLOUS

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CHAPTER ONE

INTRODUCTION

CHAPTER ONE

INTRODUCTION

1.1. The Urban Growth Problem

All over the world the urbanisation process is accelerating and urbanism is rapidly becoming a way of life. Urbanisation scholars have estimated for instance that, by the end of this century a world population would stand at about 6 billions of which 4 billions would live in urban centres. Until recently, extensive urbanisation was limited to Western European nations, but that situation is changing and developing countries are rapidly acquiring an expanding share of the world urban population.⁽¹⁾

However the process of urbanisation in developing countries is characterised by extensive concentration of resources and activities in one or few urban centres, i.e., the existence of the primate city phenomenon. Similar traits of concentration are observable in the case of Iraq, with special reference to the city of Baghdad. In 1977, 38.2% of the total urban population of Iraq were concentrated in Baghdad Muhafadah and 61% were living in four major Muhafadahs, namely, Baghdad, Ninevah, Basrah and Ta'amem. This pattern of urban population concentration was a result of the economic development policies before 1970 which can be characterised by an overwhelming concentration of economic development in the above mentioned Muhafadahs, especially the capital Baghdad. Such a pattern of growth brought into existence an over increasing awareness of the disparities of prosperity and economic growth rates in different regions of the country. Hence, the National Development Plans policies since 1970 turned to regional problems and gave this aspect a special consideration in the allocation of the

(1) Adefemi S. Adekanye, Models for a National Urban Development Policy: A case study of Nigeria, Unpublished Ph.D. Dissertation, University of Pittsburgh, Pennsylvania, 1975, P.V.

investment in an attempt to reduce the disparities between different regions, on the one hand, and between urban and rural areas on the other hand. This change in the economic strategies seems to be a general trend in most of the developing countries. Logan for instance emphasised this point and pointed out that "In developing countries interest is growing in the way geographical space can be organised to increase national rates of economic growth and to ensure that the benefits of growth are passed on to the greatest number of people."⁽¹⁾ He adds "The close historical association of economic development with spatial change in the economically advanced countries suggests that in developing nations both aims can be achieved by planning the allocation of investment in space as well as in economic sectors."⁽²⁾

However, trying to change the pattern of urbanisation from a very concentrated one to another less concentrated in character is part of the problem of the urbanisation phenomenon. What is of equal importance, from both efficiency and equity points of view, are the sizes and spacing of urban centres within the country and or the region, for the sizes and spacing of urban centres affect the performance of the overall national development policies. Historically, the study of this aspect of urban growth has been largely confined to countries of European culture. As a result many of the generalisations about the urban growth phenomenon, though treated as if they were universal, are actually limited to Western experience and may be misleading when applied to the rest of the world. This argument goes in the same line with Richardson's statement that "The theory of urban growth is an under developed area in the field of urban and regional economics. This is partly a

(1) M.L.Logan, "The Spatial System and Planning Strategies in Developing Countries", in John Blunden et.al.(ed.) , Regional Analysis and Development, Open University Press, London, 1973, P.283.

(2) Ibid, P.283.

consequence of the great diversity of urbanisation experience which does not easily lend itself to generalisation. It also reflects the complex character of the urban growth process and the fact that the city is probably more of a social and cultural phenomenon than an economic entity, so that its development cannot be explained solely in economic terms."⁽¹⁾

The above statements suggest that attention within the context of the developing world should be given to the problem of the urban growth pattern. In dealing with such problems, the domestic factors and constraints should be taken fully into consideration. This of course does not rule out the possibility of learning from experience of the developed countries and wherever possible one should adopt the principles developed there in the field of urban growth theory and practice.

1.2. Aims and Scope of the Study

This study focuses, in general, on Iraq's urban growth problems and, in particular, on the Upper Euphrates Region (U.E.R.). It attempts to investigate the urban growth pattern that should result from the economic development projects that are to be implemented in the region up to 1985.

The U.E.R. has been chosen as a case study area because it has been in the past, at least until the late 1960's, a lagging region in terms of economic growth with high levels of outmigration from it. However, more recently, the National Development Plans of 1970-1974 and 1976-1980 have given a special importance to the region. These plans have played an important role in the government's decentralisation policies.

(1) Harry W. Richardson, Regional Economics, Location Theory, Urban Structure and Regional Change, Weidenfield and Nicolson, London, 1969, P.156.

For the purpose of the regional urban growth analysis in this study, the direct, indirect and induced employment effects of the major committed projects will be taken into consideration. This implies that the regional employment multiplier effects of the committed projects will be utilised to determine the expected urban growth up to 1985 and beyond. To be realistic only the multiplier effects in the operating phase will be incorporated in the analysis. This is due to the fact that employment in the implementation phase is for a temporary period of time. Hence, the construction employees at this stage are not stable at a specific site. Field visits to sites of the projects showed that most of the people working in this phase are foreigners. They came to the site just to construct the factories, roads, the Hadith dam and so forth and then they will leave the region and most probably, the country as well. Even the small proportion of the Iraqis working in the implementation of these projects are mainly from other Muhafadahs and they, most probably, will leave the site or the region upon completion of the projects. Some are, however, from the study area and there is a possibility of them continuing to work on these projects during the operation phase. However, the proportion of the employees that will continue to work in the region in the operational phase is implicitly included in the analysis.

All parts of the region are included in the analysis except Ana Qadha. This is due to the fact that no major projects were committed in this part of the region. Furthermore, the resettlement of Haditha Reservoir population⁽¹⁾, have been dealt with in detail by many governmental studies which will be mentioned at later stages when appropriate. However, the implications of the resettlement schemes on the overall regional urban system will be included in the analysis of the urban growth pattern of the region wherever that is applicable.

(1) As it will be seen later on, the main urban centres of Ana Qadha, Ana and a major part of Rawa towns, will be flooded as a result of the construction of Haditha dam.

It is therefore the aim of this study to examine empirically the possible urban growth strategies in the U.E.R. and to choose the one which is thought to be the most suitable strategy in socio-economic, physical, structural and environmental points of view. To achieve this aim the study examines some hypotheses. These hypotheses are:

First, alternative urban growth patterns could be dealt with for the purpose of the distribution of the expected urban growth in the region.

Second, socio-economic, physical, structural and environmental factors could affect the pattern of the expected urban growth in the region.

Third, evaluation techniques such as the cost-benefit analysis, threshold analysis and goals-achievement analysis could be used for solving the problem of the urban growth in the region.

1.3. Importance of the Study

The potential contribution of this study lies in several areas. It suggests an urban growth strategy for a region passing through a rapid urban growth period by applying a systematic analytical approach, the goals-achievement procedure, to solve the problem. It examines at the micro-level the urban growth problem in the country. It attempts to isolate the essential factors which are necessary in the decision - making process. It also directs the attention of Iraqi planners to the existing weaknesses of their plans for the urban growth of the U.E.R. Accordingly, the study provides an analytical procedure to deal with urban growth problem in any region of the country taking into consideration, of course, the local variations and constraints in the analysis process.

In addition to the above main contributions of the study, it provides many secondary benefits. It identifies the data and information

needed to carry out similar studies and accordingly, it provides the basis for the details and methodology of providing such data in Iraq. It develops a methodology for examining the different factors which are important elements of the urban growth process. Particular attention is given to the measurement of the correlation between urban size and the per capita capital and annual running costs of various urban services.

Finally, it should be noted that the study incorporates and builds upon theoretical and empirical contributions in the field of urban and regional planning, in general and the urban growth theory in particular. The study gave this aspect a special emphasis. As it will be shown later, it devoted three chapters for literature review. This theoretical elaboration due first to the benefits and lessons that could be learned from the historical development in the field of urban theories and practice and second to the fact that the information and implications that could be drawn from the literature review has not previously been included in Iraqi studies. Hence, it is felt that it is important and it is one of the contributions that this thesis made.

1.4. Difficulties Encountered

The lack of the reliable data on most of the urban growth factors incorporated in the analysis was the main obstacle facing the study. The absence of domestic standards in some aspects of the analysis is also another difficulty faced by the study. For instance, no domestic travel time costs existed in the country and transportation studies in Iraq are still adopting Western standards which may result in faulty planning. The survey conducted by the author in the study area in 1980 facilitated the collection of data on various subject areas. Nevertheless, since the same standards are used in the evaluation of the alternative strategies, whether, these standards are domestic, Western and/or theoretical, the final results on the analysis probably will not be affected.

1.5. Structure of the Plan

In addition to the general introduction, the study is divided into three parts. Part I which contains three chapters focuses on the theoretical framework which is thought to be necessary to facilitate the understanding of the analysis presented in the subsequent chapters. Chapter 2 focuses on the causal relationship between urbanisation and economic development in developed as well as developing countries with special consideration given to the differences in the causes and pattern of urbanisation of these two groups of countries. Chapters 3 and 4 are mainly centred on the question of city sizes and distribution, focusing on the empirical advantages and disadvantages of various city sizes.

Part II contains two chapters. Chapter 5 deals with the background on Iraq, on the spatial distribution of economic development, the urbanisation trends and the correlation between these two phenomenon. Chapter 6 gives a background of the study area, identifying the main causes of urban growth, determining the spatial distribution of the expected urban growth and outlining the proposed directives for urban growth of the study area suggested by either governmental or consultants' studies.

Part III contains four chapters. Chapter 7 re-examines the applicability of the theoretical models presented in Part I to the case of the U.E.R. It presents the possible techniques of analysis and presents an account of the field survey. The alternative urban growth strategies for the study area and the choice of the preferred strategy are presented in Chapters 8 and 9 where the aims and objectives, the alternative proposed strategies, constraints of the analysis and the testing of the first priority factors are embodied in Chapter 8, whilst Chapter 9 contains the testing of the second and third priority urban growth factors and the analysis of the choice of the preferred strategy.

In choosing the preferred urban growth pattern, the overall outcome of the analysis and the results of the sensitivity analysis that will be made at this stage of the study will be considered. Chapter 10 contains the final conclusions of the study, the general recommendations and the scope for possible further research.

Finally, it should be noted that the tables and illustrations are numbered independently in each chapter.

PART I

URBANISATION AND URBAN GROWTH

THEORIES AND MODELS

PART I

URBANISATION AND URBAN GROWTH THEORIES AND MODELS

INTRODUCTORY REMARKS

The main aim of this thesis is the study of the urban growth pattern in a developing region, represented by the U.E.R. of Iraq. To reach a realistic solution, the study of such a problem requires the inclusion of many factors, socio-economic, physical and environmental ones, in the analysis. The set of factors that should be considered differs according to the local circumstances of the area under investigation. However, despite the importance of the local constraints in determining the factors to be involved in the analysis of such a problem, the fuller understanding of the urban growth phenomenon in theory, as well as in practice is a very essential process in solving any local problem of this kind.

Literature on urban growth and the city size distribution problems is very rich. Since the end of the last century the interest on these subjects has grown and it has been dealt with in different contexts: from the theoretical points of view in models of spatial organisation, in studies of economic and demographic development, as well as in comparative regional or country investigation, in the context of optimal development strategies and from the point of view of regional economic and social policies in general and in many countries. Hence, for the better understanding of the development and changes in the thinking of such a problem a detailed review of literature will be undertaken in this part of the study. The main objectives from such a detailed examination is to see:-

First, if adequate models exist to explain the existing and/or optimal city size distributions.

Second, the importance of having a well spaced hierarchical urban system.

Third, the validity of the statistical models of the rank-size regularities in explaining the existing city size distribution patterns.

Fourth, the magnitude of the economies of scale with urban size.

Furthermore, the wide review of literature will facilitate the understanding of the urban growth problem in Iraq and the U.E.R. This particular aim could be achieved through recording the changes in the understanding of the urban growth problem over time and according to different socio-economic and geographical environments (mainly developed as against developing countries) and through tracing the similarities and differences between urbanisation process of developed countries during their first stages of development and developing countries at present time. The latter point will help in avoiding the direct copying from the experiences of the developed countries.

Accordingly, to achieve the above objectives, this part will first clarify the macro relationships between the economic development and industrial development, on the one hand, and urbanisation process on the other hand. It will also extend to draw experiences from the urbanisation process of both developed and developing countries and it will show the differences in the urbanisation of these two groups of countries. Second, this part will examine different urban growth and city size distribution models and theories since the theoretical formulations of Christaller and Losch in the 1930's up to late 1970's, the era of the optimal city size models. This theoretical presentation will be supported by empirical documentations on the economies and diseconomies of city sizes and distribution.

Hence, this part of the study, the detailed theoretical review of literature, is included in the study to establish the basis for the analysis of the urban growth strategies in the U.E.R. that will be presented in part three of the study. The applicability and/or the utilisation of at least some basic principles of the theories and models discussed in this part will, later on, be re-examined in Chapter Seven.

CHAPTER TWO

ECONOMIC DEVELOPMENT AND URBANISATION

CHAPTER TWO
ECONOMIC DEVELOPMENT AND
URBANISATION

INTRODUCTION

There is a mutual relationship between the two processes of development and urbanisation. Both are partial areas within sectoral and spatial economics respectively.⁽¹⁾ Each of them strengthens and reinforces the other. In order to visualise this interrelationship, its directions, historical development, as well as the differences between developed and developing countries in this respect, this chapter will try, first of all, to define what the development and urbanisation processes means? It will then discuss the interrelationship between the two processes. Because of the great importance of industrial development (mainly manufacturing in the urbanisation process, this chapter will also elaborate on the interrelationship between these two processes. Finally the chapter will try to focus on the differences between urbanisation process of developed countries during their first stages of development and urbanisation of developing countries in recent decades.

2.1. What does Economic Development and Urbanisation Processes Mean?

2.1.1. What does Economic Development Mean?

(1) J. R. Lasuen, "Urbanisation and Development - The Temporal Interaction Between Geographical and Sectoral Clusters", Urban Studies, Vol.10, 1973, P.166.

Economic development which is generally defined to include, in addition to merely "economic growth"⁽¹⁾ the social aspects of development, means essentially a steady increase in output per capita achieved through a mobilisation of resources and the use of resources in a more productive manner. This mobilisation is facilitated by changes in demand and by new methods of organisation and production."⁽²⁾ It also implies changes in the structure of the economy.

The social aspects of development were clearly stressed by Friedmann and Gertler. Friedmann stated that development refers to unfolding of the creative possibilities inherent in society.⁽³⁾ Gertler believes that "'development' occurs only when 'Growth' is accompanied by 'environment making'".⁽⁴⁾ According to Gertler⁽⁵⁾ 'growth' refers to expansion of production, human settlements, or an entire system without any basic change in its structure while 'environment making' is the process of creating a setting in which both the biotic and built components are favourable to the long-term well-being of human communities.

(1) Economic growth is associated with either rising per capita levels of income or the maintenance of existing high levels of income, See, Jacob Viner, "The Economics of Development", in, A. N. Agarwala and S. P. Singh (ed.), The Economics of Underdevelopment, A Galaxy Book, New York, 1967, P.16.

(2) M. L. Logan, op.cit., P.287.

(3) John Friedmann, Urbanisation, Planning and National Development, Sage Publication, London, 1973, PP.43-48.

(4) L.O.Gertler, "Human Ecology and Development: Canada and North America Region", Contact, Vol. 8, 1976, P.50.

(5) Ibid, P.50.

2.1.2. What does Urbanisation Process Mean?

Before answering this vague question, it is necessary to define what the term urban means? Although, urban population is widely understood to include the population resident in cities, the definition of urban is, nevertheless, a complex matter. Carter emphasises that "The problem of identification of what is urban has made all the more difficult by the fact that the concept and, indeed, the reality of what is urban are not static but are continually being changed by new conditions."⁽¹⁾ It varies greatly from country to country.⁽²⁾ Hence, most scholars of urbanism have long agreed that there is no absolute boundary line which would show a clearly cut cleavage between what is urban and rural. The United Nations demographic year book for 1952, which was devoted to the problems of providing adequate data on the urban population, concluded that, "...there is no point in the continuum from large agglomerations to small clusters or scattered dwellings where urbanity disappears and rurality begins."⁽³⁾ This fact has indeed been stressed since late 1920's by Sorokin and Zimmerman when they argued that "In reality the transition from a purely rural community to an urban one is not abrupt but gradual."⁽⁴⁾

Hence, because of the complexity of distinction between urban and rural communities, the standard census bureau classification, employed in much sociological research, involves three categories - urban, rural non farm and rural farm -⁽⁵⁾

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- (1) Harold Carter, The Study of Urban Geography, Edward Arnold Publisher Ltd., London, 1972, P.20.
 - (2) Philip M. Hauser, "Urbanisation, An Overview" in Philip M. Hauser and Leo F. Schnore (ed) The Study of Urbanisation, John Wiley and Sons, New York, 1966 P.9.
 - (3) Harold Carter, op.cit., P.17.
 - (4) Pitirim Sorokin and Carle C. Zimmerman, Principles of Rural-Urban Sociology, Henry Holt and Co., New York, 1929, P.14.
 - (5) Otis Dudley Duncan, "Community Size and Rural-Urban Continuum," in P. K. Hatt and Albert J. Reiss (ed), Cities and Society, the Free Press of Glencoe, New York, 1964, P.35.

To be realistic the term urban must be defined in terms of several characteristics. The delineation of areas as urban or rural is often related to administrative, political, historical or cultural considerations as well as demographic criteria.⁽¹⁾ As the United Nations year book has indicated, "definitions of "Urban" fall into three major types.

(1) Classification of minor civil divisions on a chosen criterion which may include: (a) type of local government, (b) number of inhabitants, (c) proportion of population engaged in agriculture; (2) Classification of administrative centres of minor rural divisions as urban and the remainder of the division as rural; and (3) Classification of certain size localities (agglomerations) as urban, irrespective of administrative boundaries."⁽²⁾

The multidisciplinary approach in defining the urban concept is largely stressed by most students of urbanism. Wirth's definition of City (as an Urban Centre) specified that a city is "...a relatively large, dense and permanent settlement of socially heterogeneous individuals."⁽³⁾ Sorokin and Zimmerman, also, in their compound definition, include these elements, and several others, among which they emphasised the importance of agricultural occupations as a criterion of rurality.⁽⁴⁾

The characterisation of a community as urban on the basis of one criterion is obviously arbitrary. Wirth emphasised this point and stated that, "...it is difficult to defend the present census definition which designates a community of 2,500 and above as urban and all others as rural."⁽⁵⁾ He argues that, "...the situation would be the same if the

1. Philip M. Hauser, op.cit., P.9.

2. United Nations, Demographic Year Book, New York, U.N., 1955, P.16.

3. Louis Wirth. "Urbanism as a Way of Life." in P.K. Hatt and Albert J. Reiss (ed.) op.cit., P.50.

4. Pitirim Sorokin and Carle C. Zimmerman, op.cit., Ch.2.

5. Louis Wirth, op.cit., P.48.

criterion were 4000, 8000, 10000, 250000 or 100000 population, for although in the latter case we might feel that we were more nearly dealing with an urban aggregate than would be the case in communities of lesser size, no definition of urbanism can hope to be completely satisfying as long as numbers are regarded as a sole criterion."⁽¹⁾ Wirth goes further to demonstrate that, "Communities of less than the arbitrary set number of inhabitants lying within the range of influence of metropolitan centres have greater claim to recognition as urban communities than do the larger ones leading a more isolated existence in a predominantly rural area."⁽²⁾ Finally, he stated, that "...it should be recognised that the census definitions are unduly influenced by the fact that the city, statistically speaking, is always an administrative concept in that the corporate limits play a decisive role in delineating the urban area."⁽³⁾

Apart from the fact that the figure used will be entirely dependent on arbitrary and often based on anachronistic boundaries, the real range of minima employed in national censuses, argues Carter, is ample testimony to this problem.⁽⁴⁾ The United Nations Department of Economic and Social Affairs publication, "Growth of Urban and Rural Population 1920-2000," presents a list of definitions used in the estimation of urban population as nationally defined, which best shows this arbitrary measurement.

(1) Ibid, P.48.

(2) Ibid, P.48.

(3) Ibid, P.48.

(4) Harold Carter, op.cit., P.18.

Table (2.1)

Examples of Minimum Population in National
Censuses, Used to Determine Urban Areas

France(1962)	Communes containing agglomeration of more than 2000 inhabitants living in contiguous houses or without more than 200 metres between houses, and communes of which the major part of population is part of multicommunal agglomeration of this nature.
Spain (1960)	Municipios of 1000 or more inhabitants.
East Germany	Communes of 2000 or more inhabitants.
Belgium	Communes of more than 5000 inhabitants.
Denmark (1960)	Agglomerations of 200 or more inhabitants.
Canada (1961)	Cities, towns and villages of 1000 or more inhabitants, whether incorporated or unincorporated, including urbanised fringes of cities classed as metropolitan areas and other major urban areas. In 1961, also including urbanised fringes of certain smaller cities if the population of city and its urban fringe was 10000 or more.
Japan	Urban municipalities (all Shi and Ku of Tokyo-to) usually having 30000 or more inhabitants and which may include some rural areas as well as urban clusters.
Mexico	Localities of 2500 or more inhabitants.

Source, Harold Carter, op.cit., Table 2.1(B), P.19

It should be noted that, the shortcomings which attach to number of inhabitants as a sole criterion of defining urbanism apply for most part to the use of other individual criterion, such as, density of population, the occupation of the inhabitants, the existence of certain physical facilities, institutions, and forms of political

organisations as well.⁽¹⁾

However, despite the unrealistic approach of defining the urban area on a basis of single criterion, it is hard to find a comprehensive adoption of the multidisciplinary approach of the delineations in the national population censuses. The following table reflects such a fact.

Table (2.2)

Frequency of Use of Criteria in Delimiting
Urban Populations in National Censuses

Criteria	Frequency of Use	
	Sole Use	Used in Conjunction with other Criteria
1. Size of population	23	26
2. Density of population or of housing	1	10
3. Predominant type of economic activity	1	7
4. Urban characteristics other than (1) to (3) above, or, unspecified urban characteristics.	3	13
5. Administrative functions or structure e.g. type of local government etc.	3	0
None Specified.	56	0

Source, Ibid, Table 2.1(a), P.18

The second and more fundamental question concerns the process of urbanisation, for it is essential to define and understand the nature of this process as a preliminary to any further investigation.

(1) Louis Wirth, op.cit., P.49

Lampard⁽¹⁾ argues that there are three concepts of urbanisation which have currency in the social sciences: the behavioural, the structural and the demographic.

According to Lampard, the behavioural concept conceives of urbanisation as an adjustment of personal behaviour in the sense that it focuses on the conduct of individuals. Certain patterns of behaviour or thought, regardless of social environment and local, are said to be 'urban'. Hence the process of urbanisation is one experienced by the individual over time. This approach has the special merit of not restricting urbanism to the city's physical milieu and as one favoured by many students of culture and arts. The structural concept⁽²⁾ ignores the patterned behaviour of individual persons and fastens on the patterned activities of whole populations. The process of urbanisation, according to this concept, is typically said to involve the movement of people out of agricultural communities into other and generally larger non-agricultural communities. This concept according to Lampard, gives primary recognition to the differential ordering of occupation or industries within a given territorial space. The structural approach has many applications in the social sciences and is the framework for virtually all economic models concerned with development. Hence, the crux of this approach, argued Carter, "...is the direct correlation of economic development with urbanisation and it is usually couched in the form of the identification of phases of economic development each of which is associated with a degree of urbanisation."⁽³⁾ The demographic approach focuses on the distribution of urban population in space, but largely ignores individual behaviour.⁽⁴⁾ In its most succinct form it

(1) Eric E. Lampard, "Historical Aspects of Urbanisation", in Philip M. Hauser and Leo F. Schnore (ed), op.cit. PF.519-520.

(2) In addition to above reference, see also, Eric E. Lampard, "The Evolving of Cities in the United States: Urbanisation and Economic Development", in Harvey S. Perloff and Lowden Wingo, Jr.(ed), Issues in Urban Economics, The John Hopkins Press, Baltimore, 1968, P.116

(3) Harold Carter, op.cit., P.28

(4) Eric E. Lampard, "Historical Aspects of Urbanisation" op.cit., P.520

postulates that urbanisation is a process of population concentration. Hence, this approach recognises only two variables: population and space. A certain occupational structure or personality trait is not prejudged. This approach is one commonly adopted by students of population and human ecology.

Each of these approaches is suited to a different range of analytical questions and each possesses its own peculiar difficulties of definition and measurement.⁽¹⁾

The degree of urbanisation of a nation for statistical purposes is generally defined as the proportion of the population resident in urban places. Urbanisation in this meaning, that is, as a process of population concentration has been systematically treated by Tisdal. He argued that it proceeds in two ways: "the multiplication of the points of concentration and the increasing in size of individual concentrations...."⁽²⁾ As a result of this multiple increments, the proportion of the population living in urban areas increases.

Urbanisation in the sense of increasing in the proportion of the total population living in urban places is obviously closely connected with rural-urban migration.⁽³⁾ Knox emphasised this point and argued "If birth and death rates in rural and urban areas were the same and if the age distribution of the population was the same, the rate of urbanisation would be identical with rural-urban migration."⁽⁴⁾ However, because of the invalidity of these assumptions, there can be no presumption, therefore, that urbanisation is exactly the same as rural-urban migration, but it is generally safe to assume, that migration is an important element in urbanisation.⁽⁵⁾

(1) For details of these difficulties See, Ibid, P.520.

(2) Brian J.L.Berry, The Human Consequences of Urbanisation, The MacMillan Press Ltd. London, 1977, P.27.

✓ (3) Frank Knox, "The Economic Causes of Urbanisation in Developing Countries" in Urban Development, Unit 10-14, The Open University Press, 1973, P.11.

(4) Ibid, PP.11-12.

(5) Ibid, P.12.

Gottmann in his paper entitled "The Urbanisation Phenomenon and its Implications" pointed out that "Modern urbanisation is a process which involves both concentration and dispersal."⁽¹⁾ He argues⁽²⁾ that firstly, there is a concentration of people and economic activity in certain areas of every nation which acquire higher densities than other parts of the same country and are therefore beginning to be more difficult to service. Secondly, there is diffusion around the old nuclei of the rapidly growing cities over relatively large areas within those selected regions today that benefit from the concentration. Thirdly, there is a diffusion of urban types of land use in formerly rural areas of investments of production and storage of manufactured goods. Fourthly, there is increasingly concentration of some closely interlinked activities developing very high densities at worktime in certain business districts.

2.2 Interrelationship Between Urbanisation and Economic Development.

The study of urbanisation in relation to economic development has several points of interest. In this first place as pointed out by Hoselitz, "... it offers a field for the testing of hypotheses on the theory of location. The precise location of new cities may, therefore, be planned, and the findings of the theory of location may be applied to the development of a net of urban settlements in new countries (or new parts of old countries)."⁽³⁾ The process of urbanisation, known to be intimately associated with economic development⁽⁴⁾ and urban growth, is exogenously determined

(1) Jean Gottmann, "The Urbanisation Phenomenon and its Implication," plan Canada, Special Issue, May 1971, P.20.

(2) Ibid, P.20.

(3) Bert F. Hoselitz, Sociological Aspects of Economic Growth, The Free Press, New York, 1965, P.160.

✓ (4) Kingsley Davis and Hilda Hertz Golden, "Urbanisation and the Development of Pre-Industrial Areas", in P.K.Hatt and Albert J.Reiss (ed), op.cit., P.120. Also See (in the same meaning), B.J.L.Berry, ✓ "City-Size Distribution and Economic Development" Economic Development and Cultural Change, Vol.9, 1961, P.587.

by growth in the national economy and by demographic trends.⁽¹⁾

Hoselitz, also argues that "The growth of population in urban and industrial centres appears to be inevitable if there is economic development, whether by industrialisation, by the development of mining or by commercialisation and improvement of agriculture."⁽²⁾

He adds, that "This relationship appears obvious at first sight, since the most highly developed countries are also, on the whole, most highly urbanised. The rapid growth of urban centres in Europe, more over, set in approximately at the same time as the first steps toward rapid industrialisation were taken."⁽³⁾

In the past two decades, a great concern for the interrelations between urbanisation and development has developed. This concern has crystallised out in the need to analyse the interactions between the two processes. Since the appearance of the Davis's⁽⁴⁾ paper titled "Growth of Urbanisation in the World", and Davis and Golden⁽⁵⁾ paper "Urbanisation and Development of Pre-industrial Areas", several authors have tried to test empirically the relationship between urbanisation and the development processes.

Davis, for instance, in another paper "The urbanisation of Human Population" using 1960 population and per capita income data, found that, "a linear correlation exists between per capita income and level of urbanisation".⁽⁶⁾ He found that, the three countries with a per capita income of \$ 1,500 or more a year have the highest degree of urbanisation and the 63 countries with per capita income under \$ 100 a year have the lowest degree - by either of two classifications of

(1) Larry S. Bourne, "Limits to Urban Growth; Who Benefit? Who Pays? Who Decides?" Contact, vol. 8, 1976, P.9.

(2) Bert Hoselitz, op.cit. P.159.

(3) Ibid, PP.217-218.

(4) K. Davis, "The Origin and Growth of Urbanisation in the World" American Journal of Sociology, Vol. 60, 1955, PP.429-445.

(5) K. Davis and H. H. Golden, op. cit., PP.120-140.


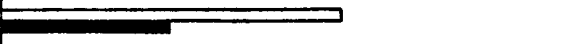
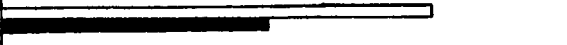



(6) Kingsley Davis, "The Urbanisation of Human Population", in Gerald Breese (ed), The City in Newly Developing Countries, Open University Set Book, Prentic-Hall, International, Inc., London, 1972, P.10.

urbanisation: the urban population as defined by each country or the population living in cities of 100,000 or more inhabitants,⁽¹⁾ as indicated by figure (2.1)

Figure (2.1)

Correlation Between Per Capita Income and Level of Urbanisation in the World*

▬ Urban Pop.
▬ City Pop.

Per Capita Income (Dollars)	Number of Countries	Number of Cities Over 100,000	Percent
Under 100	63	186	
100 - 300	89	303	
300 - 700	26	309	
700 - 1500	18	194	
Over 1500	3	171	
No data	19	178	
World Total	218	1341	

*The approximate date of the population statistics and per capita income used is 1960.

Source, Kingsley Davis, "The Urbanisation of Human Population" op.cit., P.10.

Berry also found in two of his studies⁽²⁾ that there is a positive correlation between urbanisation and economic development of a country. In first of these two studies, Berry proceeds from the assumption that association exists between the level of economic development of a country and the degree of its urbanisation.

(1) Ibid, P.10.

✓ (2) B.J.L.Berry, "Some Relations of Urbanisation and Basic Patterns of Economic Development" in F.R.Pitts (ed.), Urban Systems of Economic Development, (12) (Eugene, Oregon), 1962; and Brian J. L. Berry, The Human Consequences....op.cit.

To prove this assumption, Berry adopted a principle component analysis using 43 indices for 25 countries. The result of the analysis revealed that four factors accounted for 90 percent of the variance. In many ways, this was hardly surprising, for Berry puts into his matrix variables which are essentially economic or demographic in context and in some cases almost tautologous.⁽¹⁾ The first set of components, (economic component), used by Berry, were associated with transport, communications, trade, energy production and consumption, national product and public services. The second factor was termed demographic. These two components were associated in the evaluation of a scale of economic development when they showed a high positive correlation with urbanisation.

The linear correlation between economic development and urbanisation stressed by Davis, has been confirmed by the second study of Berry⁽²⁾ who in turn, using more recent population and per capita income data found such a linear correlation existed between the two processes. Table (2.3) and figure (2.2) reflects Berry's finding.

The direct association between development and urbanisation is not only tied to the main regions and countries of the world, but it can also be seen in specific regions or areas within the same

(1) Harold Carter, op.cit., P.29.

(2) Brian J. L. Berry, The Human Consequences....op.cit., PP.74-77.

Table (2.3)

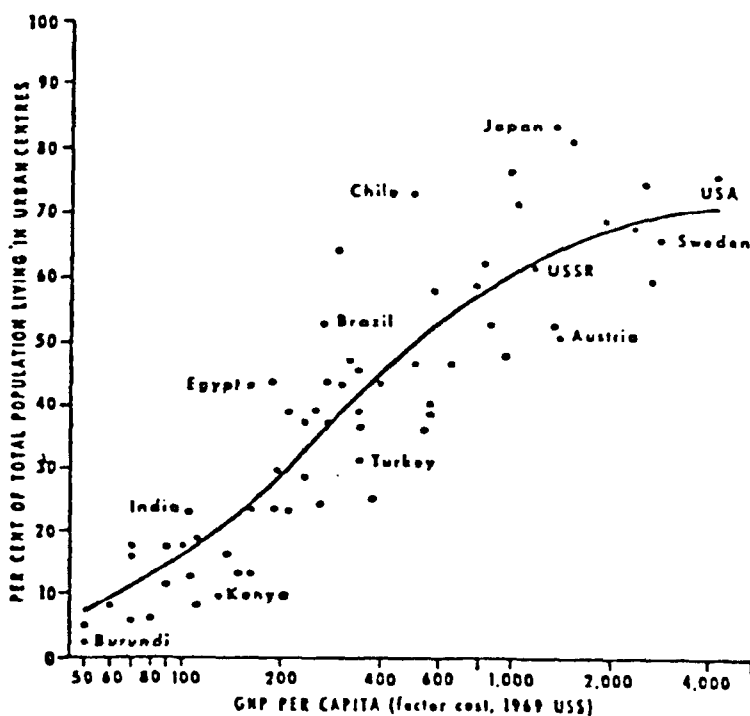
Correlation Between Per Capita Income
and Level of Urbanisation in the World

Urbanisation	Groups of Countries by Per Capita Income(U.S.\$)					
	1000 and over	575- 1000	350- 575	200- 350	100- 200	Under 100
Percent of total population in urban areas (recent census)	68.2	65.8	49.9	36.0	32.0	22.9
Percent of population in communities of more than 100,000,(about 1955)	43	39	35	26	14	9

Source, Extracted from Brian J. L. Berry, *The Human Consequences....op.cit.*, Table (5), P.77.

Figure (2.2)

Degree of Urbanisation of World Bank Member -
Countries Compared with their Gross National
Product in 1970



Source, Ibid, Figure 10. P.75.

country. Logan⁽¹⁾, for instance, in his study "The Spatial Dimensions of Economic Development; the case study of upper Midwest" of U.S.A., found that "Areas of greatest wealth and growth are... those with a high non-rural population."⁽²⁾ This finding has been reached as a result of testing the behaviour of sixteen variables which were stated as indicators of levels of economic development. This test includes 241 counties in Minnesota, Wisconsin and Michigan and used 1960 data.

As a result of this close correlation between development and urbanisation, Richardson argues that "....growth in the national economy will have repercussions on the structure and growth of cities via its impact on the supra-regional functions of business firms located in metropolitan city centres".⁽³⁾ The national system of cities may be treated as the spatial form of organisation adopted by the industrial economy to achieve its goals.⁽⁴⁾

However, it is necessary to mention, that the close correlation between development and urbanisation, does not mean that it is a perfect correlation. Examinations of the correlation between the two processes indicate that there are some exceptional cases.

(1) M. I. Logan, "The Spatial Dimensions of Economic Development; The Case study of Upper Midwest", Regional Studies Vol. 4, 1970, P.119.

(2) Ibid, P.119.

(3) Harry W. Richardson, op.cit., P.174. In the same meaning see also, F. S. Perloff, Key Factors of Regional Planning", Journal of American Institute of Planners, Vol. 34, 1968, PP.153-159.

(4) Harry W. Richardson, "Optimality in City-Size Systems of Cities and Urban Policy - A sceptic's view", Urban Studies, Vol.10 1972, P.29.

Bairoch, for instance, stated that "Many diverse factors, geographical and social as well as political and historical, play their part in the pace and form taken by the concentration of population in an urban setting".⁽¹⁾ To prove that, Bairoch chose pairs of countries with a similar general structure within the confines of Europe. He found at least three cases in which the more urbanised country is the less economically developed, as illustrated, in the following table.

Table (2.4)

Percentage of Urban Populations in Selected European Countries and their Per Capita Income

Country	Urban Population % (1960)	Per capita (1958-1963) GNP (U.S \$)
Austria	38	805
Switzerland	28	1570
Holland	60	930
Belgium	52	1180
Hungary	38	830
Czechoslovakia	25	1200

Source, Paul Bairoch, op.cit. footnote (3), P.233.

Many factors, economic as well as non-economic, stand out as determinants of city growth and urbanisation. Hatt and Reiss⁽²⁾ outlined five of these factors, they are:-

1. Agricultural revolution: According to this factor the growth of cities and consequently urbanisation is inevitably linked to agricultural productivity. Only with an agricultural system capable of producing a surplus of food is it possible to withdraw labour from the immediate problem of food production and apply it to the many kinds of consumption and capital goods and services characteristics of city life.

(1) Paul Bairoch, The Economic Development of the Third World, Since 1900, Translated by Cynthia Postan, Methuen and Co. Ltd. London, 1975, P.144.

(2) P. K. Hatt and Albert J. Reiss (ed), Cities and Society, op.cit. PP. 79-81.

Thus, the greater the productivity per worker of an agricultural system the greater is the possibility of it supporting a large urban population.

2. Technological revolution: The invention of efficient techniques for converting the energy into fuels, particularly the invention of the steam engine, and the derived development of mass-production techniques and the factory system made possible the support of masses of people densely settled in small areas and alienated from land.

Clark and Fisher, developed the thesis that '...technological progress reduces labour requirement in the primary sector of the economy, thereby making available a large proportion of the labour force to the secondary sector. Later, technological progress in the secondary sector permits an increasing of the labour force to be employed in tertiary activities.'⁽¹⁾

Perroux was the first author to hypothesise that both development and urbanisation resulted from the innovation process. Lasuén⁽²⁾ follows Perroux, adding that innovations progress in cluster-like fashion affecting the system of growth poles.

3. The commercial revolution is therefore the third factor in the growth of urbanisation. The development of world market, exchange systems and radically improved means of transportation and communication, argued Hatt and Reiss⁽³⁾, allowed cities to develop under conditions which otherwise would have prevented their appearance. They add, "Historically, the impetus to city growth given by the expansion of trade actually preceded the principle effects of industrialisation."⁽⁴⁾

(1) William H. Mieruyk, "Labour Mobility and Regional Growth", in John Blunden et.al. (ed), op.cit. P.103.

(2) J. R. Lasuén, op.cit. P.168

(3) P. K. Hatt and Albert J. Reiss (ed), op.cit., P.80.

(4) Ibid, P.80.

4. The fourth factor in urbanisation is increased efficiency of transportation. Since cities depend necessarily upon trade, as described above, increases in the efficiency of long-distance transportation have had a powerful stimulating effect upon urban growth. Thus, the automobile, the electric car, rapid transit, trucks, buses and elevators all have contributed much to the growth of the huge metropolitan centres of today.

5. The demographic revolution which is the sequence of these other development (mainly industrial revolution) also played a role in urban growth. Hatt and Reiss argued that the appearance of urban-industrial society brought with it sharp decreases in mortality. Birth rates, however, did not fall so rapidly and one result was a phenomenal growth of the population in Western society during the nineteenth and early part of the twentieth century. These population increments in large measure found their way to colonized countries. The demographic revolution in this way contributed heavily to needs of the cities for an increasing labour force and consumer market.

Duncan⁽¹⁾ believes that, in addition to the importance of technological and demographical factors as a determinant of city growth and urbanisation, development in social organisation is necessary. For, relatively large aggregations of population, argues Duncan, required more complex social organisation, including improved communication, and social and political mechanisms permitting some form of exchange among the emergent specialists, agricultural and non-agricultural.

(1) Otis Dudley Duncan, 'Human Ecology and Population Studies', in Philip M. Hauser and Otis Dudley Duncan (ed.), The Study of Population: An Inventory and Appraisal, University of Chicago Press, Chicago, 1959.

Urbanisation is seen therefore as a product of increasing economic specialisation and advancing technology. Carter, for instance, emphasised this point and argued that "The only way it is possible to advance from a subsistence basis is by specialisation of economic activities. The linkages between specialisms necessitate the accumulation of people and this is a process of urbanisation."⁽¹⁾

Many economic ideas and theories have emphasised this specialisation of activities and linkages between them. The original expositions on the multiplier, for instance, emphasised solely the effect of investment in the capital-goods industries on employment in other sectors of the economy.⁽²⁾ Later, others independently developed a modified and broadened version, the basic/non basic ratio, and maintained that export (basic or city forming) industries were the primary determinants of regional and urban growth.⁽³⁾ The latter notion have been criticised on the basis that there is no reason to believe that exports are the sole or even the most important autonomous variable determining regional (or urban) income⁽⁴⁾. Pfouts⁽⁵⁾, empirically demonstrated that local-market industries, by perpetuating income flow within the city, further generate income and hence development. Secondly, a multiplier effect restricted to export industries would often suppress the development-instigating qualities of local industries that provides inputs for export. Or factories might shift from producing exclusively for local consumption to serving a more extensive area.⁽⁶⁾

(1) Harold Carter, op.cit., P.28

(2) John M. Keynes, The General Theory of Employment, Interest and Money. New York, 1936, PP 113-131.

(3) See Douglass C. North, "Location Theory and Regional Economic Growth", Journal of Political Economy, Vol.63, 1955, PP 243-258.

(4) Charles M. Tiebout, "Exports and Regional Economic Growth" Journal of Political Economy, Vol. 64, 1956, PP 160-164 and 169.

(5) Ralph W. Pfouts, "An Empirical Testing of the Economic Base Theory" Journal of American Institute of Planners, Vol.23, 1957, PP 64 - 69.

(6) For further elaboration see, Walter Isard, Methods of Regional Analysis, Cambridge, 1960. PP. 194 - 205.

To illustrate the multiplier effect on urban growth, the National Resources Committee⁽¹⁾ analysis of the process of urbanisation is quoted. The committee argued that, "...as industry and population in a city increase, and as larger areas, outside the city are brought within the orbit of its influence, the demand for service functions increases. As the industry and business enter the mass production and mass distribution stage, the clerical and managerial functions require a relatively larger personnel. The range of occupations, of income and consequently, of standard of living tends to increase with the size of the city, producing great diversity and contrasts between various sections of the urban population."⁽²⁾

The functional differentiation of cities, more over, proceeds not merely on the basis of industrial specialisation but is conditioned also by the commercial, governmental and social roles which cities assume⁽³⁾. This idea is in the same line of Lampard's view that "City growth is simply the concentration of differentiated but functionally integrated specialisms in national locales. The modern city is a mode of social organisation which furthers efficiency in economic activity."⁽⁴⁾ This idea again is developed in parallels with Rostow's stages of economic development.⁽⁵⁾

Urbanisation is not only an excellent index of economic development and social modernisation but also itself a stimulus of such changes. Hence the second task of this section is to examine the effect of urban areas in general and cities in particular as a stimulus

(1) National Resource Committee, "The Process of Urbanisation: Underlying forces and Emerging Trends" in P.K. Hatt and Albert J. Reiss, op.cit. PP.64-77.

(2) Ibid, P.72.

(3) Ibid, P.73.

(4) E. E. Lampard, "The History of Cities in Economically Advanced Areas" Economic Development and Cultural Change, Vol.3 1955, P.92.

(5) W. W. Rostow, The Stages of Economic Growth, Cambridge University Press, London, 1960.

of economic development. Space does not permit a full treatment of this matter here, but the general ideas and main findings in this respect will be presented.

Indeed, the geographical literature abounds with examples of optimal spatial pattern centering on urban places and of methods of analysis based on distance - decay and gravitational concepts. Examples of the spatial-organisational function of urban places include theories as they have evolved from the original works of Vonthünen, Christaller and Lösch and from diffusion models from Hagerstrand's work, but the relationship of performance with the urban system has only been emphasised by Schultz⁽¹⁾ and in greater detail by Friedmann.⁽²⁾

According to Schultz, "...economic development occurs in a specific locational matrix which is primarily urban and industrial in composition. It is at or near this matrix that economic organisations especially commodity and factor market, work most efficiently."⁽³⁾ Friedmann, on the other hand, is more explicit and claims that "...the spatial incidence of economic growth is a function of distance from the central city, that is, economic growth tends to occur in the matrix of the urban region."⁽⁴⁾

It is clear, however, some apparent differences of emphasis between Schultz and Friedmann in their formulation of ideas on the spatial occurrence of economic development. Logan⁽⁵⁾ argues that Friedmann's statement refers to growth as distinctive from development and is formulated in the context of developing countries, but Friedmann's

(1) T. W. Schultz, The Economic Organisation of Agriculture, McGraw-Hill Book, New York, 1953, P.147.

(2) J. Friedmann. "Regional Economic Policy for Developing Areas" Papers and Proceedings of Regional Science Association. Vol.11, 1963, PP.41-61.

(3) T. W. Schultz. op.cit., P.147.

(4) J. Friedmann Regional Development Policy. A Case Study of Venezuela, The M.I.T. Press, Cambridge, 1966, P.11.

(5) M. I. Logan. "The Spatial Dimensions of Economic Development: A case study of Upper Midwest" op.cit., P.119.

elaborations, emphasise Logan, implies the possible existence of an urban-rural continuum in which levels of economic development are at their highest in or near the large city and are at their lowest at the intermetropolitan periphery.

A number of carefully elaborated empirical studies have given substance to this generalisation. Duncan and others⁽¹⁾, for example, have shown that the value of farm product per acre value of farms and the distribution of non-metropolitan manufacturing are each highly correlated with closeness to the large city. Smith and Copp⁽²⁾ showed that the average value of land and buildings decreased and the average size of farms increased as distance from large places increased. Nicholls⁽³⁾ showed that the impact of urban-industrial growth had the effect of improving agricultural productivity in the immediate vicinity of the urban places. In addition to these scholars, many others⁽⁴⁾ gave substance to this notion.

The generalisation made by Schultz and Friedmann also supported by Boudeville who concluded that Perroux's growth poles were really urban places with agglomeration of key industries.⁽⁵⁾ After Boudeville's work, which began in the late 1950's, a greater recognition of the spatial aspects of economic growth, and in particular, a greater recognition of the role of cities came about.

(1) O.D. Duncan, et.al., Metropolis and Region, John Hopkins, Baltimore, 1960.

(2) H. F. Goldsmith and J. H. Copp, "Metropolitan Dominance and Agriculture", Rural Sociology, Vol. 29, 1964, PP. 385-395.

(3) William H. Nicholls, "Industrialisation, Factor Markets and Agricultural Development" Journal of Political Economy, Vol.69, 1961, PP 310-340.

(4) See for instance, Vernon Ruttan, "The Impact of Urban Industrial Development on Agriculture in the Tennessee valley and the South East", Journal of Farm Economics, Vol. XXXVII, 1955, PP. 38-56; and John Friedmann, The Spatial Structure of Economic Development in the Tennessee Valley, Research paper No.1 Programme for Education and Research in Planning, The University of Chicago, 1955.

(5) M.D. Thomas, "Growth pole Theory: An Examination of some of its Basic Concepts" in N.M. Hansen (ed.), Growth Centres in Regional Economic Development, The Free Press, New York, 1972, PP. 50-81.

As neither the term growth pole nor development pole in the earlier literature necessarily implied an urban location, the term 'growth centre' evolved in order to emphasise the importance of cities.

Accordingly, there is agreement among the authors of the preceeding papers that the growth and development of cities is a necessary condition of economic development. Lampard, in particular, points to the need for greater specialisation of tasks which has been associated invariably with urban centres. Both Lampard⁽¹⁾ and Stolper⁽²⁾ suggest that economic growth becomes impossible beyond a certain point without the development of major cities. Also, Gras has named the economy of the modern world 'metropolitan economy' because of the crucial part played by the great cities in organising and integrating the world commercial, financial and communication arrangements.⁽³⁾

The location decisions of most firms, argued Friedmann, are made with reference to cities or urban region, or as he called location points, due essentially to two reasons⁽⁴⁾. First, says Friedmann, "Cities represent identifiable points in the space economy; from a location stand point, the internal areas of cities tend to be regarded as relatively homogeneous... And it is with respect to cities - as identifiable economic sub-system - that measurements regarding the supply schedules of labour, material inputs, energy and transportation may be taken". The second reason, according to Friedmann, which he regards as more significant, has to do with a category of external economies of agglomeration.

(1) E. E. Lampard, "The History of Cities in Economically Advanced Areas", op.cit., PP.81-136.

(2) W. Stolper, "Spatial Order and the Economic Growth of Cities", A Comment on Eric Lampard. Economic Development and Cultural Change Vol. 3, 1954, PP.137-146.

(3) Rupert B. Vance and Sarah Smith, "Metropolitan Dominance and Integration" in P.K. Hatt and Albert J. Reiss, op.cit. P.104.

(4) John Friedmann, Regional Development Policy, A Case op.cit., PP 28-29.

Hence, cities and towns because of valuable urbanisation and localisation economies⁽¹⁾ tend to be favoured as points of growth. In other words, "...the concept of agglomeration may provide a theoretical understanding of the fairly common occurrence whereby there are essentially neighbouring locations for all firms in a given industry, and eventually, a rationale for the concentration of a majority of business activities in a city core area, or metropolitan region".⁽²⁾

Much has been written on the role of external economies of agglomeration in the growth of urban areas and centres, and most of this has been on the basis of economic variables.

In their classical formulation, Weber⁽³⁾ and Hoover⁽⁴⁾ stressed the importance of agglomeration economies as a locational factor of economic activity. According to Weber, the third locational factor⁽⁵⁾ was the agglomeration (deglomeration) economies and dis-economies which acts, to concentrate or disperse industries within a given region. In the same line, Hoover argued that "...the incentives toward agglomeration of diverse type of business into a relatively small number of clusters at transfer nodes may be assumed up under the head of economies of urban concentrations"⁽⁶⁾.

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- (1) Urbanisation economies, are the saving in overhead costs resulting from common usage of basic facilities by a multiplicity of distinct firms: localisation economies, are the savings resulting from the proximate locations of a number of firms with affinity linkages. (See D. Todd, "An Appraisal of the Development Pole Concept in Regional Analysis" Environment and Planning, Vol. 6, 1974, P.294)
 - (2) D. Barrows et.al., "Office Space Utili ation and Urban Decentralisation" Contact, Vol.8 1976, P.146.
 - (3) A. Weber, Theory of the Location of Industries, translated by C. Freidrich, Harvard University Press, 1926.
 - (4) Edger E. Hoover, The Location of Economic Activity, McGraw Hill Book Ccmpany, New York, 1948, P.120.
 - (5) The two other locational factors according to Weber are: transport cost differentials and labour cost differentials (See W. Isard, Location and Economic Space, The M.I.T. Press, Cambridge, Massachusetts, 1956, P.172.
 - (6) Edger E. Hoover, op.cit., P.120.

In addition to the formulation of Weber and Hoover, many other authors have stressed the importance of external economies of agglomeration as a stimulus of activities to the urban areas (such as Isard⁽¹⁾ who named the external economies, urbanisation and localisation economies).

Hoover argues that a city "...has certain large-scale economies to offer its business enterprises."⁽²⁾ He notes that "...in addition to the advantages of better transfer services and a broader, more flexible labour market, there are many kinds of auxiliary services catering to business in general - bank, utilities, fire and police protection, and others - which can do a more effective job in large communities. Interest, property insurance, and utility rates are generally lower in large cities."⁽³⁾

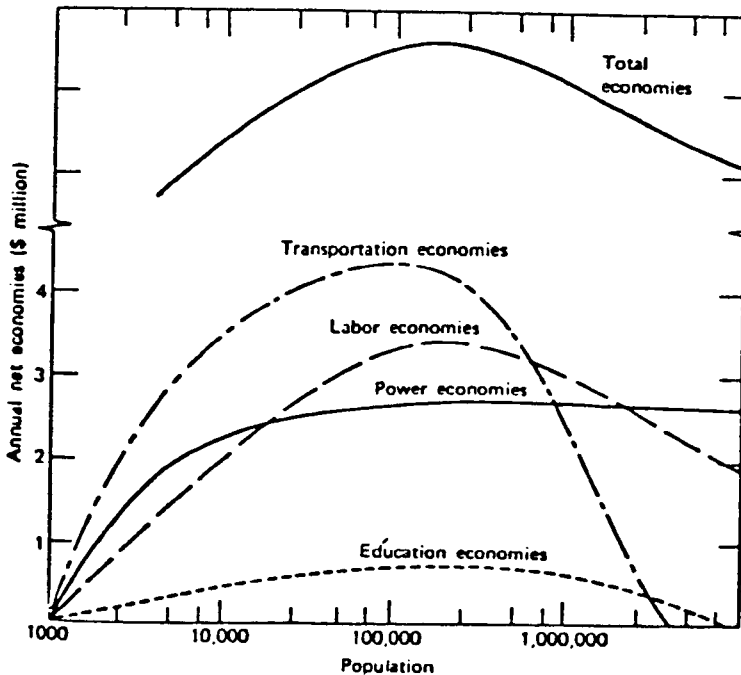
Isard illustrates economies of scale with urban size hypothetically in a diagram reproduced here as figure (2.3). This figure shows economies rising as city size increases to a certain point, beyond which diseconomies of scale begin to operate.

Other advantages of towns and cities as a locational points of non agricultural activities are: the greater variety of skills and occupational specialists which can be found there;⁽⁴⁾ Uncertainty is minimised;⁽⁵⁾ Personal contact is utilised especially in transitional societies where communication systems are scarce or unreliable⁽⁶⁾; and it is seen as the agent for the introduction of

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- (1) Walter Isard, Location and Economic Space, op.cit. PP.176-188: For other details on the subject see: D.F.Darwent, "Growth Poles and Growth Centres in Regional Planning - A review" Environment and planning, Vol. 1, 1969, PP.22-23; David S. Smith, Industrial Location, An economic Geographical Analysis, John Wiley & Sons Inc., New York, 1971, PP.82-88; and J. R. Lasuen, op.cit. PP.172-175
- (2) Edger Hoover, op.cit. P.120.
- (3) Ibid, P.120.
- (4) Bert F. Hoselitz, op.cit. P.162 Also see John Bale, The Location of Manufacturing Industry. Oliver and Boyd, Birkenhead, 1976, P.88.
- (5) D. F. Darwent op.cit. P.22.
- (6) Ibid, P.23.

Figure (2.3)

Hypothetical Economies of Scale with Urban
Sizes



Source, W.Isard, Location and Economic space, op.cit.Fig.35,P.187

new ideas, for the development of innovations, and for social change generally.⁽¹⁾

The most extensive empirical study of the nature of these external economies was given in an analysis of the economy of the New York Metropolitan Region.⁽²⁾ From this study it would appear that these external economies are basically of two kinds: In the first place there is the reduction in uncertainty which comes from

(1) M. I. Logan, "The Spatial System and Planning Strategies..." op.cit.,P.288.

(2) Raymond Vernon, Metropolis 1985 Cambridge, Mass. Harvard University Press, 1960, P.101.

location in a large city in close proximity to many possible sources of information. The second type of external economies result from the availability of variety of specialised facilities and services⁽¹⁾ in the large city.

An intensive examination of the role of city sizes and distributions on the economic development, in general, and the association between city-size and external economies of scale, in particular, will be made in the following two chapters. This examination will be supported with empirical evidence wherever that is possible.

2.3. Industrial Development as a Main Cause of Urbanisation

Industrial development or industrialisation which means the introduction of so-called secondary industries on a considerable scale⁽²⁾, was the main cause of development of advanced countries, and it is, as stressed by Chenery⁽³⁾ and other scholars, the main hope of the most poor countries trying to increase their level of income. It is also the most controversial aspect of the problem of economic development.

The so-called theory of development stages was largely founded on the empirical observations of Clark and Fisher. In essence the theory shows that, "...as per capita income grows, there is a general decline in the proportion of the working force engaged in agriculture. Such a decline is at first accompanied by a growth in the proportion of the working force engaged in secondary industries, primarily manufacturing. Later, tertiary or service industries expand and increase their share of the total working force."⁽⁴⁾

(1) For details and examples of these specialised facilities and services and advantages of Metropolitan location see, R. M. Lichtenberg, One-Tenth of a Nation, Cambridge Mass. Harvard University Press, 1960, P.67: and John Friedmann, Regional Development Policy, A case... op.cit. P.29.

(2) Edger M. Hoover and Joseph Fisher, "Research in Regional Economic Growth", Universities-National Bureau Committee for Economic Research, New York, National Bureau of Economic Research, 1949, P.182.

(3) Hollis B. Chenery, "The Role of Industrialisation in Developing Programmes" in A.N. Agarwala and S.P. Singh (ed), op.cit. P.451.

(4) Morgan D. Thomas, "Regional Economic Growth and Industrial Development" Regional Science Association: Papers X, Zurich Congress, 1962, PP.61-62

No definite criteria are known to classify a specific country as an industrialised. This proposition differs from country to another and by time. Clark emphasised this point and argued that "It is not however necessary, for the purposes of defining an industrial country, that the greater part of the working population should be engaged in manufacture. Indeed, in the wealthiest industrial communities the proportion so engaged is low, and tending to fall further, with up to 70 percent of the labour force, in some instances, being engaged in service industries. Nor is it a necessary concept that such a country should produce the whole range of manufacture. Some of the smaller industrial countries are highly specialised, and obtain the greater part of their requirements of manufactured goods by exchange with other countries. But nevertheless it is essential to our concept of an industrial country that it should have a substantial number of efficient manufacturing industries, on whose existence indeed its economy depend".⁽¹⁾

Industrialisation which is a main vehicle of development, in turn, is associated with urban growth, and the relationship of these two processes is usually assumed to be so close that some writers speak of industrialisation and urbanisation as two facets of one and the same process. Myrdal, for instance, emphasised that "...industry was and in the developing countries still is, the chief vehicle of urbanisation."⁽²⁾ He adds that "... the intensive nature of industrial activity explains the concentration of the labour force and auxiliary services in towns, localising there consumer and industrial markets which attract other industries and services, and unleashing a process of circular and cumulative causation".⁽³⁾

(1) Colin Clark, Population Growth and Land Use, MacMillan and Co. Limited, London, 1967, pp.284-285.

(2) Gunnar Myrdal, "Rich Lands and Poor" World Perspectives, New York Vol.16, 1957, P.13.

(3) Ibid, P.13. Myrdal cumulative causation model will be discussed in some details in chapter three.

Thompson⁽¹⁾ and Pred⁽²⁾, also built models to explain urban-industrial growth. Because Thompson's work is based on broad synoptic vision of urban industrial growth, while that of Pred, who attempted to explain the growth of American cities in the period 1800 to 1914 is more concerned with relating theory to empirical evidence and attempts to identify the factors causing urban growth more precisely, will be quoted here as an explanation of urban-industrial growth.

Utilising Myrdal's cumulative causations model⁽³⁾ of spatial development transformation, Pred puts forward a similar model to explain urban and industrial growth.⁽⁴⁾ In his model, Pred invites us to imagine a mercantile city, perhaps on the Eastern Seaboard of the USA, and to imagine that either by chance or design a factory is established in the city. He argues that this will set off two chain reactions . First, new manufacturing functions, whether or not they primarily serve local markets, will have an initial multiplier effect; that is, new local demands created both by the factories themselves and by the purchasing power of their labour force will generate a host of new businesses: Service, trade, construction, transportation, professional, and miscellaneous white-collar jobs. He argues that the combined effect of new industrial employment and an initial multiplier effect will be an increase in population, or growth in urban size, and the probable attainment of one or more new local or regional industrial thresholds. The higher thresholds will support new manufacturing functions as well as additional plants in existing industrial categories.

(1) W. R. Thompson, A Preface to Urban Economics, Baltimore, John Hopkins Press, 1965. Also see, Geoffrey Edge, "The Economic Causes of Growth in Industrialised Societies", in Urban Development Unit 10-14, op.cit. PP.35-37

(2) Allan Pred, "Industrialisation, Initial Advantage, and American Metropolitan Growth", in John Blunden et.al.(ed), op.cit. P.179 The Model first built in 1966 and presented in Pred's research. The Spatial Dynamics of U.S.Urban Industrial Growth, 1800-1914. Cambridge, Mass., M.I.T.Press, 1966.

(3) Gunnar Myrdal, Economic Theory and Under developed Region, Gerald Duckworth, London, 1957.

(4) Allan Pred, "Industrialisation,...", op.cit. pp.179-180.

Pred's model goes beyond that and argues that, once production facilities have been constructed in accordance with the new thresholds, a second round of growth is initiated, and eventually still higher thresholds are achieved. Plant construction in response to these thresholds again generate a multiplier effect and higher thresholds and the process continues in a circular and cumulative manner until interrupted or impeded.

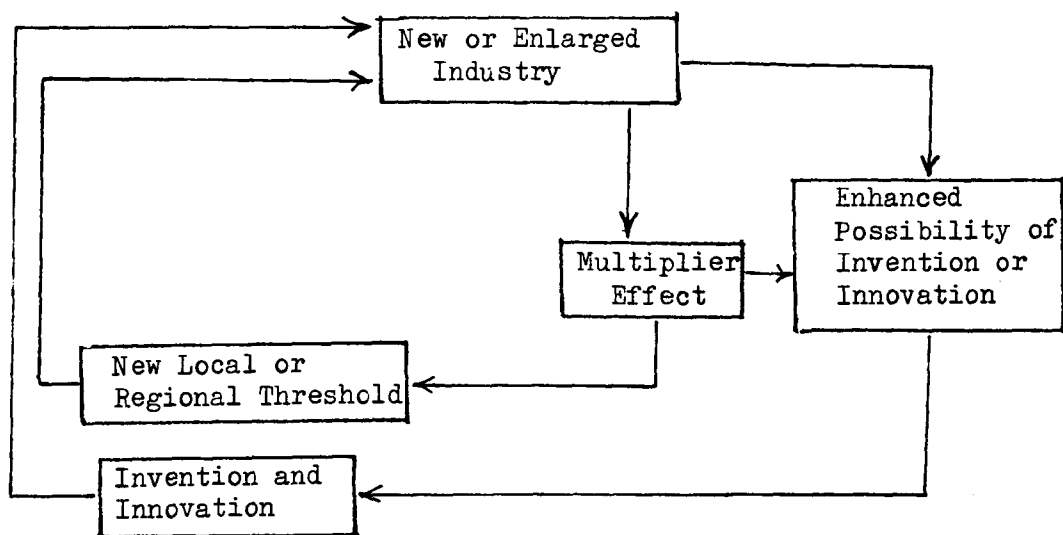
The second chain reaction, argues Pred, will occur at the same time and compounds and reinforces the effects of the first. This chain stems from the continually more complex network of interpersonal communications and confrontations that derives from an expanding population. The multiplication of interactions among the growing number of individuals engaged in the manufacturing and tertiary sectors enhances the possibilities of technological improvements and inventions, enlarges the likelihood of the adoption of more efficient managerial and financial institutions, increases the speed with which locally originating ideas are disseminated and eases the diffusion of skills and knowledge brought in by migrants from other areas. Once implementation has occurred⁽¹⁾ - that is, once new factories have been erected or old ones enlarged - employment and population increase, the web of interpersonal communications is again extended and densened, the chances, for invention and innovation are further enhanced, and the circular process continues, perhaps even at an accelerated pace, until diverted or hindered.

The following figure illustrate the Pred model of circular and cumulative process of industrialisation and urban-size growth.

(1) Schumpeter argues, that, inventions and ideas are not immediately implemented but await an imaginative entrepreneur to exploit them. See Joseph A. Schumpeter, The Theory of Economic Development, Translated by Redvers Opie, New printing, New York, 1961, P.9 and 64.

Figure (2.4)

Pred Circular and Cumulative Process of Industrialisation
and Urban-Size Growth



Source, Allan Pred, "Industrialisation, Initial Advantages...."
op.cit., Figure 16, P.179.

According to Pred's model, all urban centres once they acquired their initial factory, will undergo an upward spiral of industrial and population expansion. Nevertheless, it should be noted that despite the crucial importance of industrial development in urban growth, in reality most towns manage to acquire some industrial functions, and not all industrial centres reach metropolitan size. Indeed, Pred realises this fact and sets out to explain differences in the size of urban-industrial centres by examining the ideas of initial advantage and transport systems.⁽¹⁾

However, the close association between industrialisation and urbanisation is historically confirmed through the fact that the advanced countries contain the most heavily industrialised and at the same time most densely urbanised regions of the world. In the developed countries during their period of industrialisation and urbanisation, the shift from agricultural to manufacturing employment, on the one hand, and

(1) Geoffrey Edge, op.cit., P.38.

urbanisation, on the other hand, was so close that the economic historian Clapham pointed out that "...the best general test of industrialisation of nation's life under the modern conditions is the rate and character of the growth of its towns."⁽¹⁾

The figures in table (2.5) illustrates the parallel course of industrialisation and urbanisation in Britain in the nineteenth century. Since the nineteenth century, the proportion of population in agriculture in Britain has continued to fall, reaching less than three percent in 1970. The proportion of people in towns of 20,000 and above has continued to increase. Thus by the 1950's and 1960's it could be said that Britain was almost a completely urbanised society.⁽²⁾

Other developed countries have followed the same path. In 1965, the proportion of the occupied population in agriculture was 6.5 percent in the USA, 17 percent in France, 11 percent in Germany, 25 percent in Italy and 24.3 percent in Japan.⁽³⁾

Davis and Golden, realise this parallel correlation between the two processes. They argued that "...if we take as undeveloped, or pre-industrial, all areas with more than 50 percent of their occupied males engaged in agriculture, we find that only 9 percent of their combined population lives in cities of 100,000 or over, whereas for the other countries (industrial) the proportion is 27 percent."⁽⁴⁾ It follows that these parts of the world still mainly in the peasant-agrarian stage of economic development manifest the least urbanisation.⁽⁵⁾

(1) J. H. Clapham, The Economic Development of France and Germany, 1815-1944. Cambridge University Press, 1948, P.54.

(2) Frank Knox, op.cit., P.15.

(3) Ibid, P.15.

(4) Kingsley Davis and Hilda Hertz Golden, op.cit., P.122.

(5) Ibid, P.122.

Table (2.5)

Industrialisation and Urbanisation in Britain
in Nineteenth Century

Year	Total Population (000's)	Percentage Living* in Towns of 20,000+	Percentage of* Working Population in Agriculture, Forestry and Fishing
1801	8.893	16.9	-
1811	10.164	18.1	35
1821	12.000	20.8	33
1831	13.897	25.1	28
1841	15.914	28.9	22
1851	17.928	35.0	22
1861	20.066	38.2	19
1871	22.712	42.0	15
1881	25.974	48.0	15
1891	29.002	53.4	11

*The figures are subject to a number of qualifications - those for the towns population relate to England and Wales, and those for the occupational distribution to Great Britain.

Source, Frank Knox, op.cit., Table (2), P.14.

A continental breakdown, as given in table (2.6) shows that Asia (excluding the USSR) and Africa are the most agrarian and the least urbanised countries.

Table (2.6)

Percent of Population in Cities and in Agriculture
in Major World Areas (1950)

Continent	Percent of Economically Active Male Engaged in Agriculture	Percent of Pop. in Cities 100,000+
World	60	13
North America	17	29
Oceania	35	41
Europe	38	21
USSR	54	18
South America	62	18
Central America and Caribbean	69	12
Asia	70	8
Africa	78	6

Source, Kingsley Davis and Hilda Hertz Golden, Ibid., Table 2, P.123

Using correlation coefficient analysis, Davis and Golden, taking the countries and territories of the world as their units, found that a very high and positive association exist between industrialisation and urbanisation. It took the order of (0.86), as of 1950.

Although industrialisation and urbanisation go usually hand in hand, most scholars of urbanisation argues that there is no necessary connection between the two processes. Hoselitz, for instance, emphasised that "Industries can be and have been established in rural districts, and cities have grown up without large industrial plants."⁽¹⁾

⁽¹⁾ Bert F. Hoselitz, "The City, The Factory and Economic Growth, in P. K. Hatt and Albert J. Reiss (ed), op.cit., P.538. Also see, in the seamline, Rudolf Heberk, "Social Consequences of the Industrialisation of Southern Cities", in P. K. Hatt and Albert J. Reiss (ed), op.cit., P.446; and Bert Hoselitz, Sociological Aspects of Economic Growth, op.cit., P.163.

Some writers, goes beyond that, and argues that in recent decades urbanisation has been loosely related to industrialisation. Pred, for instance, argues that "...comes the time when tertiary activities supplant manufacturing as the principle determinants of urban-size growth."⁽¹⁾ He adds "in USA...before 1910 industry rather than commerce was the chief source of urban growth...the urban growth since world war one has been perpetuated more by tertiary activities than by manufacturing is most clearly reflected by the fact that the percentage of population gainfully employed in the latter has been decreasing at the expense of the former."⁽²⁾

The findings of Mill's, supported this idea. He found that, "in the United States, for example,....., about 25% of the labour force has been engaged in manufacturing since about 1920, whereas the urban population has grown from about half to nearly three-quarters of the total during that half century."⁽³⁾ Hence from that time it became apparent "...the factors involved in metropolitan growth...were primarily commercial and institutional, with industry playing a relatively smaller role."⁽⁴⁾

Economists, argued Pred "...usually attribute this shift in sectoral employment to the different income elasticities of demand for the goods and services of industrial and tertiary activities, and to simultaneous increases of real product per man-hour in manufacturing greater than those in other sectors of the economy."⁽⁵⁾

(1) Allan Pred, "Industrialisation,..", op.cit., P.177.

(2) Ibid, PP.177-178.

(3) Edwin S. Mills, "Welfare Aspects of National Policy Toward City-Sizes" Urban Studies, Vol. 10, 1972, P.119.

(4) R. D. Mackenzie, "The Rise of Metropolitan Communities", in Recent Social Trend in the United States: Report of the President's Research Committee on Social Trends, New York, 1933, Vol.1, P.493.

(5) Allan Pred, "Industrialisation...", op.cit., PP.178-179

Last but not least, Reissman emphasise that "...it is evident that not all countries move in the same direction or in the same manner to urbanisation; some countries begin with industrialism, but others experience city growth and industrialism follows. Other countries begin the process by the creation of nationalistic ideologies and then move to urbanisation and industrialisation."⁽¹⁾ Urbanisation literature provide ample evidence of such differences, especially if the comparison is made on a macro scale, i.e. urbanisation experience of developed countries against that of developing ones. However, the following section elaborates on such differences.

2.4. Urbanisation in Developing Areas and the Differences in the Urbanisation of Developed and Developing Countries

The present concentration of urbanisation in the advanced nations is almost wholly a product of the last 150 years, while the developing countries are now passing through a very rapid urbanisation process, which some writers labelled an 'Urban Revolution'.⁽²⁾

Although the developing areas of the world are less urbanised than the advanced countries and although Weber's statistics showed urbanisation beyond western Europe and North America to be limited in 1899 in both scale and extent to the tentacles of colonial expansion,⁽³⁾ Davis and Golden argued that "...the concentration of urbanisation in industrial area should not lead us to believe that most of the cities and most of the city people are found in this area, as is commonly thought."⁽⁴⁾ They emphasise that "The hiatus in the rate or degree of urbanisation between the advanced and non-advanced parts of the world,

(1) Harold Carter, op.cit., P.30.

(2) Alan B. Mountjoy, "Urbanisation, the Sequater, and Development in the Third World," in L. S. Bourne and J. W. Simmons (ed), Systems of Cities, Reading on Structure, Growth and Policy, Oxford University Press, New York, 1978, P.480.

(3) Brian J. L. Berry, The Human Consequences....., op.cit., P.74.

(4) Kingsley Davis and Hilda Hertz Golden, op. cit., P.123.

however, is but a temporary phenomenon - a lag due to time required for the geographical and cross cultural spread of a radically new type of economic and social organisation."⁽¹⁾

In recent decades, urbanisation rates shows to be higher in developing countries than in developed ones. Both Berry and Davis and Golden emphasised this fact. Berry, for instance, found that as part of the quadrupling of the world's urban-population during the last 50 years, the developed regions increased their urban population by a factor of 2.75 (that is, from 198 to 548 millions), while the developing countries increased their urban population by a factor of 6.75 (from 69 to 464)."⁽²⁾ In both Latin America and Africa the urban population increased eight folds.⁽³⁾ Davis and Golden findings, also go in the same line with that of Berry. They found that the rate of growth of advanced countries cities has begun to slacken. At the same time that this has been happening in industrial areas, the rate of urbanisation has been increasing in most developing areas, see figures (2.5) and (2.6). This of course could be attributed to the already high degree of urbanisation achieved in developed countries.

In addition to the increase in the rate of urbanisation in developing countries, Davis and Golden found that '...the developing countries have more people (160 millions) living in cities of 100,000 or more than do the industrialised nations (155 millions)."⁽⁴⁾

(1) Ibid, P.125.

(2) Brian J. L. Berry, The Human Consequences..., op.cit., P.74.

(3) Ibid, P.74.

(4) Kingsley Davis and Hilda Hertz Golden, op.cit., P.123. In the same line see also, Kingsley Davis, "The Urbanisation of Human Population", op.cit., Figure (3), P.9.

Figure (2.5)

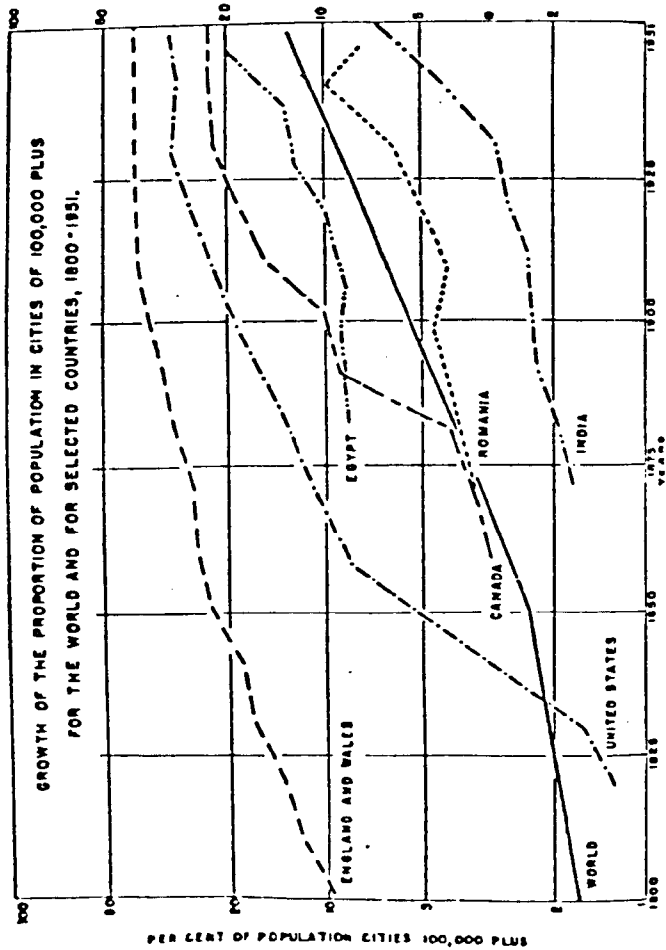
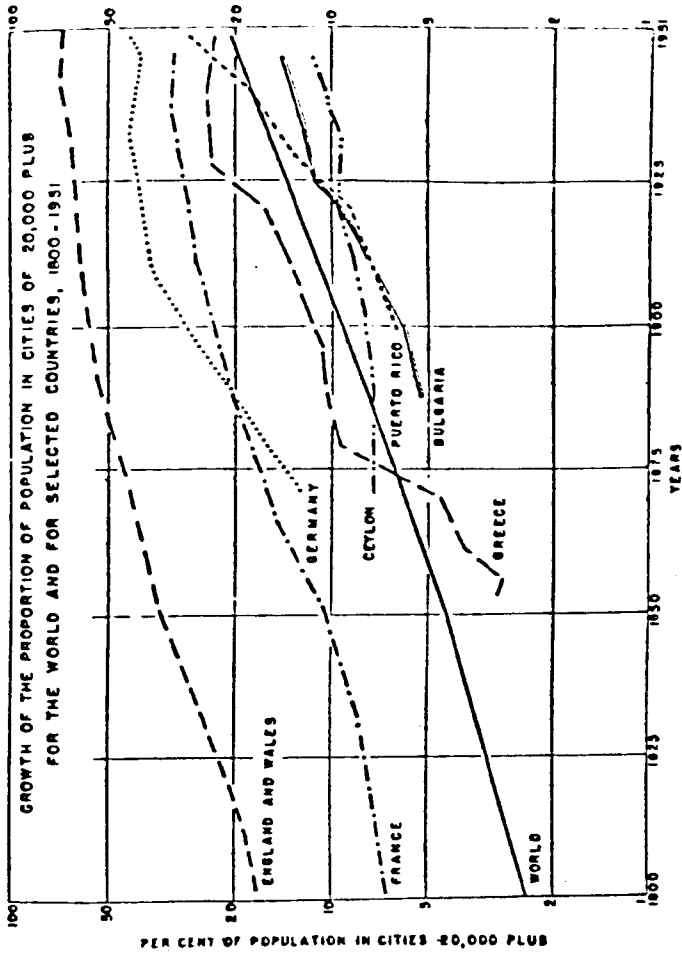


Figure (2.6)



Source, Kingsley Davis and Hilda Hertz Golden, op.cit., Figures (1) and (2), PP.127 and 128.

The United Nations Demographic Year Book includes lists of cities of over 100,000 inhabitants. Between 1960 and 1970 the number of such cities in the developing world increased from 249 to 837, a 336 percent increase.⁽¹⁾ This indication of the high rate of urbanisation in the developing countries is reinforced if data on cities with over 500,000 inhabitants is extracted. The 500,000 city-size population in the developing countries increased ninefolds during the period 1920-1960, as compared to 0.6 times for Europe and 2.4 times on other developed regions (Japan, North America, Soviet Union, Temperate South America, Australia, and New Zealand).⁽²⁾

As a result of the accelerated urban growth experiencing in the developing countries, it will encompass 51 per cent of the world urban population by 1980 against 25 percent in 1920.⁽³⁾

However, the important aim of this section is to explore the main causes, characteristics and consequences of urbanisation in developing countries. For although there are many similarities with respect to urbanisation in the advanced countries and the present developing countries, there are also important differences. The differences merit attention for at least two reasons; First, they demonstrate that it may be hazardous to assume that all of the patterns of urbanisation observed in the past in the advanced areas will necessarily apply in the future to the developing regions, and; second, critical examination of the process and impact of urbanisation in the developing areas may provide a basis for testing the generalisations and the hypothesis in respect of urbanisation derived from experience of the West.

(1) Alan B. Mountjoy, op.cit., P.480.

(2) Brian J. L. Berry, The Human Consequences..., op.cit., P.74 and Table (4), P.76.

(3) Ibid, P.74.

Among the differences between urbanisation in the advanced areas, at the time they began to urbanise, and the developing regions nowadays, the following could be stressed: differences in the world political situation at the present time compared with that prevalent when the advanced nations first experienced rapid urbanisation; differences in the forces making for urbanisation; differences in the ratio of population to resources and levels of living; and differences in basic outlook and value systems.

Hauser, elaborates on such forces encountered the urbanisation process in developed and developing areas and argued that:⁽¹⁾

1. As a result of changed world political framework, it may be anticipated that the increased use of Central Planning in developing areas is also likely to contribute to different patterns of urbanisation than that observed in the West. It is possible that many of the problems of Western urbanisation may be avoided or ameliorated. But it is also possible that new and equally difficult types of problems will be encountered;

2. Differences in the urbanisation of the present developing areas may arise also from their colonial heritage. In many of the countries in Asia, Latin America, and Africa, cities are more the product of colonial experience - that is, the result of exogenous factors - than indigenous economic development;

3. The third force making for differences in urbanisation between the present advanced and economically developing areas is found in the fact that the developing regions now have available to them twentieth century technology; and

(1) Philip M. Hauser, op.cit., PP.34-38.

4. In most of the developing areas today the ratio of population to resources is much higher than that which prevailed at the beginning of the industrialisation and urbanisation of the West. More over, they are experiencing a more rapid decline in mortality than was ever experienced in the Western World and consequently more rapid rates of population increase.

These and other forces encountered the urbanisation process in the developing areas create a great differences between urbanisation in these areas and urbanisation in the advanced areas during their first stages of development and urbanisation. The main differences could be summarised as follows:-

1. Although the urbanisation process at the early stages of development in advanced countries characterised by the creation and growing of modern industrial towns and cities, there are hardly any genuine industrial cities in the developing countries. Hoselitz emphasised this point and argued that "...the very fact in these countries more than half the males are occupied in agriculture, fishing, or forestry explains the scarcity of genuine industrial cities in these countries."⁽¹⁾ Hence, though such cities as Kampur or Ahmedabad in India, Maracaibo or Monterrey in Latin America, and Dharan in the Middle East may be regarded as genuine industrial cities, the majority of the cities of developing countries perform numerous central city functions and industry plays often only a relatively subordinate role.⁽²⁾ However, it should be noted that the western pattern of functional specialisation of cities have been adopted in developing countries. Hoselitz in another work, stated that "Western pattern of urban growth and functional specialisation of cities have been adapted in non-European countries and the same functional types can be distinguished."⁽³⁾

(1) Bert F. Hoselitz, "The City, the Factory,..." op.cit., P.543.

(2) Ibid, P.543.

(3) Bert F. Hoselitz, Sociological Aspects of...., op.cit., PP.219-220.

Thus, we find today mining towns or manufacturing towns or commercial towns in Asia, Africa and Latin America.

2. One of the great contrasts between the urbanisation of the developing countries and that of the advanced is the absence of what Hoselitz called "City-Consciousness"⁽¹⁾ in Asia and Africa and perhaps also in Latin America. This implies; "...that the distance between urban and rural styles of life is less pronounced than in Europe; that the loyalties of the urban dwellers are frequently to groups whose centre of gravity is outside the city; that the sojourn in the city is regarded often as only temporary; that migrants to the city from one village or province not only tend to settle in clusters in their own, but that even when they have become permanent city dwellers they maintain some ties with the region they come from; and that each district of the city forms a community of its own, often vigorously separated from the others."⁽²⁾

The consequences of this fact are of considerable gravity. Most of European migrants to the cities in the eighteenth and nineteenth century came from the countryside, just as the migrants to cities of underdeveloped countries today. But whereas the European, once he had reached the city and lived there for a short time was able to cut himself loose from his old home because he found a new home with new loyalties in the city, the Asian or African does not experience such a transfer of loyalty. He continues to "belong" to the place whence he came and he never feels fully and exclusively at home in the city.⁽³⁾ Hoselitz believes that the urban environment in the developing countries created

(1) Bert F. Hoselitz, "The City, The Factory,..." op.cit., P.545.

(2) Ibid, PP.545-546. (The differences listed above, were pointed out almost twenty-five years ago by Max Weber when he concluded, as a result, of examining the peculiarities of Chinese, Indian, and Arabic cities, that "Only the West has known an urban community in the true sense of the word as a mass phenomenon." (Ibid, P.546)

(3) Ibid, P.546.

such behavioural pattern. He argued that "...the urban environment in under-developed countries has the effect of increasing greatly the anxieties and the uncertainties of the recent migrants, to make him look for security in familiar surroundings, and to seek out associations in which familiar patterns of social structure, authority and responsibility prevail."⁽¹⁾

3. The third and most important characteristic of urbanisation in developing countries, on which there is a general agreement among scholars of urbanisation and development, is that economic development, in general, and industrial development, in particular, lags far behind the rate of urbanisation.

Berry, for instance, stresses this point and argued that "while in the West, urbanisation involved gradual innovation and interdependent economic and social change spanning more than a century. Contemporary Third World urbanisation involves greater numbers of people than it did in the West. Migration is greater in volume, and more rapid. Industrialisation lags far behind the rate of urbanisation, so that the bulk of the migrants find at best marginal employment in the cities."⁽²⁾ Berry adds, "the most pressing problems associated with third world urbanisation arise because, despite accelerated industrialisation, the rapidly increasing labour force of cities is not being absorbed into full and productive employment."⁽³⁾ With urban growth rates typically running at least twice the rate of natural increase, frequently in excess of 5.0 percent per annum, but with industrial employment increasing at 4.4 percent per annum, the bulk of new manpower is absorbed by small-scale enterprise, personal services, and open unemployment. Moreover, spurts in urban investment tend only to bring more

(1) Ibid, P.547.

(2) Brian J. L. Berry, The Human Consequences...., op.cit., P.74-75

(3) Ibid, P.91.

migrants to the city. Several consequences, argued Berry, follow from these facts: "...maintenance of a minimal 'Survival economy'; the reinforcement of traditional subcultures in the city, the prevention of diffusion of development beyond the big cities and the creation, thereby, of growing primacy of the major urban agglomerations."⁽¹⁾

All these characteristics and consequences of urbanisation in developing countries identified by Berry, have been stressed by other scholars of urbanisation. Hauser, among others, emphasised that "Accelerating urban growth in many of under-developed areas...is not so much the product of economic development and the pull of population into cities from rural areas but rather is the result of the pushing population from troubled and insecure rural areas."⁽²⁾

The position that developing areas are in this sense over-urbanised⁽³⁾ has been challenged among others by Sovani⁽⁴⁾ who also marshals data which tend to refute the contention that rural push is a major factor in urban growth in developing areas. Bairoch also found that "...between 1950-1970 migration from rural areas have been responsible for 45 to 55 percent of the increase in urban population in the non-communist, under-developed countries."⁽⁵⁾ He adds, ..."the over-population of agricultural land has pride of place amongst the push factors, the higher level of urban incomes forms an essential element in the pull factors."⁽⁶⁾

(1) Ibid, P.91.

(2) Philip Hauser, op.cit., P.37. In the same line see also Bert Hoselitz, The City, The Factory...., op.cit., P.547; Paul Bairoch, op.cit., P.144. The latter argued that "...after 1930 a new phenomenon which might be termed urbanisation without industrialisation began to appear in the third world. This phenomenon very rapidly acquired an inflationary character and in the early 'sixties' began to present most serious problems of urban unemployment and under employment; "and Frank Knox, op.cit., P.19.

(3) Over-Urbanisation or as called by Paul Bairoch "Hyper-urbanisation", come into use about twenty years ago. In particular it was at the heart of the discussions at the joint U.N. and UNESCO Seminar in Bangkok in 1956. See, Paul Bairoch, op.cit., footnote No. 11, P.234.

(4) N.V. Sovani, "The Analysis of Over-Urbanisation" Economic Development and Cultural Change, Vol.12, 1964, PP.113-122.

(5) Paul Bairoch, op.cit., P.151.

(6) Ibid, P.152.

This was not the case in the modern industrialised countries after their take off period. The dualistic structure of most developing economies is believed to be the main cause of such urbanisation pattern. However, it should be noted that the causes of over-urbanisation could differ from one country to another and could not only attributed to the above mentioned factors.

4. As a result of the above characteristics of urbanisation in developing countries, it is clear, that urbanisation in this area has not been associated with dramatic increases in levels of living as in the West, where the city was a consequent of, and antecedent, to increased productivity.

The levels of living in the economically advanced areas were higher at their point of take-off in economic development than is prevalent in the developing regions today.⁽¹⁾ Bairoch⁽²⁾, who elaborated on this aspect, found that the gap in the level of income per capita at approximately similar stages of urbanisation in developed and developing countries is about 90 per cent, which he argues, is very much more than any margin of error which can be attributed to the data.

This situation coupled with the fact that urban growth in developing areas may be more a result of push of population from the impoverished countryside than the pull of population to urban areas by reasons of greater economic opportunity and productivity, may help to account for the relatively low level of living found in urban places in the developing regions.

5. The growing primacy⁽³⁾ of the major urban agglomerations has

⁽¹⁾ Philip Hauser, op.cit., P.39.

⁽²⁾ Paul Bairoch, op.cit., P.150.

⁽³⁾ Primacy is simply the dominance of a city (or a few cities) over the other cities in a given nation, or as stated by Friedmann, "...the dominance of the space economy by a single urban region.." (John Friedmann, Regional Development Policy, A Case...., op.cit. P.35. It is the consequent of the concentration of economic development, and correspondingly population in a particular area. For examples of primate cities in developing countries, see, Mark Jefferson, "The Law of Primate City", Geographical Review, Vol. 29, 1939, PP 226-232.

also been stressed by several scholars. Hoselitz, for instance, stated that "In the industrially less-developed countries, the 'law of primate cities' in its more extreme form appears to hold. In fact, in some under-developed countries this 'law of the primate city' is so strong that apart from a capital which may have a million inhabitants or more, there are no other large cities..."⁽¹⁾

However, many other scholars stress that primacy could be found in both developed and developing countries during the early stages of development. El-Shakhs⁽²⁾, for instance, in a recent study found that the association between concentration of population and development emerge during the early stage of development. The most important conclusions to be drawn from this study were that; primacy and non-primacy could be found in both developed and developing countries; primacy and regional inequalities are two major by-products of the development process; and primacy and inequality are found to emerge during the early stage of development. Myrdal, Hirschman, Friedmann and Richardson all stressed that concentration is associated with the early stages of development. The ideas of the first three scholars will be discussed in detail in the following chapter. An important thesis of Richardson that pervades the whole book is that "after a phase of initial concentration associated with the beginning of industrialisation process... sustained national growth is associated with dispersion into different areas of the economy, and that at a later stage of development associated with transportation improvement and higher income levels metropolitan growth is accompanied by decentralisation."⁽³⁾ On another occasion, Richardson also stressed that "The growth of big cities, or the concentration process is probably a necessary phase in economic

(1) Bert Hoselitz, Sociological Aspects...., op.cit., P.209.

(2) S. El-Shakhs, "Development, Primacy and System of Cities," Journal of Development Areas, No. 7, 1972, PP 11-35.

(3) Harry W. Richardson, Regional Growth Theory, John Wiley and Sons, New York, 1973, P.8.

development simply because it facilitates the accumulation of capital."⁽¹⁾

Hence, in general, there is a general agreement among scholars that primacy increases and regional inequalities are intensified during the early stages of development until a 'mid-point' in the development process is reached, after which primacy and inequalities begin to decline.⁽²⁾

The choice between centralisation or decentralisation policies of economic development and urban growth depend on the aims and objectives to be achieved from the adaptation of such policies. For while centralisation policy achieve a maximum rate in the growth of the national product, a decentralisation strategy aims at the redistribution of income in favour of the poorer regions of the country, that is, it emphasises the welfare aspects of development.⁽³⁾ Such controversy

- (1) Harry W. Richardson, "The Argument for very Large Cities Reconsidered, A Comment", Urban Studies, Vol. 13, 1976, P.309
- (2) For detailed arguments of these generalisations, see Rasool F. Al-Jabiri, The Examination of Selected Theories and Models of Urban and Regional Development, with Particular Reference to their Possible Applicability in the Basrah Region of Iraq, Unpublished Ph.D.Thesis, University of Manchester, June, 1978, P.16.
- (3) Justification of such argument and a detailed argument on the advantages and disadvantages of centralisation policies, see for instance; William Alonso. "Urban and Regional Imbalances", Economic Development and Cultural change, Vol. 7, 1968, PP 1-14 (reprinted as Chapter 28 in John Friedmann and William Alonso (ed), Regional Policy: Reading in Theory and Applications, Cambridge, MIT Press, 1975, PP.622-635) and "Equity and its Relation to Efficiency in Urbanisation", in John F. Kain and John R. Meyer (ed), Essays in Regional Economic, Harvard University Press, 1971, PP 40-57; A. R. Kuklinski, "Regional Development, Regional Policies, and Regional Planning; Problems and Issues", Regional Studies, Vol.4 1970, PP. 269-278; J. G. Williamson, "Regional Inequality and the process of National Development: A Description of the Patterns", in L. Needleman (ed), Regional Analysis, Penguin Book Ltd. England, 1972, PP. 99-158; B.E.Coates et.al. Geography and Inequality, Oxford University Press, Oxford, 1977, PP.120-122; Allen Gilbert, "The Argument for very large Cities Reconsidered", Urban Studies, Vol.13 1976, PP 27-34, and "The Argument for Very Large Cities Reconsidered, A Reply", Urban Studies, Vol. 14, 1977, PP.225-227; Peter L. Simons and Noel G. Lonergan, "The Mythical Arguments for Decentralisation", Royal Australian Planning Institute Journal, Vol.11, 1973, PP.146-147; G. H. Searle, "A Re-Examination of the case Against Decentralisation", Royal Australian Planning Institute Journal, Vol.12, 1974, PP.58-62; G. Manners, "Urban Expansion in the United States", Urban Studies, Vol. 2 - 3, 1965, P.53; and R.G. Estall and R. Ogilvie Buchanan, Industrial Activities and Economic Geography, Hutchinson and Co-Publisher Ltd., London, 1964, P.106.

on the costs and benefits that could be achieved from these two different strategies encouraged some scholars to think of a strategy which combines the benefits of both. To get the benefits of both concentration and dispersal policies Rodwin, has suggested a strategy of "concentrated decentralisation."⁽¹⁾ This synthesis, argues Friedmann, "...recognises the need to bring areas other than the principle national centre into the development process and to locate new core regions in the periphery."⁽²⁾ This strategy is consistent with the long-term regional development process. To some extent it leads to distributing investment at the same time taking some advantage of urbanisation economies.⁽³⁾ In the same line, Hansen argues that "concentrated decentralisation...is a strategy which it has been widely felt, will surely prove more effective in promoting various development goals than would either entirely dispersing growth or entirely concentrating it in very large cities."⁽⁴⁾

Nevertheless, Hozelitz emphasised that the picture we witness in many Asian countries is one which has no proper analogue in the past urban development of the West. He argues that, "Although in pre-industrial periods primate cities existed there also, the overall cultural distance of these cities from the country side surrounding them was never as great as in present-day under-developed countries. Although in their settlement patterns, and even in their small population composition, the cities of Asia are closer to the countryside than was the case of European cities, except during short periods of their history,

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- (1) Lloyd Rodwin, Nation and Cities, Boston, Houghton Mifflin Co., 1970.
(2) John Friedmann, Regional Development Policy, A Case..., op.cit., P.52.
(3) D. F. Darwent, op.cit., P.19.
(4) N. M. Hansen, "An Evaluation of Growth-Centre Theory and Practice", Environment and Planning, Vol. 7, 1975, P.822.

the cultural distance between city and countryside is greater in newly developing countries than in Europe."⁽¹⁾

Hence, primate cities in developing countries, which Hauser,⁽²⁾ attributed their origin and growth largely to their functions as an (entropot) between the colony and the imperial country, imposes heavier economic and social cost because of their large size resulted from the location of different activities and consequently population in these cities. The socio-economic costs of urban size will be the main core of chapter four.

6. Knox⁽³⁾ adds another difference between developed and developing countries during their early period of industrialisation and urbanisation, that is, the total rates of population growth. He argues that, "... the most important difference between developing countries at present and the developed countries during their period of industrialisation and urbanisation is not the rate of urbanisation of the former but in their higher total rates of population growth, 2-3 per cent a year, and in a few cases 3.5 per cent, compared with 1-1.5 per cent a year in Britain during the industrial revolution and in other developed countries during their population explosion."⁽⁴⁾ Knox adds that "...from the standpoint of agricultural efficiency it might be said that the rate of urbanisation in the developing countries is too low rather than too high. But the dilemma faced by these countries lies in the fact that even the present rate of urban growth pattern possess serious problems."⁽⁵⁾

(1) Bert Hoselitz, Sociological Aspects..., op.cit., P.225

(2) Philip Hauser, op.cit., P.36

(3) Frank Knox, op.cit., P.22

(4) Ibid, P.22.

(5) Ibid, P.22.

Finally, Knox concluded that "...even if there are (prime facie) grounds for believing that the process of urbanisation is helpful to economic development, this does not mean that the type of urbanisation at present experienced in many developing countries, involving the expansion of capital cities and the cities which are already very large (in absolute terms or in relation to the total population) is necessary or desirable."⁽¹⁾ There is little evidence to support arguments either on behalf of or against concentrating investments in the primate centres of developing countries. The choices between centralisation or decentralisation urban-growth strategy in developing countries, depends on the national goals and objectives of development whether it is in favour of efficiency or equity criteria and the stage of development reached by these countries. Hence, one can not recommend decentralisation for every developing country nor did can advocate the 'dismemberment' of primate cities. While in some countries decentralisation within the core region may be appropriate, in others a rural based decentralisation policy may prove more effective. However, there is a considerable debate still unsettled over this question and its consequences.

2.5. Summary

The definition of the concept 'Urban' is a complex matter. It is a dynamic concept that continually is being changed by new conditions. No absolute boundary line, could be drawn, between what is called urban and rural areas. The multidisciplinary approach of delineations of the urban area which depends on a set of socio-economic, demographic and administrative factors is the most realistic approach. On the contrary, the characterisation of a community as urban on the basis of one criterion,

(1) Ibid, P.22.

which many national population censuses adopt, is obviously arbitrary and does not give an accurate picture of urbanisation process of a specific country.

Different concepts of urbanisation could be distinguished, that is, the behavioural, the structural and the demographic concepts. Each concept focuses on specific elements of the process and consequently is used for different analytical purposes. What concern this study is the demographic or statistical concept which refer to the proportion of the population resident in urban areas. Rural urban migration is though to be an important element in urbanisation.

A close positive correlation is found to exist between both economic development and urbanisation process of not only different countries but also within different regions of the same country. As a result of this close correlation, the national system of cities may be treated as the spatial form of organisation adopted by the economy to achieve its goals. Growth and development of cities is a necessary condition of economic development, where the latter occurs in a specific locational matrix which is primarily urban and industrial in composition.

Urban growth is also associated with industrialisation and the relationship of these two processes is usually assumed to be so close that some writers speak of the two processes as two facets of one and the same process. The historical evidence on the urbanisation of both developed and developing countries confirms such associations. However, the same set of historical evidence confirms that the role of industrialisation on urban growth has been decreasing in recent years leaving the tertiary activities to play a more vital role.

The direction and manner of urbanisation differs from country to country and by time. Differences are more apparent if developed countries are taken against developing ones. Although there are many

similarities with respect to urbanisation in the advanced countries, at their early stages of development, and the present developing countries, there are also important differences which extend to include differences in the pattern of urban growth, socio-economic aspects, political aspects and demographic aspects of urbanisation. These differences are due to many forces. Among these forces are the differences in the world political situation, differences in the forces making for urbanisation, differences in the ratio of population to resources and level of living and differences in basic outlook and value system.

Finally, although the developing areas of the world are less urbanised than the developed ones, the rate of urbanisation of the former, in recent decades, is increasing and is higher than that of the latter. Half the urban population of the world by now are expected to be living in urban areas of the developing countries against only 25 per cent in 1920.

Hence, it could be concluded that the discussions in this chapter provided a general understanding of the problem of the urban growth. Generalisations regarding the correlation between economic development, industrial development and urbanisation process could help in explaining the causes of urban growth in Iraq and the U.E.R. in the past few decades. It will also help in visualising the size of the expected urban growth in the U.E.R. as a result of the committed economic development. The fact that remarkable differences exist between urbanisation of the developed countries during their early stages of development and that of present developing countries and the prevalence of different sets of socio-economic, political and cultural forces behind such differences implies that when planning for urbanisation in a developing region such as the one in question, the direct copying from the experiences of the developed countries should be avoided and the adoption of many of the facts developed there should be undertaken cautiously and in accordance with the socio-economic circumstances of a particular case or that of the similar cases.

CHAPTER THREE

THE QUESTION OF CITY-SIZES AND DISTRIBUTION

(One)

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(One)

INTRODUCTION

The Questions of city sizes and distribution have been discussed for a long time and in different contexts: from the theoretical point of view in models of spatial organisation, in studies of economic and demographic development as well as in comparative regional or country investigations, in the context of optimal urban development strategies for thinly populated or under-developed regions, and from the point of view of regional economic and social policies in general and in many countries.

Most urban and regional scholars regard the question of how to explain the size distribution of cities as one of the most fascinating intellectual problems in urban and regional analysis. Richardson, for instance, reviewed several reasons for this: "the topic is relevant to all societies regardless of their level of development, location or cultural background; it has attracted the attention of many social scientists - economists, geographers, sociologists and statisticians - and no one discipline has the monopoly of wisdom."⁽¹⁾ In another paper, Richardson⁽²⁾ argued that the possibility of treating the national system of cities as a spatial form of organisation adopted by the industrial economy to achieve its growth goals, adds another dimension to discussions of growth in the aggregate economy, and the spatial urban dimension is fully as worthy of study as the more familiar macro economics and sectoral approaches.

(1) H. W. Richardson, "Theory of Distribution of City Sizes: Review and prospect, Regional Studies, Vol.7, 1973, P.239.

(2) H. W. Richardson, "Optimality in City Size,..."op.cit., P.29.

Despite this world wide concern of the phenomenon, there is no widely acceptable theory and the problem remains a mystery. Tinbergen, among other scholars has argued that "No scientific explanation worthy of that name has been advanced so far."⁽¹⁾ Nevertheless, the theoretical challenges of the problem remain immense.

Since the literature on this subject is littered with inconsistencies and confusion, clarification of some of the issues arising out of the existing state of knowledge is an important pre requisite for further research. Hence, this chapter does not aim to develop a theory of city size distribution. Its main aim is to survey a wide range of theories; to assess the standard explanations; to review some very recent suggestions. It also aims in presenting some empirical evidence and documentation on city size distributions. It intends to find out what kinds of statements can be made inspite of all the difficulties encountered, what generalisations can be drawn from past experiences, and what conclusions can legitimately be drawn.

3.1. Origin and Early Theoretical Literature on City-Size Distribution

Periodically in the past century the location and distribution of cities and settlements have been studied. Important contributions have been made by individuals in many disciplines. Reviewing the original contributions on city size distribution, Ullman⁽²⁾, pointed out that the first theoretical statement of modern importance was Von Thünen's Der isolierte Staat (the Isolated State), first published in 1826, wherein he postulated an entirely uniform land surface and showed that under conditions a city would develop in the centre of this land area

(1) J. Tinbergen, "The Hierarchy Model of the Size Distribution of Centres", Papers and proceedings of the Regional Science Association, Vol. 20, 1968, P.65.

(2) A. Ullman, "The Theory of Location for Cities" in P. K. Hatt and A. J. Reiss (ed), op.cit., PP.227-236.

and concentric rings of land use would develop around the central city.⁽¹⁾ The essence of Von Thunen's theory is that net revenue per unit of a particular product is a declining function of the negative influence of transport costs on profits. The first and nearest ring will consist of both highly perishable products for which spoilage increases with time and transport distance and products very heavy or bulky in relation to their value. Outward to this ring, each successive ring will be utilised for products progressively cheaper to transport in relation to their value.

In 1841 Kohl investigated the relation between cities and the natural and cultural environment, paying particular attention to the effect of transport routes on the location of urban centres.⁽²⁾ In 1894 Cooley admirably demonstrated the channelizing influence that transportation routes, particularly rail, would have on the location and development of trade centres.⁽³⁾ In 1927 Haig sought to determine why there was such a large concentration of population and manufacturing in the largest cities.⁽⁴⁾ In the same year, Bobeck insisted with reason that studies, concerned themselves largely with the internal geography of cities, with the pattern of land use and forms within the urban limits, valuable though they were, consisted only half the field of urban geographical question what are the causes for the existence, present size, and character of a city?⁽⁵⁾ Since the publication of this article, a number of urban studies in Germany and some other countries have dealt with such questions.

(1) Ibid, P.227; and R. E. Dickinson, "The Regional Relations of the City", in P. K. Hatt and A. J. Reiss (ed), op.cit., pp.269-270.

(2) A. Ullman op.cit., P.227.

(3) Ibid, P.227.

(4) Ibid, P.227.

(5) Ibid, P.228.

3.2. Statistical Models of City-Size Distribution

It has been recognised that city-sizes vary enormously within a region or country. The most superficial observation shows that the distribution of city sizes is strongly skewed to the right, i.e. there are many small cities and a few very large cities in almost all countries and at almost all times.

Three statistical distributions of urban size have received most attention: the lognormal distribution, the Pareto distribution and the Rank-size distributions. The three distributions are respectively given by:⁽¹⁾

$$N = \log P \dots \quad (1)$$

Where N =cumulative percentage of cities; and P =city size.

$$N(P^-) = AP^{-a} \dots \quad (2)$$

Where $N(P^-)$ = cumulative percentage of cities above the threshold level, P^- ; A, a =constants.

Equation number (2) can be expressed as

$$\log N(P^-) = \log A - a \log P \dots \quad (3)$$

which is similar to equation (1). If the data yield a good fit, the city size distribution can be represented by a straight line with a slope of $-\alpha$.

The rank-size distribution is given by

$$R.P^q = K \dots \quad (4)$$

Where R =city rank; q, k =constants

re-arranging the equation we obtain

$$R = KP^{-q} \dots \quad (5)$$

Equation No. (5) is identical to the Pareto distribution except that rank of city is used instead of cumulative percentage of number of cities.

(1) See for example, H.A.Simon, "On a Class of Skew Distribution Functions", Biometrika, Vol. 42, 1955, PP.425-440; B.J.L. Berry, "Cities as Systems within Systems of Cities", papers and proceedings of the Regional Science Association, Vol. 13, 1964, PP.147-163; B.J.L.Berry and Woldenberg, "Rivers and Central places: Analogous Systems", Journal of Regional Science, Vol. 7, 1967, PP.129-139; and H. Richardson, "Theory of the Distribution of City Sizes:...", op.cit., PP.239-251.

A special case of the rank-size distribution is obtained where $q=1$. This is called the rank-size rule.⁽¹⁾

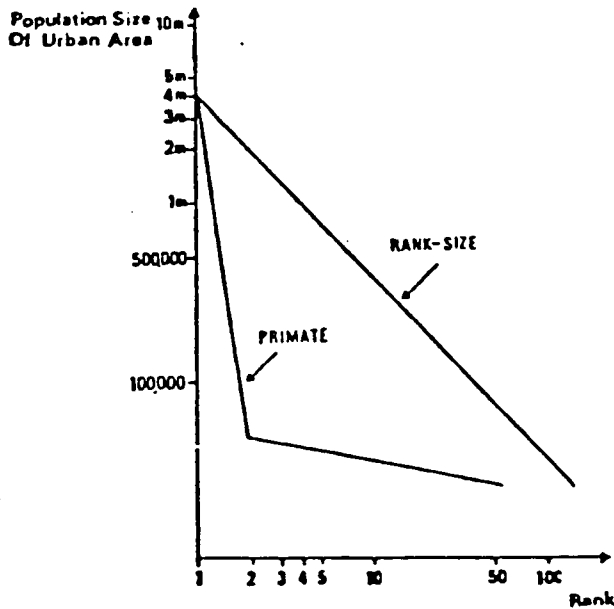
$$R.P=K=P_1 \dots \quad (6)$$

where P_1 = size of the largest city.

Richardson pointed out that "A frequent reason for the failure of this special case to hold is that $K \neq P$ (this inequality also has repercussions on the value of q), usually because P_1 is overdeveloped relative to the rest of the urban system."⁽²⁾ As it has been mentioned earlier, the tendency for the largest city to be excessively big with stunting effects on cities of nearby rank is the primate distribution case. One possible example is shown for comparative purposes in figure (3.1)

Figure (3.1)

Urban Size Distribution



Source, B. Goodall, The Economics of Urban Areas, Bergamon Press, Oxford, 1978, Figure 11.4, P.294.

(1) The rank-size rule, is associated with the work of Singer and Zipf. In its simplest form, this rule states that the population of a given city tends to be equal to the population of the largest city divided by the rank of city-size into which the given city falls (See G.Z.Zipf, Human Behaviour and the principle of Least Effort, Addison-Wesley, Cambridge, Mass.1949; and H.W.Richardson, Regional Economics... op.cit, P.182

(2) H.W.Richardson, "Theory of the Distribution of City-Size..." op.cit, P.240.

The three distributions are mathematically so similar that it is difficult to choose between them. Richardson suggests that, "If we were concentrating on the upper tail there might be a preference for the Pareto or rank-size distributions, especially if data limitations impose a minimum urban place threshold as defined by census data, or if a minimum critical size for a viable urban service centre is determined on theoretical grounds."⁽¹⁾ The Pareto may also be preferred if the upper tail is highly skewed. On the other hand, if very disaggregated data are available and if the analyst is concerned with the whole range of city sizes, the lognormal may be more appealing.⁽²⁾

Berry has shown that rank-size appears to be valid throughout many parts of the world, particularly in countries with high degree of urbanisation, in large countries and in developing countries such as India and China which are not only large but have a long history of urbanisation.⁽³⁾ Parr also viewed that the rank-size distribution has greater validity than other models.⁽⁴⁾

The statistical distribution models have been strongly criticised. Stanback and Knight, for instance, argued that these models are not very useful since the only thing they can explain is the existence of an urban hierarchy. Furthermore, they add that the models rest on insecure foundation since they assume that the rate of change in the size of any city is uncorrelated with its actual size which seems to be wrong at least in the short run, for recent work has shown the rates of growth to be correlated with city size.⁽⁵⁾

(1) Ibid, P.240.

(2) Ibid, P.240.

(3) B.J.L.Berry, "City Size Distribution and Economic Development", op.cit., P.585.

(4) J.B.Parr, "Models of City Size in an Urban System", papers and proceedings of Regional Science Association Vol.25, 1970, PP.221-253.

(5) See for instance T.M.Stanback, and R.V.Knight, The Metropolitan Economy, Columbia University Press, New York, 1970 and E.Won Böventer, "Determinants of Migration into West Germany Cities, 1956-61/1961-66", Papers and Proceedings of the Regional Science Association, Vol. 23, 1969, PP.53-62.

Furthermore, although these various statistical distributions may yield good fits with national data, they do not consider the spatial distribution of cities. Also they fail to provide an economic and social explanation for the occurrence of the empirical distributions. These drawbacks, reduce the possibility of grasping the implications for planning policy applications.

The rank-size rule received most of the criticisms. Christaller, for instance, described the rank-size rule as a most incredible law which was not much more than playing with numbers.⁽¹⁾ Richardson argued that "this criticism is directed solely against the rule itself (i.e. the special case $q=1$)"⁽²⁾ He adds despite satisfactory fits in some cases, there is no reason for restricting analysis to the $q=1$ case. The rank-size distribution may instead be interpreted as a very general model according to the value of the exponent.⁽³⁾ This interpretation gives some support to Davis finding on city size distribution. Davis in 1970 computed a measure of primacy for all the countries in the world that had at least four cities of at least 100,000 population each in 1960. The measure is the population of the largest city divided by the sum of the population of the next three largest cities. Among, the 46 countries included in Davis tabulation, the primacy statistic varied from a low of 0.51 to a high of 4.64. It is thus clear that the deviations from rank-size rule are substantial.⁽⁴⁾ Berry in turn analysing the city-size distribution in 38 countries showed that whilst 13 of the countries had rank-size distribution the

(1) W. Christaller, Central Places in Southern Germany, Translated by C.W.Baskin, Prentice-Hall, Englewood Cliffs, New Jersey, 1966, P.59.

(2) H.W.Richardson, "Theory of Distribution of City Size..."op.cit.P.240.

(3) Ibid, P.240.

(4) E.S.Mills, op.cit.P.118

remainder had either primate distribution or distributions intermediate between primacy and rank-size.⁽¹⁾

Von Boverter, criticising the rank-size rule and central place systems believes also that they "...are purely empirical relationships. Their parameters can be measured for the real world, but they cannot be derived on the bases of more fundamental data."⁽²⁾ Boverter, questioned the validity of such system and asked:⁽³⁾

(i) What kinds of macro economic interrelationships are the bases of the systems rank-size rule or city hierarchy systems - that have been found in the real world?

(ii) How stringent or stable are the 'laws' that have been formulated - to what extent can one rely on them?

(iii) Can such empirical relationships be used for regional policy decisions?

To answer these questions Boverter concluded that "For policy purposes, the rank-size rule is much too crude a measure to be of any real significance and might even lead to entirely wrong consequences. Whether there are deviations from the expected regularity or not, one should always look for specific causes of the particular developments."⁽⁴⁾

The rank-size rule seems to apply to certain societies. Discussing this specific point, Richardson, argued that "...it may apply only to societies having certain characteristics which are not universal."⁽⁵⁾

(1) B.J.L.Berry, "City Size Distribution and Economic Development", op.cit., PP.573-588.

(2) E.VonBoverter, "City Size Systems; Theoretical Issues, Empirical Regularities and Planning Guides", Urban Studies, Vol.10, 1973, P.149.

(3) Ibid, P.149.

(4) Ibid, P.150.

(5) H.W.Richardson, Regional Economics: Location theory..., op.cit., P.183.

He adds, that there is evidence that developing countries are less likely to support the rule than more advanced countries.⁽¹⁾

Accordingly, instead of having one rank-size distribution, a range of rank-size distributions are recommended. Boventer summarizing on this point argued that, "...we may state that not one rank-size distribution, but depending on the economic and political circumstances in a particular country, widely different rank-sizes distributions may be considered as optimal. Particular rank-size distribution parameters cannot give any clue that might help in the national planning decision processes."⁽²⁾

Despite, the usefulness, of such city size distributions in; first, highlighting the possible existence of regular orderly relationships between city sizes and urban growth; second, providing a framework for further empirical studies; and thirdly, providing a more systematic attempt to construct a theory of urban growth, they are too far from being an urban growth theory. However such theory is long way off. An interdisciplinary approach is not merely desirable, it may be essential to deeper understanding of urban growth,⁽³⁾ simply because it will rest on a more realistic bases.

3.3. Hierarchical Models of City-Size Distributions

Hierarchy models have received most emphasis in the literature. Whereas the earliest studies on city size distributions merely concentrated on trying to account for the shape and nature of the observed statistical functions, the central place model, pointed out Richardson, 'was the first deductive theory of the distribution of cities.'⁽⁴⁾

(1) Ibid, P.183.

(2) E. Von Boventer, 'City Size Systems;...' op.cit., P.157.

(3) H. W. Richardson, 'Location Theory, Urban Structure,...' op.cit. P.185.

(4) H. W. Richardson, 'Theory of Distribution of City Sizes....', op.cit., P.241.

In 1915 Galpin published the result of a study of central place functions in rural Walworth County, Michigan,⁽¹⁾ which Johnson described as "a trail-blazing document that led sociologists, political scientists, geographers and economists to explore more thoroughly the social, economic and political interrelationships between towns and their markets; and to appraise the spatial range of the services that were, or might be, performed for the rural population by central places."⁽²⁾

Galpin surveyed his county to determine which people relied on which central places as the locus for their marketing, banking, milk sales (it was a dairying county), church going, schooling and news purchases. He found that matching people with places for specific functions and services produced concentric zones of varying sizes, depending upon the specific services or functions in question.

As in Von Thünen's model, transport or travel distance was the determining factor in the dimensions of the zones. People tended to use the closest service centre so that if the Walworth County landscape had resembled the featureless plain of Von Thünen's 'isolated state' the service zones would describe perfect circles.

Aided in his perceptions by his empirical findings, Galpin theorized that only where such circles overlap can the resident have a rational alternative between centres. That is, competition between centres, Ceteris Paribus, would exist only in those areas defined by the overlap of two circles. Moreover, this competition would cause centres to be equidistant, assuming no areas left unserved. Galpin's much cited

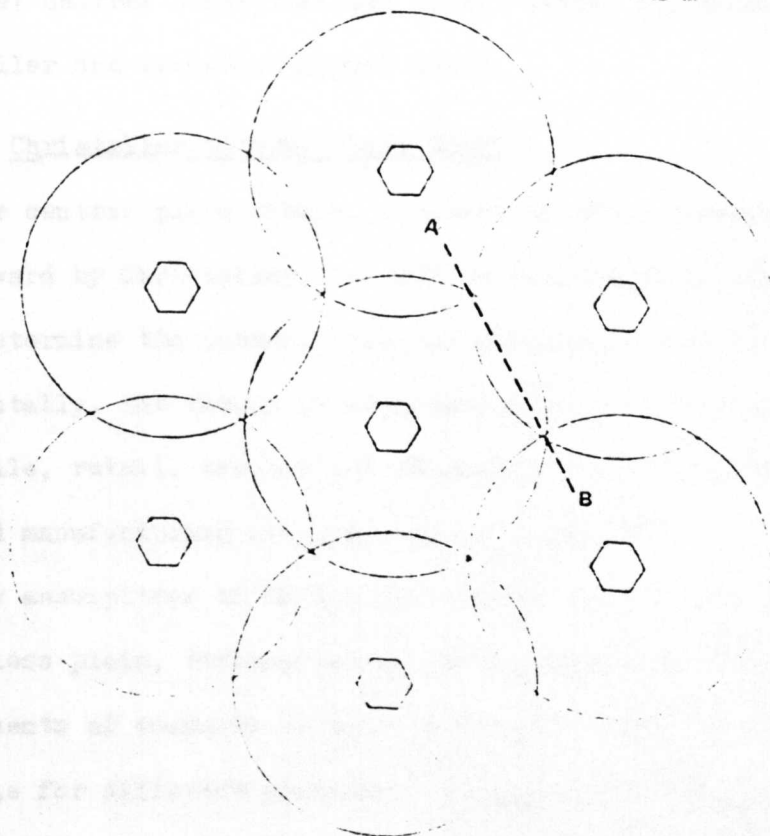
(1) The original article was published as "The Social Anatomy of an Agricultural Community", University of Wisconsin, Agricultural Experiment Station, Research Bulletin, No. 34, Wisconsin, 1915. References to Galpin's work in this section were taken from E. A. J. Johnson, The Organisation of Space in Developing Countries, Harvard University Press, Cambridge, 1970 and Brian J. L. Berry, Geography of Market Centres and Retail Distribution, Prentice-Hall, Englewood Cliffs, 1967.

(2) E. A. J. Johnson, op.cit., P.117.

diagram depicting this spatial composition of centres is shown in the following figure.

Figure (3.2)

Galpin's Model of Overlapping Market Areas



Source, Galpin, op.cit., P.17.

Galpin's model very nearly resembles the hexagonal market area so familiar in present day central place theory obtained simply bisecting each of Galpin's shaded zones, as shown by line AB in the diagram. The resulting network of hexagonal market zone would be in a state of spatial economic equilibrium. The resident of each hexagonal space is closer to the market place at its centre than to any of the surrounding market or service centres and, being totally rational, he or she patronises the closest centre.

This formulation, of course, assumes that conditions of perfect competition pertain with respect to marketable goods and services.⁽¹⁾

Two derivatives of Galpin's work, the hexagonal market/service area and the hierarchy of centres are at the heart of the next major breakthrough in central place theory - the integrated nested hierarchy of market centres conceptualized by the German geographer Walter Christaller and economist August Losch.

3.3.1. Christaller Central Place Model

The central place theory, a theory of urban hierarchy, was first put forward by Christaller, in 1933 in an attempt to explain the laws which determine the number, size and distribution of towns.⁽²⁾

Fundamentally, the theory is concerned with the patterns through which wholesale, retail, service and administrative functions plus market-oriented manufacturing are provided to consumers.

Key assumptions in Christaller theory are the existence of a featureless plain, transportation costs, economies of scale, the spatial requirements of economic activities and the variation in demand functions for different products. He assumes a hexagonal market area with the locus of production or distribution at the centre. With these parameters established, and assuming the rational behaviour of perfect competition, he, and as it will be shown later on, Losch, set about spatially organising economic activities.

According to this theory, the chief function of a town is to be the centre of a region. Such settlements which are prevalently the centre of regions, Christaller called Central Places.⁽³⁾ In contrast to these are dispersed places, that is, all those places which are not centres.

(1) Brian J. L. Berry, Geography of Market Centres...., op.cit. PP.62-63.

(2) W. Christaller, op.cit.

(3) Ibid, PP.16-17.

Some central places are more important than others - their central functions extend over regions in which other places of less importance exist. Goods produced at central places and the services offered there are called central goods and services.⁽¹⁾ On the other hand, dispersed goods are ubiquitous. In order for a particular good to be considered a central good, it must be produced at the centre of the surrounding region. The distance over which a good offered at a central place can be sold is known as the range of the good.⁽²⁾ The goods has both upper and lower limits to its range. The upper limit is the maximum radius of sales beyond which the price of the good is too high for it to be sold. The lower limit of the range encloses the number of consumers necessary to provide the minimum sales volume required for the goods to be produced and distributed profitably from the central place. This is also known as the threshold level of goods. Each good will have its own range. This is because prices of different goods increases at different rates with increasing distances from the centre. Moreover, different goods have different thresholds.

The area enclosed about a central place by the range of a good is the complementary region of the centre.⁽³⁾ Ideally, the market area surrounding a centre ought to be circular with the central place at the mid point of the circle. However the use of the circle will either leave some unserved areas or will lead to some overserved areas. Next to the circle, hexagons are the most efficient figures both to serve an area and to fill an area completely.

Using the terms defined above and a set of assumptions, Christaller evolved a hierarchy of central places on the basis of the threshold level, central goods and services. Therefore, market areas are built up around these places in such a fashion that the larger central places incorporates

(1) Ibid, PP.19-20.

(2) Ibid, PP.49-58.

(3) Ibid, P.21.

with its hinterland all places of the next order. The efficient ordering of space under such conditions, due to marketing competition, result in hexagonal market areas for places of each order. The hexagonal hinterlands of lower order places are necessarily smaller than those of higher order places because of this specialisation in the production of lower order goods.

In addition to marketing principle which defines a spatial system in which a minimum number of central places achieves a maximum distribution of goods over a given region, Christaller, in his central places presented two other fundamental principles, the transport and the socio-political principle.

The transportation principle dictates a linear system in which the hexagons defining central place market areas are aligned so that "as many important places as possible lie on one traffic route between two important towns."⁽¹⁾ This system was developed because, as Christaller rightly perceived, transport links between central places arranged according to the marketing principle are kinked and inefficient. Figures (3.3.A) and (3.3.B) illustrate the distinction between the transport and marketing principles.⁽²⁾

In figure (3.3.A) central places of each size less are spaced equidistant from one another on the perimeters of hexagonal market areas and collectively from a hierarchy of central places. Although the six equilateral triangles of hexagonal market area I are fully serviced, transport routes linking centre P₂, P₃, P₁ and subsidiary centres along the hierarchy would be forced to follow an inefficient zigzag pattern. By contrast, rotating class three centres as in figure (3.3.B) economises on transport by providing a straight transport corridor along each ray of centres .. P₁, P₃, P₂, and subsidiary points. However, all

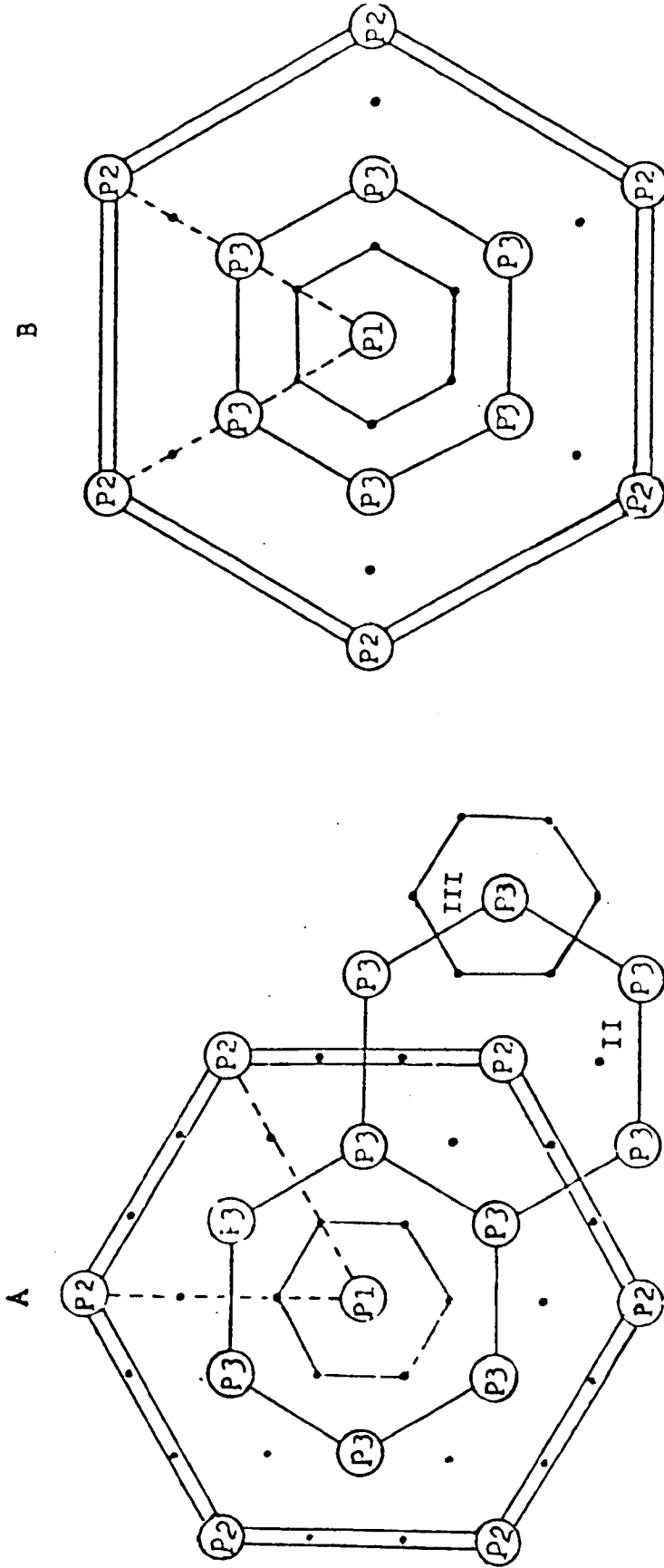
(1) Ibid, P.74.

(2) These diagrams were adapted by Johnson, from more complex illustrations by Christaller in Central places. See E. A. J. Johnson op.cit., PP.128-129.

Figure (3.3)

Central places of three size classes dispersed according to Christaller's

Market Principle (A) and Transport Principle (B)



Source: Adapted from diagrams in E. A. J. Johnson, op.cit., pp. 128-129, Figures 4.2 and 4.3.

centres are not now equidistant from one another and the total market space is not efficiently serviced. Additional centres would be required to fill the gaps.

In contrasting these two models, Christaller was attempting to demonstrate that there are two logical but mutually inconsistent models of spatial organisation. This is, centres can be organised so as to "economise on the number of central places required to supply the whole land"⁽¹⁾ or to locate "as many important places as possible...on one traffic route between two important towns, the route being established as straightly and as cheaply as possible. However the latter approach will require a considerably higher number of central places of each type...in order to supply the region with goods from a particular range."⁽²⁾

In contrast to the marketing and transport principles, Christaller's socio-political principle abandons economic rationality and efficiency in an attempt to define central places according to the dictates of administrative control, defence, and the geo-political separation of regions. The principle is a special case applying to "insecure countries and countries where the idea of community is strongly emphasised."⁽³⁾ The spatial model for such region is characterised by a large central place strategically located, ringed by smaller satellites and trailing off to low density or even uninhabited lands at the periphery. Actually, this may not be unlike some of the primate city size distributions found in developing countries today.

(1) W. Christaller, op.cit., P.71.

(2) Ibid, P.71.

(3) Ibid, P.74.

Changes over time in all of these constructs were not overlooked by Christaller, nor were they fully developed. Nonetheless he had a healthy awareness of the impact of changes in factors such as price, tastes, technology, policy etc. on distance between central places, typical sizes, and the number and location of places. Nonetheless, Christaller argued that introduction of dynamics does not change the rational scheme of the system: "only the decisive factors are changed."⁽¹⁾

The modification to the Christaller central place analysis owe a lot to Lössch, Beckmann, Tinbergen and many other scholars.⁽²⁾ Lössch, Beckmann and Tinbergen modifications will be discussed here in some details.

3.3.2. Lössch Market Areas Model

Lössch⁽³⁾, expanded the theory into a general system of hierarchies based on the same key assumptions of Christaller. He defined a system of hexagonal market places using a rationale for the hexagonal shape very similar to that derived by Galpin. In Lössch Model, each good or product requires the existence of a hexagonal market area as a necessary and sufficient condition for its production. The boundaries of these hexagonal market areas are iso profit lines for the producers and iso cost lines for the consumers. The size of the respective market area for each good depends on cost and demand, which in turn are related to the size and number of settlements served.

Lössch derived a vastly complex economic landscape in a region populated by a continuous pattern of triangularly grouped market towns.

(1) Ibid, P.111.

(2) Among them see particularly B. J. L. Berry, and W. L. Garrison, "Recent Development in Central places Theory", papers and proceedings of the Regional Science Association, Vol. IV, 1958; W. F. Stolper, "op.cit", PP.137-146; and H. C. Bos, Spatial Dispersion of Economic Activity, North Holland, 1965.

(3) A. Lössch, The Economics of Location, Translated by W. H. Woglom, and W. F. Stolper, Yale University Press, New Haven, 1971, especially Chapters 9-11, PP.105-137.

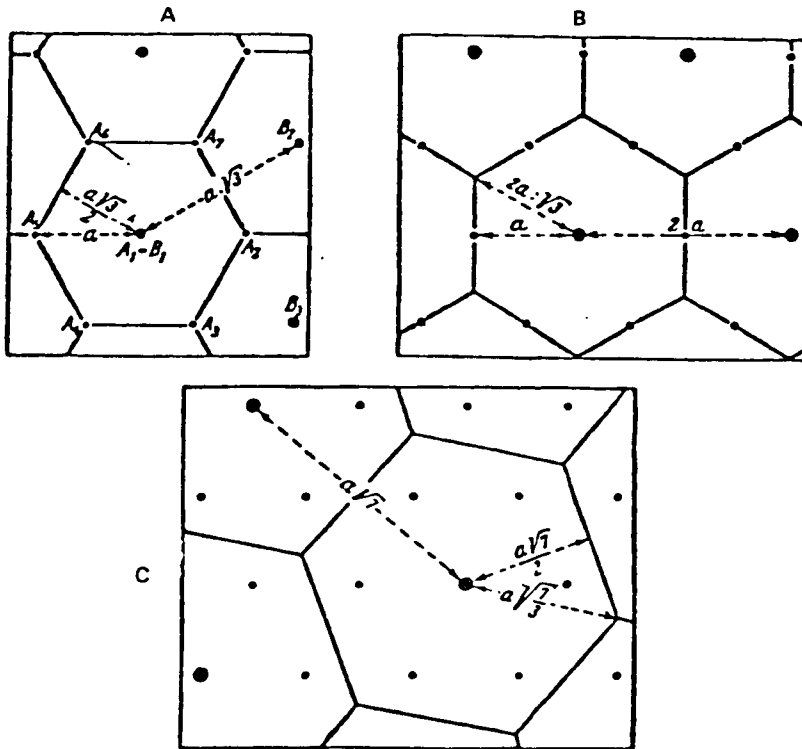
The region is overlaid by networks of market areas, each network resembling a honeycomb with cells of identical size. Each different size of market area has its own network, as illustrated in figure (3.4).

These honeycomb meshed networks of market areas - one area can be the market for several goods as there are more goods than possible market sizes - are overlaid one on the other until the definition of all networks for all goods is complete. The rules of perfect competition apply and the end result is spatial equilibrium of markets and production centres. One can begin to visualise these complex Loschain economic landscapes by imagining an extended overlay of figure ((3.4)A,B,C). Such a landscape is illustrated by figure (3.5.A).

Lösch next rotated the networks so that there is one centre common to all. This becomes the principal metropolis of the region, enjoying large local demand for the full range of products. However, further rationalisation is possible by rotating the networks around the common centre in such a way as to get six sectors with many and six with only a few production sites, see figure (3.5) A and B. With this arrangement the greatest number of locations coincide, the maximum number of purchases can be made locally, the sum of the minimum distances between industrial locations is least, and in consequence not only shipments but also transport lines are reduced to a minimum. Some of these factors also combine to create secondary urban centres of major economic importance, e.g., when axial transportation routes coincide with agglomerations of production centres and markets. It is in this way that a logical, rational urban-commercial-industrial sector emerges, integrated politically, according to Lösch, by a hierarchy of centres.

Figure (3.4)

Lösch's Market Areas, showing triangulation of centres and different sizes of market areas



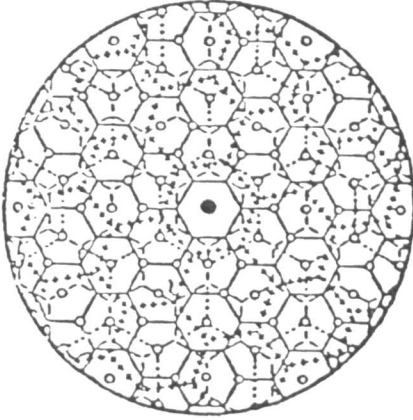
Source, Adopted from A. Lösch, op.cit., Figures 24-26, P.117.

Lösch admitted to the many probable distortions of this pattern in the real world, but did find some empirical support for this construct, e.g. in the Indianapolis and Toledo areas (See, figure (3.5) C and D) among others.

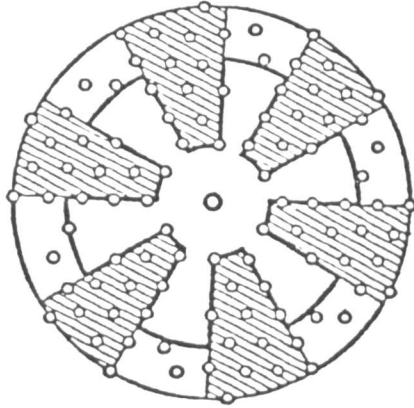
The above analysis suggest that the identification of the functional hierarchy of centres in Losch's Model was by far more complicated than the one in Christaller's Model. Parr and Denike, for instance emphasised this point and argued that "A common feature of the two models presented by Lösch and Christaller was the existence of a functional hierarchy of centres, although the hierarchy in the Löschan model was a good deal

Figure (3.5)

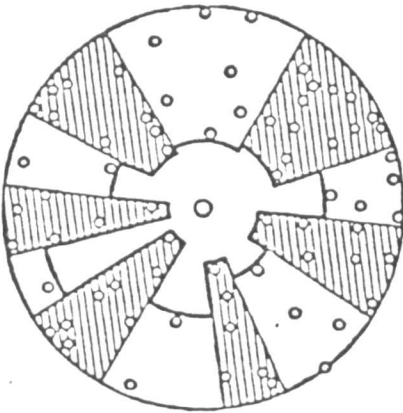
Lösch's Economic Landscapes, showing theoretical patterns (A and B) and actual landscapes for the Indianapolis and Toledo Regions (C and D)



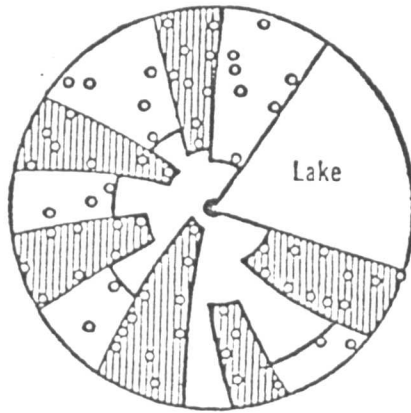
(A) Theoretical Pattern of an Economic Landscape



(B) Theoretical Pattern of an Economic Landscape, but Without Nets



(C) Indianapolis and Environs Within a Radius of 60 Miles



(D) Toledo and Environs Within a Radius of 60 Miles

Source, A. Lösch, op.cit., Figures 28-31, P.125

complicated than the Christaller one."⁽¹⁾ Moreover, Christaller's model is more oriented to services and administrative functions, whilst that of Losch concentrates on industrial functions. Losch's main objective was to "explain the complexities of market 'nets'".⁽²⁾ However, in so doing he introduced into economics the spatial element which had been all but dormant since the days of Von Thünen. The prospect his work opened up for economic was appropriately stated by Lösch himself. "For our science....the question how the economy fits into space not only opens a new field, but leads in the final analysis to a new formulation of the entire theory of economics."⁽³⁾ Unfortunately, his untimely death left this final challenge an open one.

3.3.3. Beckmann Model

Beckmann developed a key model relating central place and market area hierarchies to the distribution of city sizes.⁽⁴⁾ Beckmann's model comes from a line of thought that goes back to Christaller, Zipf and most importantly, Lösch. Mills, for instance, pointed out that "Beckmann's important contribution was to extract the crucial features from a diffuse literature and to show that they entail a simple formal model."⁽⁵⁾

Like Lösch work, Beckmann starts from a homogeneous plain over which resources are uniformly distributed and build up from the base of the hierarchy a continuous pattern of triangularly grouped market town, each with its own hexagonal market area.

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- (1) J. B. Parr and K. G. Denike, "Theoretical Problems in Central Place Analysis", Economic Geography, Vol.46, 1970, P.574.
 - (2) E. A. J. Johnson, op.cit., P.138.
 - (3) A. Lösch, op.cit., P.508.
 - (4) The source of formulation discussed in this model is M.J.Beckmann, "City Hierarchies and the Distribution of Cities Sizes", Economic Development and Cultural Change, Vol.6, 1958, PP.243-248; Location Theory, Random House, New York, 1968; and with J.McPherson, "City Size Distribution in a Central place Hierarchy: An Alternative Approach", Journal of Regional Science, Vol. 10, 1970, PP.25-33
 - (5) E. S. Mills, Urban Economics, Scott, Foresman and Company, Glenview, Illinois, 1972, PP.108-109.

Beckmann's model rests on two apparently simple, but powerful, assumptions. The first main assumption used by Beckmann to generate his hierarchy is that "a city's size is proportional to the population it serves." This assumption is given by:

$$p_m = kP_m \quad \dots \quad (1)$$

Where p_m = population of city of order m , P_m = population served by this city and k = proportionality factor.

which simply says that each urban worker produces enough to satisfy the needs of k people. A subsidiary assumption to this one is that workers in the smallest urban areas serve themselves and some rural residents. It is assumed that only a limited number, say r , of rural residents can be served by an urban area of the smallest size. Then $P_1 = r + p_1$ and equation (1) implies that

$$p_1 = k(r + p_1) \text{ or } p_1 = \frac{kr}{1-k} \quad \text{It easily follows that } P_1 = \frac{r}{1-k}$$

where, p_1 is the city size, r the rural population it serves and k the proportionality factor.

The first assumption implies simplistic production functions in which labour is the only input and the ratio of inputs to outputs is constant above a threshold level.

The second basic assumption used is that "cities of each order have a fixed number of satellite cities of the next lower order". This assumption is given by:

$$P_m = p_m + sP_{m-1} \quad \dots \quad (2)$$

Where p_m and P_m as in equation No. (1) and s is the number of satellite cities served by cities of each order.

Hence, equation (1) limits the number of people that one person can serve, while equation (2) limits the number of urban areas of the next smallest size that can be served by an urban area of a given size.⁽¹⁾

(1) Ibid, P.109

The latter equation states that the total population served by a centre of level m equals its own population plus the total population served by the centres of the next lower level that it dominates.⁽¹⁾

Beckmann next substituted (1) in (2) to get

$$P_m = kP_m + sP_{m-1} \text{ or,}$$

$$P_m = \frac{s}{1-k} P_{m-1} = \left(\frac{s}{1-k} \right)^2 P_{m-2} = \left(\frac{s}{1-k} \right)^{m-1} P_1$$

This is called a difference equation, relating P_m to P_{m-1} . It implies that P_m can be expressed as an explicit function of m .

$$\text{but, } P_1 = \frac{r}{1-k}$$

$$\text{thus } P_m = \frac{s^{m-1} r}{(1-k)^m} \quad \dots \quad (3)$$

$$\text{and, } p_m = \frac{ks^{m-1} r}{(1-k)^m} \quad \dots \quad (4)$$

Since $s > 1$ and k is between zero and 1, it follows that $s/(1-k) > 1$. Therefore, equation (4) says that city size increases geometrically with m . In other words, both the city size and the population served increase exponentially with the level of the city in the hierarchy. The basic parameters of the model are r (the size of basic rural community), k (the ratio of city size to population served), and s (the number of satellites per city). The urban multiplier, the factor by which each city size is expanded from one order to the next, is

$$\frac{s}{1-k} \quad \text{Dividing } p_m \text{ by } p_{m-1} \text{ gives}$$

$$\frac{p_m}{p_{m-1}} = \frac{s}{1-k}$$

which says that an urban area of any size is $100 \frac{s}{1-k}$ percent as big as urban areas of the next smaller size.

When m assumes its largest value, say n , then equation (3) describes a relationship between total population P , the size of the smallest community r , and the number of ranks in the city hierarchy N .

(1) Ibid, P.109; and B. J. L. Berry, Geography of Market Centres..., op.cit. P.75.

$$P = PN = \frac{s^{N-1} r}{(1-k)^N} \dots (5)$$

The final step in Beckmann's argument is to show how urban area sizes governed by equation (4) are related to the rank-size rule. In his model there is one largest urban area, s urban areas of rank 2, s^2 urban areas of rank 3, and generally s^{n-1} urban areas of rank n . Taken literally, the model implies that all urban areas of rank n are the same size. Suppose, more realistically, that there is a small random effect on urban area size, and that populations of urban areas in a given size class are distributed evenly between the population of the largest urban area in the next smaller class and that of the smallest urban area in the next larger class. Then, using the rule for the sum of a geometric series, the middle urban area in the n th class will have the rank

$$1+s+s^2+\dots+s^{n-1} + \frac{s^n}{2} = \frac{1-s^n}{1-s} + \frac{s^n}{2}$$

If n is fairly large, s^n is much larger than $1/(s-1)$, and the above expression can be approximated by

$$s^n \left(\frac{1}{s-1} + \frac{1}{2} \right)$$

derived from equation (4), is

$$PN_{-n} = \frac{kr}{s} \left(\frac{s}{1-k} \right)^{N-n}$$

Therefore, the product of rank and size is

$$\frac{kr}{s} \left(\frac{1}{2} + \frac{1}{s-1} \right) \left(\frac{s}{1-k} \right)^N (1-k)^n = c(1-k)^n \dots (6)$$

where c is a constant.

It is realistic to assume that, in reality, all cities of the same hierarchical order will not be of the same size and that the urban multiplier $\frac{s}{1-k}$ will be a random variable. After a number of rank times size

multiplications as in (6), the product itself will show a distribution pattern (in fact, that of the lognormal distribution). Carried out for all levels of the hierarchy, the effect will be a smoothing out of the rank-size graph. The distinction between size orders will be lost.

Further, since k is small relative to 1, the term

$$(1-k)^{-n} = \frac{1}{(1-k)^n} \approx 1+kn$$

is almost constant. Hence, Beckmann concluded that "rank times size \approx constant...(a statement nearly equivalent to) the so-called 'rank-size rule for cities'".⁽¹⁾

Beckmann's theory which shows that a very simple economic mechanism can generate a distribution of urban sizes that is similar to Pareto distribution, has been criticised.

Mills, for instance, levelled four criticisms against the theory. These criticisms are:⁽²⁾

First, "it assumes a simple production function in which cost curves are L-shaped, labour is the only input, and input/output ratios are constant above the minimum output". It had no demand side.⁽³⁾

Second, "the entire model is built on the foundation of the number of rural residents that can be served by cities of the smallest size. That determines the spatial distribution of urban areas of smallest size, which in turn determines the spatial distribution of urban areas of the next smaller size and so on." This argued Mills, "hardly seems an adequate foundation for a theory of urban area size in an economy in which two thirds of the population is urban."

Third, "the model ignores all geographical irregularities, natural resources availability, amenity resources, availability of labour and other discrete transportation modes and climatic differences. In short, it ignores all the natural factors that contribute to the comparative advantage of particular areas."

(1) M. J. Beckmann, "City Hierarchies and the Distribution...", op.cit., P.246.

(2) E. S. Mills, Urban Economics, op.cit., P.112.

(3) E. S. Mills, "Welfare Aspects of National Policy...", op.cit., P.120.

Fourth, "the model treats urban areas as points, without regard for spatial phenomena within urban areas. It ignores the possibility that urban area size may be partly limited by diminishing returns." Richardson also stressed this point and argued that the model ignores the intra-urban space. High commuting cost and density functions such as congestion and pollution are diseconomies of urban scale that may limit city size independent of hierarchical effects.⁽¹⁾

The second criticism made by Richardson is that, the theory ignores the fact that the relative size of cities is affected by distance between them . Deviations from the theoretical inter urban distance may not account for major changes in ranks, but they distort the regularity of the hierarchy.

The assumption that cities only export down the hierarchy is wrong, but this, argued Richardson,⁽²⁾ can be dealt with via allowing k to be variable rather than a constant. The same relaxation allows local demands to vary with city size. The number of satellite cities can also be permitted to vary between levels. These modifications, suggested by Richardson, make the model more flexible and transform it into a more general theory with a wide range of predictions compatible with more empirical examples.

3.3.4. Tinbergen Model

In 1968, Tinbergen published a paper entitled, "The Hierarchy Model of the City Size Distribution of Centres",⁽³⁾ in which he developed a model of city size distributions. The model which it could be applied to manufacturing industry since it does not depend on central places functions, is similar in some ways to Beckmann's classical model but described in terms of income.

(1) H. W. Richardson, "Theory of the Distribution....", op.cit. P.242

(2) Ibid, P.242.

(3) J. Tinbergen, op.cit., PP.65-68.

The main assumptions of the model are; First, a closed economy (i.e. without foreign trade) of regular form evenly covered with agricultural production units except in the centres; second, there are an arbitrary number of industries (H), each producing finished products, indicated by number h, where $h=0, \dots, H$. (h) is called the rank of the industry. The case where $h=0$ represents agriculture. Each industry consists of firms of optimal size (defined by scale economies). Demand for product h is satisfied by n_h firms and its total demand is $\alpha_h Y$ (where Y is the country's income and α_h is a given demand ratio for product h). It is also assumed that industries have been ordered in such a way that $n_1 \geq n_2 \geq n_3 \dots \geq n_H$ and that there is only one firm in the highest ranked industry ($n_H=1$). Third, the model assumes that all income is spent i.e. $\alpha_0 + \alpha_1 + \alpha_2 + \dots + \alpha_H = 1$. Fourth, to obtain predictions about the size distribution of cities, the model assumed that (a) there are only H orders of centre ($h' = 1, \dots, H$); (b) in any centre of rank h' , only the industries appear for which $h \leq h'$; (c) the number of firms in each industry in each centre is just sufficient to satisfy local demand for the industries of a rank lower than the centre's rank; and (d) the industry of rank h' in a centre of rank h' satisfies both local demand and the demand for that product in lower rank centres, and exports down the hierarchy are equally distributed among all h' centres.

From the above assumptions, the model derives the number of centres $n^{h'}$ of a given rank h' and the total income earned $Y^{h'}$ in all centres of that rank, and according to the following formulation:

$$Y^0 = \alpha_0 Y; \quad \dots \quad (1)$$

$$Y^0 + \frac{Y^1}{1 - \alpha_1 - \alpha_2} = \alpha_0 Y; \quad \dots \quad (2)$$

$$Y^0 + Y^1 + Y^2 = \frac{\alpha_0 Y}{1 - \alpha_1 - \alpha_2}; \quad \text{and so on} \dots (3)$$

or in general

$$Y^0 + Y^1 + \dots + Y^h = \frac{\alpha_0 Y}{1 - \alpha_1 - \alpha_2 - \dots - \alpha_h} = \frac{\alpha_0 Y}{\alpha_{h+1} + \alpha_{h+2} + \dots + \alpha_h + \alpha_0} \dots (4)$$

Hence, total income can be calculated at any stage as we ascend the hierarchy.

The model also calculated the number of centres in each rank by adding the assumption that there is always only one enterprise of the highest rank in each centre.

$$n^{h'} = n_{k'} \frac{\alpha_0}{1 - \alpha_1 - \dots - \alpha_{h'}} \dots (5)$$

Equations (4) and (5) determine the size distribution of centres. However, Tinbergen himself, pointed out that the model "...cannot be proven theoretically to be correct and it cannot be proven that it reproduces either reality or an optimum situation. It may serve as a starting point for both more refined theoretical models and empirical verification."⁽¹⁾ On the other hand, Richardson pointed out that, "This simple hierarchy model can be extended by introducing complications such as foreign trade, intermediate products, various transportation assumptions, uniquely located industries, and more complex inter urban trade flow patterns."⁽²⁾ Apparently, Tinbergen's main contribution is that he sketched out a type of central place theory which deals with manufacturing industry. Despite that, the existence of urban hierarchies in the heavily industrialised regions remains a fact in search of a theory.⁽³⁾

(1) Ibid, P.65.

(2) H. W. Richardson, "The Theory of the Distribution..."op.cit., P.242.

(3) R. Higgs, "Central Place Theory and Regional Urban Hierarchies: An Empirical Note", Journal of Regional Science, Vol.10, 1970. PP.253-255.

3.3.5. Criticisms to Central Place Models

The works of Christaller and Losch were milestones in promoting understanding of the organisation of economic activity in space and helped provide a theoretical base for the rank-size regularities and hierarchical distribution of cities observed by others. Although Christaller found support for his theoretical model in the organisation of central places in Southern Germany and Losch too was able to find empirical grounding for his theory, the central place theory, has been subject to numerous criticisms. These criticisms can be summarised as follows: ⁽¹⁾ The assumptions of perfect competition, homogeneous distribution of purchasing power and so on do not correspond to reality. Johnston pointed out that, "there is no homogeneous plain on which all decision-makers act, successfully, to gain complete economic efficiency." ⁽²⁾

The theory is often considered a static one because it does not explain development phenomenon. It neglects almost all important macro-economic interrelationships or adjustment processes. ⁽³⁾ It only aims at explaining the existence of certain pattern of centres and not explain how this pattern has come into being or what the pattern would undergo in future. Critics have also suggested that the ideal pattern of hexagonal trade areas are difficult to identify empirically.

Finally, despite these objections, there are some who believe that "...neither those nor other objections undermine the value of central place models as a rational for the size and spatial distribution of cities and towns within regions." ⁽⁴⁾ A certain degree of hierarchical organisation

(1) The following articles have provided some of the most extensive criticisms of the theory, hence for more detailed discussion of these criticisms see: R. Vining, "A description of certain Spatial Aspects of an Economic System", Economic Development and Cultural Change, Vol.3 1955, PP.147-195; B.J.L. Berry and W.L. Garrison, op.cit. PP.119-120; T. Hermansen, "Development Poles and Related Theories", in N.H. Hansen (ed), Growth Centres in Regional Economic Development, Free Press, New York, 1972, PP.178-182; J.B. Parr and K.G. Denike, op.cit. P.185; and J. Glasson, An Introduction to Regional planning, Hutchinson and Co. London, 1978, PP.160-162.

(2) R.J. Johnston, Spatial Structures: Introducing the Study of Spatial Systems in Human Geography, Mathuen and Co. Ltd., London, 1973, P.20.

(3) E. VonBoventer, "City-Size Systems;...", op.cit. P.150.

(4) H.W. Richardson, Regional and Urban Economics, Penguin Books Ltd., Middlesex, England, 1978, P.329.

and of regularity for the whole, though not for individual goods, can be expected to follow.⁽¹⁾

Hence, the following work on central-place models recognises these deficiencies, as well as the important implications of the model. They mainly dropped some of the rigid assumptions such as that of geographic homogeneity and no excess profits and brought in other elements of reality such as government intervention with public facilities and public controls over the private sector.⁽²⁾ According to Berry and Garrison, such reformulations of central place theory are "warranted" on the basis of empirical findings, that is, they relate more closely to reality and to alternative theories such as retailing and consumer behaviour.

3.4. Polarised Growth Models

Polarised growth theories which can be used as a decentralisation tool by policy makers, focused on the spatial transition of economic development and developed an integrated and dynamic model of urban hierarchy, as well as national development.

Since the first introduction of the term growth pole into economic literature in 1950 by Francis Perroux⁽³⁾ a lot has been written about growth poles and their geographic equivalent, growth centres.⁽⁴⁾ In short, Perroux, discussing the economic growth focused on inter industry linkages. His 'key' industry is the one that induces growth to both directly linked industries and to the regional economy. This key industry can be thought

(1) E. Von Boventer, "City-Size Systems;...", op.cit., P.150.

(2) B.J.L.Berry and W.L.Garrison, op.cit., and J.B.Parr and K.G.Denike, op.cit., P.580 and P.585.

(3) F. Perroux, "Economic Space:Theory and Application", Quarterly Journal of Economics, Vol. 64, 1950, PP.89-104.

(4) For a detailed discussion of the subject see for instance; D.F.Darwent, op.cit., PP.5-31; J.R.Lasuen, "On Growth Poles", Urban Studies, Vol.6, 1969, PP.137-161; Vida Nicholes, "Growth Poles; An Evaluation of their propulsive Effect", Environment and Planning, Vol.1, 1969, PP.193-208; N.M.Hansen (ed), Growth Centres in Regional Economic Development, The Free Press, New York, 1972; and N.M.Hansen, "An Evaluation of Growth - Centre Theory...", op.cit., PP.821-832,

of as one row of an input-output matrix with important linkages to many other industries and strong induced effects in the regional economy. Polarised growth in the Perrouxian context is an example of industrial dominance with no explicit attention to geographical space.⁽¹⁾ Later on the concept was adopted in a spatial framework to refer to areas and regions to which they are linked. This spatial concept of growth poles has been developed extensively in the literature on regional planning, especially in the writing of Myrdal, Hirschman, Friedmann, Boudeville and Hansen.

The growth centre policy has been increasingly adopted by governments introducing regional development programmes. The concept has overcome the barriers of ideology, since growth centre programmes have been adopted by socialist, as well as capitalist governments and by governments in both developed and less developed countries.⁽²⁾ The concept's prime virtue lies in its seemingly inherent simplicity and logic. If a government is to introduce a policy of economic dispersal then clearly every region cannot be the recipient of major new industrial activities. The growth-centre concept offers a means of taking advantage of modern technology and external economies of scale while permitting a measure of decentralisation; It permits the provision of infrastructure to poorer areas while permitting a measure of economy in its distribution. In addition, many planners have argued that the establishment of a propulsive sector in selected centres will stimulate the economies in the regions surrounding these centres.⁽³⁾

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- (1) N. M. Hansen, "Unbalance Growth and Regional Development", in D.L. Mckee, et.al.(ed), Regional Economics, The Free Press, New York, 1970, PP.229-241.
- (2) A. R. Kuklinski, (ed), Growth Poles and Growth Centres in Regional Planning, Mouton, The Hague, Netherlands, 1972; and N. M. Hansen, (ed), Growth Centres in Regional Economic Development, op.cit.
- (3) See for instance; J. R. Freidmann, Regional Development Policy, A Case....op.cit.; W. H. Nicholls, op.cit. PP.319-340; and M. J. Moseley, "The Impact of Growth Centres in Rural Regions-I", An Analysis of Spatial "Pattern" in Brittany, Regional Studies, Vol.7, 1973, PP.57-75 and "The Impact of Growth Centres in Rural Regions-II", An Analysis of Spatial "Flows" in East Anglia, Regional Studies, Vol, 7, 1973, PP.77-94.

The new economic stimula will lead to upward shifts in the local demand schedules for labour, raw materials and agricultural produce. It will generate higher prices and thereby stimulate a rise in productivity and in the employment of local factors of production. The creation of growth centres may also lead to an acceleration in the rate of diffusion of new ideas and technology. Firstly from the metropolitan centre to the growth centres themselves and, secondly, outwards into their respective regions.⁽¹⁾

In spatial terms, therefore, the growth-centre strategy is seen to contribute to economic and social development by helping to integrate the space economy.

Many scholars believe that there is a possible complementarity between the growth centres and central place theories. Todd, for instance, mentioned that '...Polarised regions and central places have much in common, especially the idea of a hierarchy of nodes capable of being demarcated by geographical boundary searching techniques.'⁽²⁾ For such a methodological linkages Hermansen defined a polarised region as "...a heterogeneous continuous area localised in geographical space, whose different parts are interdependent through mutual complementary and interplay relations around a regional centre of gravity."⁽³⁾ In the same line Bishop pointed out that, "In the recent past, there has been some interest in a possible complementarity between growth pole theory and central place theory."⁽⁴⁾ This complementarity stem from the following analysis: "Though...(central place theory) does not address growth specifically, it does suggest that growth depends on the capacity to provide services. The rate of growth is determined by the

(1) For a detailed discussion see; P.O. Pederson, "Innovation Diffusion Within and Between National Urban Systems," Geographic Analysis, Vol.2, 1970, PP.203-254; and J.R. Lasuen, "Urbanisation and Development.." op.cit., PP.163-188.

(2) D.Todd, op.cit., P.295.

(3) T. Hermansen, "Development Poles and Development Centres in National and Regional Development", in A.Kukliniski(ed),"Growth Poles...." op.cit. P.29.

(4) A.Bishop, "Polarisation Theory, Central place Theory and Spatial Development", Contact, Vol.10, 1978, P.174.

level of demand in a given hinterland; increased demand provides greater threshold attainment, thus greater range of service provision. A greater range of services attracts more households and firms."⁽¹⁾
Hence the fundamental hierarchy of catchment areas and its urban size implications complements the implicit size and hinterland attributes of the growth pole. The notion of interdependence between centre and hinterland is a hallmark of central place theory.⁽²⁾

Hence, since the spatial context of growth pole theory can develop an integrated and dynamic model of urban hierarchy, this section will elaborate on three main concepts of the theory, that is, Myrdal's cumulative causation model, Hirschman's growing points and Friedmann's core-periphery model. These three models are chosen because all of them developed essentially the same notion of polarised growth for less developed regions and/or countries in addition of focusing on the spatial context of growth pole theory.

3.4.1. Myrdal Cumulative Causation Model

Myrdal⁽³⁾, challenging classical equilibrium theory, contended that the play of market forces tended to increase rather than decrease the inequalities between regions. He has combined the factors of inter-regional dependence and process reversibility into a model which he termed a theory of "cumulative causation".

In his model, Myrdal discusses the dual tendency of growth to concentrate in one location and to spill over down. He used the terms "backwash" and "spread" effects to illustrate this process. In his analysis of the problem of geographical incidence of spread of economic development, Myrdal hypothesises that whatever the reason for the initial

(1) Ibid, P.174.

(2) Ibid, P.174.

(3) G. Myrdal, Economic Theory...., op.cit.

expansion of a growth centre, thereafter cumulatively expanding internal and external economies will fortify its growth at the expense of other areas. Without some form of direct intervention, commercial, social and cultural institutions, as well as all of those economic activities which tend to yield a large return would cluster in certain localities and regions, leaving the rest of the country more or less in a backwash. According to Myrdal "It is easy to see how expansion in one locality has backwash effect in other localities. More specifically, the movement of labour, capital goods and services do not by themselves counteract the natural tendency to regional inequality. By themselves, migration, capital movement and trade are rather a media through which the cumulative process evolves upward in the lucky region and downwards in the unlucky ones."⁽¹⁾

There is, however, a belief that "...the circular cumulative causation theory is, in fact, no more - from its upwards movement - than the Keynesian multiplier effects. From its downwards movements it does not add much in the traditional economic concept of the "vicious circle of poverty."⁽²⁾ The main difference between both the Keynesian theory and the vicious circle concept, from the one hand, and Myrdal model, from the other hand, is that the former concepts are concerned primarily with the sectoral levels of the economic system, whereas Myrdal's formulation places importance on the spatial concentration of economic activities. Additionally, it could be said that Myrdal conceptualised the regional disequilibrium and the unbalanced pattern of development in a rather dynamic framework.⁽³⁾ Todd stressed this point and pointed out that "Myrdal conceived of regional disequilibrium in terms of system approach. A process of "Cumulative Causation"

(1) Ibid, P.27.

(2) Rasool F. Al-Jabiri, op.cit., P.126.

(3) Ibid, P.127.

enhanced concentration at the centre as a result of positive feedback and the dynamic requirements of self inducing growth."⁽¹⁾

Myrdal recognised a countervailing process or "centrifugal spread effect" in which the centres of economic expansion stimulate growth in other regions, particularly the immediately surrounding areas, through the increased outlets for the hinterlands agricultural products and raw materials in addition to technical diffusion from the centre to the hinterlands.⁽²⁾ This process too can become caught up in the forces of circular causation, however, in this case, it operates in a positive or upward sense.⁽³⁾

Myrdal hypothesised that the backwash and the spread effects would balance each other in the future and if development is to be accelerated then the gradual neutralisation of the backwash effects become a necessary procedure.

Myrdal pessimism derives from his observation that spread effects are a function of the level of economic development actually attained, that is, spread effects are very weak in the poor countries and tend to be overpowered by backwash effects which continually expand the gap between rich and poor. Market forces, left to themselves, will lead to regional income inequalities such that the restoration of balance may require state policy intervention.⁽⁴⁾ Presumably, such intervention would include a more dispersed pattern of urban growth to diminish the relative importance of the privileged centre and to help create the basis in the lagging regions for increased growth and development.

To support his hypothesis, Myrdal referred to the U.N. study

(1) D. Todd, op.cit., P.296.

(2) G. Myrdal, Economic Theory....,op.cit., PP.31-32.

(3) Ibid, P.32.

(4) Ibid, P.49.

entitled "Problems of Regional Development and Industrial Location in Europe."⁽¹⁾ Two important conclusions were presented in this study. First, in Western Europe disparities of income between one region and another are much wider in the poorer countries than in the richer ones (less than 10% in G.B. and Switzerland, 10% in Norway and France, and 33% in Turkey, Spain and Italy). Second, regional inequalities have been diminishing in the richer countries of Western Europe. Accordingly, a large part of the explanation of these two broad correlations may be found in the important fact that the higher the level of economic development that a country has already attained, the stronger the spread effect will usually be."⁽²⁾

Myrdal's rather grim prognosis for the developing countries has been challenged by Williamson in a well known study of regional income inequalities, although his sample included only a handful of developing countries (six out of twenty four). In a cross sectional analysis, focusing in particular on the so-called "North-South" phenomenon of regional dualism, Williamson found that rising regional inequality is typical of the early stages of development while in the more mature stages there tends to be a convergence of regional incomes and a disappearance of disparities. His limited longitudinal studies --- data was sufficient only in two instances (U.K. and U.S.A.) ---tended to support these results.⁽³⁾

More recently, concern has been expressed over the apparent lack of spread effects observed in the developing countries. Primacy persists as a pattern and tend to be increasing. At the same time, income disparities between rich and poor continue to increase as indicated by

(1) The study is an economic survey of Europe in 1954 published by UN. in Geneva in 1955. (See, Ibid, P.136).

(2) Ibid, P.34.

(3) J. G. Williamson, op.cit., PP.99-158.

recent findings of Adelman and Moris.⁽¹⁾

Bishop also pointed out that, "The cumulative causation model is by no means a satisfactory explanation of spatial polarisation. The model acknowledges the pull of agglomeration economies, wage differentials, and cumulative advantage, but is not really fundamental in nature."⁽²⁾ He argued that "The cumulative causation notion appears to address continued polarisation rather than the underlying causal mechanisms. The notion of the trigger effect offered by Myrdal is very broad; the concept of initial advantage appears to be closely related and can possibly be articulated to include growth forces of an innovative nature."⁽³⁾

Later on, Richardson found in the spill over model he built that "...the relative strengths of polarisation and diffusion forces vary overtime, and is consistent with the general theory of spatial development stressing the dominance of polarisation in the early phases of economic development but eventually succeeded by dispersion."⁽⁴⁾

3.4.2. Hirschman Growth Points Model

Hirschman (1958)⁽⁵⁾ working independently, also contributed to the spatial dimensions of the growth pole theory, and developed simultaneously a similar theory to that of Myrdal. Like Myrdal, Hirschman discussed the dual tendency of growth to "polarise" in one location and to "trickle down" (Polarisation and trickling down terms are equivalent to the backwash and spread effects used by Myrdal). According to Hirschman, "Economic progress does not appear everywhere at the same time

(1) For the details of this point, See I. Adelman and C.T. Moris, Economic Growth and Social Equity in Developing Countries, Stanford University Press, Stanford, California, 1973, PP.158-185.

(2) A. Bishop, op.cit., P.171.

(3) Ibid, P.171.

(4) H.W. Richardson, "Growth Pole Spill overs: the Dynamics of Backwash and Spread", Regional Studies, Vol.10, 1976, P.5.

(5) A.O. Hirschman, The strategy of Economic Development, Yale University Press, New Haven, 1958.

and that once it has appeared, powerful forces make for spatial concentration of economic growth around the initial starting points.."(1) He believes that development in its first stages needs to be polarised spatially in certain growth nodes because "there can be little doubt that an economy, to lift itself to higher income levels, must and will first develop within itself one or several regional centres of economic growth.(2) External economies of agglomeration and the behaviour of the investors are the main reasons behind the tendency of economic activities to cluster in or around these "growing points". As it has been seen in previous chapter , there would seem to be a number of reasons for economic development to continue to concentrate in the growth pole itself rather than decentralising. Among these reasons, Hirschman has suggested that the investment opportunities of the centre are frequently over-estimated and that people often fail to perceive those of the periphery. The equilibrating forces of classical economies are distorted either by imperfect knowledge of the market or by a rationality aimed at something other than monetary profit.

For the purpose of analysis, Hirschman used the "North-South" model in which the development of the growth centre (the North) affected the rest of the nation (the South) through the processes of "polarisation" and "trickle-down" effects. "Polarisation effects exercised by the "North" on the "South" tend to be to the "South's" disadvantage and are due to the "North's" stronger economic position. They include severe competition for the "South's" relatively inefficient industry, and a tendency for selective migration of young, skilled, educated people from "South" to "North"...."(3) Polarisation effects, are the unfavourable impacts on the poorer regions of

(1) Ibid, P.183.

(2) Ibid, P.183.

(3) D. Darwent, op.cit., P.15.

inter-regional inter-dependence: these included the migration of the educated, the skilled, professionals and the technical workers from the poor to the rich regions and consequent adverse changes in the former's skill mix; the diversion of saving, that might have been able to be used productively in the backward region; the displacement of any embryonic industries that might exist in the poor region and the stronger relative pull of the advanced region on new locaters; and the effects of tariffs and other protectionist devices to support the core region's industries on prices, and hence on the real incomes of purchasers in the poor region.⁽¹⁾ Similarly raw materials from the periphery are drawn to the centre by the apparent greater returns on capital investment in the latter- both for public and private investment.

According to Hirschman, such a process takes place in the earlier stage of economic development, and leads, eventually, to what is called "the dual economy". Unlike most development scholars, Hirschman, when considering the question of dualism, seems very optimistic. He believes that development occurring in the "North" will set in motion forces that will induce development in the depressed "South". He regards the trickle down effect as inevitable, certis paribus. That is, "No matter how strong and exaggerated the space preference of the economic operators. Once growth takes hold in one part of the national territory it obviously sets in motion certain forces that act on the remaining parts."⁽²⁾ He adds that "in spite of this black picture (referring to dualism and unfavourable effects of polarisation), we would still feel confident that in the end the "trickling-down effect" would gain the upper hand over the "polarisation effect" if the "North" had to rely to

(1) H.W.Richardson, "Growth Poles Spillovers:....", op.cit., P.2.

(2) A. O. Hirschman, op.cit., P.187.

an important degree on "Southern" products for its own expansion."⁽¹⁾

"Trickling-down effects" according to Hirschman, are generated by purchase and investments placed in the "South" due to the "North's" expansion of activities which raise the "South's" productivity of various intermediaries, namely, raw material and agricultural products, thus raising the labour productivity and consequently generating increases in both per capita income and consumption. As Hirschman puts it, "By the increase of 'Northern' purchases and investments in the 'South', an increase that is sure to take place if the economies of the two regions are at all complementary...the "North" may absorb some of the disguised unemployed of the "South" and thereby raise the marginal productivity of labour and per capita consumption levels in the "South".⁽²⁾ The "trickling-down" effect, will lead also to the diffusion of innovations from the growth pole to the lagging areas, or using Hirschman terminology from "North" to "South".

However, despite the similarities between Myrdal's and Hirschman's frameworks, there is a profound disagreement between them when it comes to the discussion on development strategy. This disagreement could be realised from the following analysis. Hirschman places more emphasis on the need for creating "growing points" to be key factors for generating growth in the depressed hinterlands through the trickling-down effects, while Myrdal stresses the idea of neutralising the strength of the backwash effects or strengthening the spread effects in the initial stages of the development process in order to accelerate growth rates. Hermansen stressed this point and notes that, "...whereas Hirschman argues in favour of the need for initial geographical unbalance through the creation of development centres, Myrdal takes the

(1) Ibid, P.189 .
(2) Ibid, P.188.

opposite stand and argues that the mechanism for spread effect should be strengthened from the outset."⁽¹⁾ In the same line Balasa suggests that Myrdal's "spread-effects" may become more powerful at a high stage of economic development when they may take the form of increased demand for the underdeveloped regions product, rising proportion of mobile external economics, transmission of technological knowledge, and relocation of plants in response to wage differentials.⁽²⁾

However, from the analysis of both Myrdal and Hirschman, one can conclude that not all urban centres, at a point of space, grow at the same time and/or in the same rate. Both of them believe that at the first stage of development one or very few urban centres, with a strong economic potentialities can grow, there after other lagging and/or smaller urban centres can grow as a result of the benefits gained through the process of growing of the first, or very few first urban centres. Despite this tentative conclusion, there are some who believe that neither Myrdal nor Hirschman has contributed to a large extent to the spatial re-orientation of "Growth Pole Theory" because they say nothing about, how, where, and when the growing centres may be emerged and they have very little to say about the spatial manifestation of the growth impulse diffused from the centres. Richardson, for instance, pointed out clearly that "Neither Myrdal nor Hirschman were very specific in identification or quantification of these effects (backwash and spread effects). Their Models, were devoid of explicit spatial content, yet it is known that, flows, contacts and other inter-dependencies between any two units separated by space are attenuated by the frictions of distance. They made some general observations on changes in spread and backwash during the course of

(1) T. Hermansen, "Development Pole and Related Theories", op.cit., PP.185-186.

(2) Bela Balasa, The Theory of Economic Integration, Richard D. Irvin, Inc., Homewood, Illinois, 1961, P.204.

development (implicit time)".⁽¹⁾ He adds, "neither Myrdal's nor Hirschman's observations is very helpful in identifying precisely when net spread becomes positive. Moreover, the scope, content and relative strength of spread and backwash may be quite different at the intra-regional level than between regions".⁽²⁾ Hence, both of the above frameworks remain fundamentally non-spatial.

3.4.3. Friedmann's Core-Periphery Model

Friedmann, first developed the model in 1966.⁽³⁾ He focused on the spatial transition of economic development and developed an integrated and dynamic theoretical model of urban hierarchy and national development. The model has been formulated specifically to deal with the problems of urban hierarchy and national development in the developing countries basing largely upon Friedmann's work in Venezuela.

Richardson pointed out that Friedmann core-periphery model "...is a broader version of the cumulative causation approach, rounding out the narrow emphasis on economic variables and providing an alternative to the neoclassical view of inter-regional competition as a struggle among equals."⁽⁴⁾

In the early stage of his analysis, Friedmann suggested that "...the centre periphery relationships may be described as essentially a 'colonial one'. The emergence of a polarised structure will normally be accompanied by a series of displacements, from the periphery to the centre of the principal factors of production; labour, capital, entrepreneurship, foreign exchange and raw materials in unprocessed form."⁽⁵⁾ Judging

(1) H.W.Richardson, "Growth Pole Spillovers:..."op.cit.,P.2.

(2) Ibid, P.2.

(3) The model was first published in Friedmann's, Regional Development Policy: A Case....,op.cit.,It has been presented later, with slight modification, in N.M.Hansen (ed),Growth Centres in Regional..."op.cit., as "A General Theory of polarised development", PP.82-107; and as chapter three in a comprehensive volume by Friedmann himself, Urbanisation, planning and National Development,op.cit.

(4) H.W.Richardson, Regional and Urban Economics, op.cit.,P.150.

(5) J. Friedmann, Regional Development Policy: A Case....,op.cit.,PP.12-13.

from this behaviour, Friedmann concluded that "Though without substantial evidence, that the marginal productivities at the centre are vastly superior to those obtained from investments on the periphery"⁽¹⁾.

According to Friedmann's model, the periphery characterize by the dominance of agricultural and raw material production processes. Hence, "...as the periphery remains a producer of primary, chiefly agricultural materials, the secular trend in the inter-regional terms of trade will, on the whole, continue to be favourable to the centre."⁽²⁾ The concentration of industry in the core will give rise to a dualistic spatial structure and growing regional inequalities.

The growing regional inequalities, argues Friedmann, "...will give rise to political pressures intended to reserve the traditional flow of resources to the centre and to help raise per capita incomes on the periphery to a level of approximate equality with the rest of the nation."⁽³⁾ This action in favour of the periphery can have serious economic repercussions, where, "An unprincipled redistribution of resources in favour of the periphery would significantly retard progress at the centre, and, consequently, for the country as a whole."⁽⁴⁾

The continuous differentiations in economic and the resulting social opportunity between the core and the periphery can be referred to certain factors. Friedmann places particular emphasis upon the role played by innovation and invention in the transformation process.⁽⁵⁾ As a result of the comparative advantages of the core, whether they are economical, social, technological ...etc., innovations are more likely to take place in growing commercial-industrial cities within the core region.⁽⁶⁾

(1) Ibid, P.13.

(2) Ibid, P.13.

(3) Ibid, P.13.

(4) Ibid, P.13.

(5) J. Friedmann, Urbanisation, Planning and National Development, op.cit., PP.44-48.

(6) Ibid, PP.47-48.

According to Friedmann's analysis, a number of areas with common prospects and problems of development emerge from the interaction of backwash and spread effects. He identifies five interrelated regions:-

(a) the "Core region", which he defines "as metropolitan area with a high propensity for economic growth and for filtering this growth to other parts of the space economy."⁽¹⁾ Structurally, the core region, will consist of one or more clustered cities, together with an encompassing area that may be conveniently delimited by the extent of daily commuting or, alternatively, by the distribution of agricultural activities that furnish sustenance to central urban population;⁽²⁾

(b) "Upward transitional areas", are those "whose natural endowments and location relative to core region suggest the possibility of greatly intensified use of resources."⁽³⁾ Typical features of such areas are increasing investment, net immigration and increasing capitalisation of agriculture;

(c) "Downward transitional areas" are "areas of old, established settlement whose essential rural economy is stagnant or in decline and whose peculiar combination of resources suggest as optimal a less intensive development than in the past."⁽⁴⁾ Their distinctive features include net and selective out-migration, an ageing and unfavourable industrial structure, low agricultural productivity, considerable fragmentation of holdings and a generally low standard of living;

(d) "Resource frontier regions" are "Zones of new settlement in otherwise virgin territory;"⁽⁵⁾ and,

(1) J. Friedmann, Regional Development Policy. A case...op.cit., P.217.

(2) Ibid, P.41.

(3) Ibid, P(XVI).

(4) Ibid, P(XV).

(5) Ibid, P(XVI).

(e) "Special problem areas".

Moseley argues that "while the last two are to some extent 'optimal extras', the first three types of regions, arranged in rough concentric form, comprise the essential features of Friedmann's conception of the "space-economy", and provide a framework for the testing of hypotheses relating to the manner and extent of the impact of growth centres."⁽¹⁾

Friedmann visualises that economic activities ordered in space through "(a) a system of cities, arranged in a partial hierarchy, according to the functions performed by each city and (b) the corresponding areas of influence, or urban fields, that surround each of the urban centres in the system."⁽²⁾ This system of spatial organisation undergoes change with economic growth at any point within it. As a basis for measuring these effects, Friedmann proposed four hypothesis. Assuming total population to remain constant, a perfectly even distribution of population, resources, and income over a perfectly even plain, and constant technology. Then Friedmann based his model on four propositions, they are:-⁽³⁾

(a) The population of an urban field will be proportional to population of the central city:

(b) The spatial incidence of economic growth is a function of distance from a central city:

(c) The growth potentials of an area situated along an axis between two cities is a function of the density of interaction between them:

(d) Impulses of economic change are transmitted in order from higher to lower centres in the urban hierarchy.

(1) M.J.Moseley, "The Impact of Growth Centres in Rural Regions-I", op.cit., P.59.

(2) J. Friedmann, Regional Development Policy: A Case...op.cit., P.30.

(3) Ibid, PP.30-31.

Friedmann national space economy model passes through four stages of spatial development. This process tends to follow in an orderly progression, culminating in the full integration of the national space economy. Friedmann visualizes a typical sequence as shown in figure (3.6)

Friedmann, argues it is exaggerated to think of a stable pattern in the initial stage, since completely closed economies probably do not exist. But the volume of inter-regional relations in pre-industrial societies are generally small. One is hard pressed to identify real world countries today in which a wholly pre-industrial stage of development obtains.

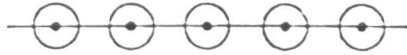
The second stage is the stage of incipient industrialisation. The spatial pattern suggested by this stage is that of primacy, the domination of the space economy by a single urban region. This stage argues Friedmann "...must be regarded as inherently unstable. It is the result of a disruption, usually externally induced, of the spatial equilibrium maintained by a pre-industrial order."⁽¹⁾ As with most single centre economies, the growth potential is limited and the draining of the hinterlands may set up social and political pressures on the periphery which eventually lead to a third, more decentralised phase. Such primacy is a common characteristic of the developing countries today although the pressure to decentralise power and growth in these countries is also on the rise and "regional equity 'balance' is regarded as a desirable goal by many planners and politicians."⁽²⁾ The problem of primacy, argues Friedmann, "...is not, as is frequently assumed, the absolute size of the central urban region - it may indeed, grow to any size whatever - but of the distribution of sizes over the

(1) Ibid, P.35.

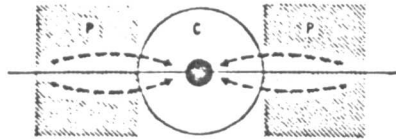
(2) World Bank. The task Ahead for the Cities of the Developing Countries, International Bank for Reconstruction and Development (IBRD), Staff Working Paper No. 209, Washington, D.C. 1975, P.37.

Figure (3.6)

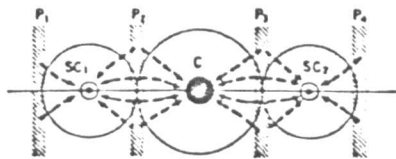
Friedmann Sequence of Stages in
Spatial Organisation



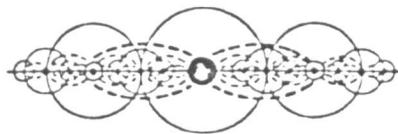
1. *Independent local centers, no hierarchy.* Typical preindustrial structure; each city lies at the center of a small regional enclave; growth possibilities are soon exhausted; the economy tends to stagnate.



2. *A single strong center.* Structure is typical for the period of incipient industrialization; a periphery (P) emerges; local economies are undermined in consequence of a mass movement of would-be entrepreneurs, intellectuals, and labor to the center (C); the national economy is virtually reduced to a single metropolitan region, with only limited growth possibilities; continued stagnation of the periphery may lead to social and political unrest.



3. *A single national center, strong peripheral subcenters.* The first stage toward a solution during the period of industrial maturation; strategic subcenters (SC_n) are developed, thereby reducing the periphery on a national scale to smaller, more manageable intermetropolitan peripheries (P_n); hypertrophy of national center is avoided while important resources from the periphery are brought into the productive cycle of the national economy; growth potential for the nation is enhanced, but problems of poverty and cultural backwardness persist in intermetropolitan peripheries.



4. *A functionally interdependent system of cities.* Organized complexity is the final solution to be aimed for during the period of industrial maturation, but it will subsequently give place to other configurations; major goals of spatial organization are fulfilled: national integration, efficiency in location, maximum growth potential, minimum essential interregional balances.

Source, J. Friedmann, *Regional Development Policy, A case...*, op.cit., Fig.(2.1), P.36.

whole spectrum of cities. Inter-regional balance and an hierarchical system of cities are essential conditions for national development."⁽¹⁾

In the third stage, the industrial maturation stage characterised by the fact that the primate city is no longer totally dominant and an integrated hierarchy of centres, sub-centres, and peripheral centres begins to emerge. This is clearly the stage the more advanced of the developing countries are in today e.g., Brazil, Venezuela, Nigeria, etc.

The four, and the last stage, is a stage of functionally inter-dependent system of cities, where peripheral areas are all absorbed into the economic spheres of metropolitan centres. The major goals of spatial organisation are fulfilled as indicated in figure (3.6.4).

Figure (3.7) shows the diagrammatic representation of Friedmann's model of spatial integration: the evolution of a system of cities. Each stage is plotted on a log-log rank-size diagram.

The core-periphery model makes an explicit attempt to explain spatial polarisation. The model goes far beyond economic factors, it takes account of social, political, geographical factors and addresses the spatial ramifications of growth.⁽²⁾ Bishop adds, the model makes an early attempt to focus on innovation in a general context, and suggests a process of innovation diffusion through an urban system. In focusing on a centre and a hinterland, the core-periphery model seems to blend with a central place concept. Indeed, the Christallerian hierarchy is the ultimate spatial form in Friedmann's formulation. The core-periphery model is also related to the growth pole notion in that it recognises the role of regional centres and agglomerations in the transmission of growth.⁽³⁾

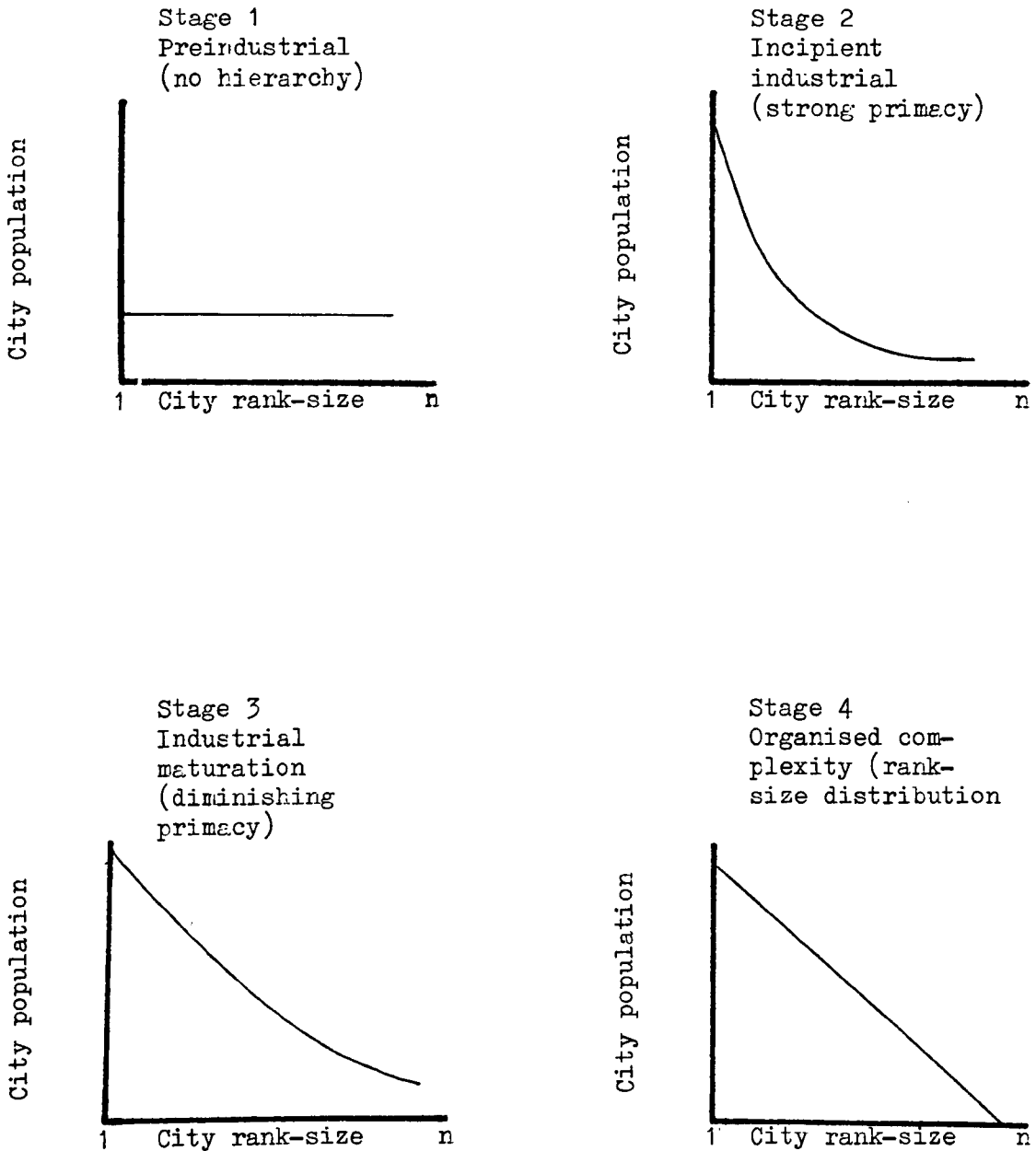
(1) J. Friedmann, Regional Development policy: A case..., op.cit., PP. 35-37.

(2) A. Bishop, op.cit., P.172.

(3) Ibid, P.172.

Figure (3.7)

Diagrammatic representation of Friedmann's model of spatial integration: the evolution of a system of cities



The importance of the model also stems from being a dynamic model; as each stage in reality is transitional. Friedmann regards even the last stage as subject to transition to still unknown pattern, when he stated that "whether further patterns lie beyond this stage (he means, functionally inter-dependent system of cities stage) must, in the absence of historical experience, remain an open question."⁽¹⁾

It is also believed that the model is highly generalised and could be utilised in the study of spatial polarisation. Bishop stressed this point and argued that "The model is obviously highly generalised, and appears to be useful as a general frame of reference, or even as a research paradigm in the study of spatial polarisation. It does identify key elements in the question of polarisation in agglomeration economies, innovation, growth centres, and the urban hierarchy."⁽²⁾

Finally, the model which gives us a dynamic framework within which to consider the evolution of urban hierarchies in developing countries is supported theoretically by Hirschman's earlier thesis and empirically by Williamson's study of regional income of disparities. Further, many developing countries seem to be at the stage of "incipient industrialisation" in which primacy prevails and a few countries are progressing beyond it. However, some doubt is cast upon the capacity of many developing countries to transit through the progressive stages of the model by the pessimistic perspective of Myrdal's "backwash" and circular causation theses, propositions which in turn are supported by the Adelman and Morris findings that internal income disparities tend to increase with development in developing countries.⁽³⁾

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- (1) J. Friedmann, Regional Development Policy: A Case...op.cit., P.37.
(2) A. Bishop, op.cit., P.172.
(3) See for instance H.W. Richardson, Regional and Urban Economics, op.cit., PP.153-154.

Despite the importance of the model in explaining spatial polarisation in developing countries, the model is criticised. Among the criticisms directed to Friedmann's model is that, he fails to explain why some centres develop while others do not, except to suggest that some became administrative centres and that eventually, industrial investment is concentrated within these areas.

Nevertheless, the model is probably the most useful theoretical suggestions that have yet been made in the field of urban and regional development. Although some elements of the theory may not be of the general nature that one might really hope for, it is apparent that general theories applicable to all regions in all parts of the world will remain elusive for a long time to come.

3.5. The Importance of Hierarchical Distributions of City-Sizes

It has been mentioned, earlier in this chapter, that the national system of cities as the spatial form of organisation is fully as worthy as the more familiar macro-economic and sectoral approaches. The tendency for the hierarchical structure of system of cities within a space, whether it is a nation or a region, to change as economic development take place is an indication of this importance. Richardson, among other scholars, concluded that 'A hierarchy of cities is an efficient system for promoting national growth and for producing and distributing goods and services to society. This suggests that it would be foolish to attempt to equalise the size of cities, but it does not help us to decide whether one hierarchical structure is superior to another.'⁽¹⁾ The national urban hierarchy also, argued Richardson, "...performs a number of important functions in the national economy which make it an efficient medium for the distribution of the total population even if some individual cities in the size distribution are

(1) H. R. Richardson, "Optimality in City-Size...", op.cit.P.45.

outside the efficient size range from the point of view of the cities when considered alone."⁽¹⁾

The national and regional hierarchy of cities fulfil many other purposes that give justification to the view that it is an instrument for achieving national growth. These other purposes can be summarized as follows:-

First: There is a general tendency that the higher the order of an urban place in the hierarchy, the greater the opportunity of invention and adaptation of new ideas and technology - Thompson⁽²⁾ has advanced the hypothesis, unrefuted by the data he has marshalled to test it, that inventions tend to generate in large cities, with large and diversified labour pools, mixed and open cultures which favour the communication of new information, fluid financing facilities, heavy endowments of infrastructural capital and potent educational and research institutions. Thompson's hypothesis is inconsistent with Pred's finding later in 1966.⁽³⁾ In the same line, Ogburn and Duncan note that between 1900 and 1935, some what over half of American innovations took place in cities with populations of 300,000 and more in 1930. A random sample of patent holders as well revealed that they were largely to be found in the major urban centres.⁽⁴⁾ They concluded that a small city or town cannot expect to witness one more often than ones in a generation, while in the larger places,...innovations may come along every two or three years on the average.

In order to utilize the innovation efficiently it should effect positively other parts of the country or region. The spread of new ideas to other parts dependent mainly not only upon the characteristics of the

(1) Ibid, P.37.

(2) W.R.Thompson, op.cit.

(3) A. Pred, The Spatial Dynamics.....,op.cit.

(4) W.F.Ogburn and O.D.Duncan, "City Size of a Sociological Variable" in E.W.Burgess and D.J.Bogue (ed.),Contributions to Urban Sociology, University of Chicago Press, Chicago, 1964, P.142.

central place in which the innovation generated but also on two other factors, the size of the received cities, towns and/or hinterlands, and the distance separating them. In general, "Innovations spread faster from central to middle-sized towns, than from these to smaller ones; the adoption lags between the successive types of towns increase in length as the town size decreases."⁽¹⁾ Hagerstrand suggests that the urban hierarchy channels the course of diffusion. He stated that, "in all adoption spreads, there is a hierarchy of centres, each dominating lower echelon centres, which is very stable over time."⁽²⁾ Furthermore, he indicates that this is due to the fact that adoptions follow diffusion, once information repetition has overcome certain resistance thresholds, and diffusion patterns originate at the centres because the earliest informed and the earliest emissaries are at the centres.⁽³⁾ Berry building mainly on Hagerstrand, has put forward another model, also of gravity type, whose main distinguishing feature is that entrepreneurial innovations are diffused and adopted down the urban system until they reach a certain minimum level.⁽⁴⁾ Pred, in his hierarchical model also observes that information often moves "...at greater speeds and/or with greater frequency between the highest order places in a given urban sub-system...than between each one of those places and most, if not all, subservient lower order centres in their respective hinterlands."⁽⁵⁾

(1) J. R. Lausen, "Urbanisation and Development,..." op.cit., P.181.

(2) Ibid, P.183.

(3) Ibid, P.183.

(4) Ibid, P.183.

(5) A. Pred, "Urban Systems Development and the Long-Distance Flow of Information through pre-electronic U.S. Newspapers", Economic Geography, Vol. 7, 1970, PP.165-181.

On the other hand, the distance separating between the central centre, the generator of innovation, and the receiving centres effect the spread of the new innovation and ideas, through distance decay factor and the acquaintance relationship that decreases as distance increases. The result is that proximity to the site of innovations, in this case, the central place, has a direct effect upon the rate of which such ideas are likely to spread into the hinterland. This is in agreement with Hagerstrand's conclusion that the spread of ideas passes from large cities to towns of the next rank, subject to the constraints of distance.⁽¹⁾

To sum up, the urban hierarchy is an efficient vehicle for transmitting innovation (new technology, managerial expertise and general economic functions) from the centre of the economy to the periphery. This argues Richardson, "...permits social and economic change to 'leapfrog' over distance and avoid the slower gradual diffusion over space from the central city."⁽²⁾ He adds, "This transmission function is aided by the fact that many modern forms of business organisation (in commerce, finance and industry) are themselves hierarchical with head offices and centres of decision making in the metropolitan centres and this decision trees spread out spatially down the urban hierarchy."⁽³⁾

Second; a hierarchy of cities permits specialisation, division of labour and differentiation in economic function. This can be interpreted as follows: Places of different sizes suited to the production of a certain array of goods and services. For, the market size requirements,

- (1) T. Hagerstrand, "Aspects of the Spatial Structure of Social Communication and the Diffusion of Information", Papers and Proceedings of Regional Science Association", Vol.16, 1965,P.42.
(2) H.W.Richardson, "Optimality in City Size...."op.cit.,P.38.
(3) Ibid, P.38.

infrastructure needs and agglomeration economies differ between firms in the same industry and between industries. Hence, a hierarchy of cities offers firms a wider choice in location and enables them to operate more efficiently.⁽¹⁾ The community, by concentrating upon commodities that are appropriate for places of a given order, can reap various agglomeration economies as output of these commodities increases. These may be in the form of urbanisation economies of scale, each leading to increased levels of output at less than proportional increase in the cost of inputs. This in turn reduces the real cost of consumption, both in the central place and throughout its market area in effect raising standards of living.

Third: the leading city in a region plays an important role in the development of that region (the growth centre strategy). Richardson emphasised this point and argued that "the hierarchical structure of cities dominant within their own regions enables each city to function in a manner appropriate to the size and character of its hinterland region."⁽²⁾ As a result, the remote primate city seems to be an inappropriate means of providing the economic and social servicing required by the typical agriculturally-based area in comparison to more localised places adopted to such productive forces. Accordingly, the leading cities of regions will vary in size and level of economic development, since regions, themselves vary in area.⁽³⁾

The last point necessary to be discussed in this section, is the effects of spacing of cities on the national and regional growth. For a distinction must be drawn between the size and the spatial distributions of cities in the national economy.

(1) E. Von Boverter, "Optimal Spatial Structure and Regional Development", Kyklos, Vol. 23, 1970, PP.903-924.

(2) H.W.Richardson, "Optimality in City Sizes..."op.cit.PP.38-39.

(3) Ibid, P.39.

Richardson stressed this point and pointed out that, "The urban size hierarchy and the urban spatial hierarchy are not necessarily symmetrical."⁽¹⁾ He gave an example that "the size hierarchy may appear very efficient in terms of distribution of population among existing centres but it could be grossly sub-optimal because of irregular spacing."⁽²⁾

Von Boverter, also stressed the importance of spacing of cities in the regional development process. He mentioned that "In any case the location of cities relative to other cities is an important aspect of regional policy."⁽³⁾ He gave the same importance to the size and distance separating the urban areas when he pointed out that, "...city sizes and distances to other cities have to be considered simultaneously, with the one aspect - the size of the city in question - focusing on intra-city agglomeration economies, and the other aspect - distances from other cities of particular sizes - bringing the importance of common agglomeration economies into the picture."⁽⁴⁾ In his economic analysis of inter-relationships in space between urban centres, Boverter, has argued that two main factors influences the ideal location for a city or a town: agglomeration economies gained by locating near a larger centre and hinterland effects which are small (or negative) near large cities because of their compativite power but are strong at a distance because of the protection of a sheltered market area. The optimal distance for a city is that which maximises the sum of agglomerations and hinterland effects. According to Boverter,

(1) Ibid, P.39.

(2) Ibid, P.39.

(3) E. Von Boverter, "City-Size Systems:...", op.cit., P.161. In the same meaning see also, "Determinants of Migration...." op.cit.; and "Optimal Spatial Structure...." op.cit.

(4) Ibid, the same as in (3) above.

the ideal distance may be difficult to pinpoint, but there is some intermediate distance at which the city will be worse off. Thus, an urban centre has better growth prospects if it is either close by a vigorous bigger city or far away from all competitors.

It should be noted however, that there is possible conflict between Boventer's findings and the earlier empirical study of the spatial aspects of urban growth in the United States by Madden.⁽¹⁾ Madden found, that the growth rates of urban centres declined with the distance from the metropolis up to 45 miles, grew steadily in the 45-64 miles range,⁽²⁾ declined up again up to 114 miles and were high but unstable beyond 115 miles. The implication of this is that there could, in fact, be an optimum distance where hinterland effects are strong but the competitive pull of the larger centre very weak.

Richardson believes that, "From the point of view of maximising growth in the economy as a whole, it is undesirable that large cities should be close together since, a large city can create its own agglomeration economies which can support smaller centres and (via a growth centre strategy) regional expansion at a distance. Small urban centres, on the other hand, have few positive hinterlands effects and a location far away from a metropolis offers no benefit."⁽³⁾ The advantages of the argument of locating smaller cities not far away from a metropolis is strengthened if there are diseconomies of scale in urban size, since the small city near the large metropolis reaps the benefits of agglomerations without the pains of large cities.⁽⁴⁾

To sum up, the existence of hierarchical system of urban areas is a prerequisite for enhancing development. Alternative forms of hierarchy can achieve similar results which are mainly generative influences

(1) C.H.Madden, "Some Spatial Aspects of Urban Growth in the U.S", Economic Development and Cultural Change, Vol.6, 1958-1959, PP.371-387.

(2) Madden found also, that urban centres in this range tended to be larger than those nearer or further from the metropolis.

(3) H.W.Richardson, "Optimality in City Size..." op.cit., P.40.

(4) Ibid, P.40.

needed to foster regional development. In a mature hierarchy of urban system this generative influences are imported from higher order cities to smaller urban areas within their hinterlands. At the same time, it is apparent that both the medium and small size cities have a distinct role to play in the growth process, especially in countries dominated by primate city. Policies should be formulated which will encourage development and consequently migration to these places from the rural areas.

CHAPTER FOUR

THE QUESTION OF CITY-SIZES AND DISTRIBUTION

(Two)

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(Two)

INTRODUCTION

To this point, only hierarchical models of city size distribution have been dealt with in detail. The discussion has avoided any but the most superficial questions of the costs associated with city size, growth and/or distribution of city sizes. Hence, in this chapter, the more recent theories and models will be presented, especially those concerned with optimality in city size and/or optimal distribution of city sizes, if there is any such optimality.

To derive firm conclusions and consequently to determine the policy implications of these findings, a theoretical, as well as empirical investigation on the subject will be carried out. Optimality and/or efficient range of sizes and distributions will be looked at from different points of view, economic, individual preferences and public policy interest. To achieve the above objective several papers dealing with this problem will be presented and discussed. In choosing these papers, their coverage of the above different points of view are taken into full consideration.

However, before dealing with the question of optimality, models dealing with the question of city sizes and distribution, not discussed in previous chapters, will be briefly presented here. These models are mainly stochastic, economic and quasi economic models.

4.1. Stochastic Models and Quasi Economic Models of City Size Distribution

As it has been seen, hierarchical models have received considerable attention and the original central-place model of Christaller has been modified to overcome some of its drawbacks and unrealistic assumptions. Other groups of models have dealt with the problem of city-size distribution. Among these models are the Stochastic models and the economic and quasi-economic models.⁽¹⁾

4.1.1. Stochastic Models:

Stochastic models emphasising the multiplicity of forces influencing city size, have substantial appeal. They "...treat urban growth determinants as proportional to the city size...or the city size distribution as the probabilistically derived steady-state equilibrium."⁽²⁾ Among the Stochastic models are: the law of proportionate effect, a market opportunities model and entropy maximization model.

In his law of proportionate effect,⁽³⁾ Simon (1955) implying that city growth is proportional to city size shows how a Pareto distribution can be generated as a steady-state outcome of an Stochastic process. Simon suggested demographic forces as a possible explanation of why the law of proportionate effect might apply. Richardson believes "The main drawback of the model is its total reliance on random and neglect of systematic factors. For example, the existence of diseconomies of

(1) The main source of the formulations presented in this section is H.W.Richardson, "Theory of the Distribution,..."op.cit., PP.243-250. Hence notation and quotations are from this article unless otherwise footnoted.

(2) Ibid, P.243.

(3) The law is originally appeared in H.A.Simon, op.cit., PP.425-440; and also discussed in some detail by E.S.Mills, Urban Economics, op.cit., PP.112-155.

urban scale....could be a systematic influence that distorts its predictions."⁽¹⁾

Ward (1963)⁽²⁾ in his model, the market opportunities model, developed an economic extension of Simon's model by arguing, that migration, and hence city growth, depends on market-expansion opportunities and that the probability of these opportunities being created is proportionate to city size. The model ignores the differential effects of technical change, demand-and product-mix effect and so on. It is made endogenous by treating city population as a measure of market size so that the market expansion opportunities can be assumed to depend on city size. To justify a Paretian distribution, Ward hypothesises that below a certain size of city the probability of opportunities developing is very low, partly because small towns are neglected in the search process of entrepreneurs and migrants and partly because of economic efficiency thresholds for opportunity creation (e.g. supply of public services, labour market thresholds....etc.).

The model argues Richardson, has limitations as "its emphasis on market opportunities could make it a culture-bound explanation applicable to market-oriented societies but much less plausible as an explanation of the similar empirical distributions of city sizes found in socialist and centrally planned economies."⁽³⁾

The entropy maximisation model, which is again a Stochastic model of city-size distribution, but built on different principles, was suggested among other geographers by Berry (1964)⁽⁴⁾ Curry(1964)⁽⁵⁾ and Olsson (1967).⁽⁶⁾ Entropy is a measure of the degree of equalisation

(1) H.W.Richardson, "Theory of the Distribution....", op.cit., P.243. In the same meaning see also, E.S.Mills, "Welfare Aspects...." op.cit., P.121.

(2) For the original and full details of the model see, B.Ward, "City Structure and Interdependence", Papers and Proceedings of Regional Science Association, Vol.10, 1963, PP.207-221.

(3) H.W.Richardson, "Theory of the Distribution....", op.cit., P.243.

(4) B.J.L.Berry, "Cities as Systems....", op.cit., PP.147-163.

(5) L.Curry, "The Random Spatial Economy; an Explanation in Settlement Theory", Annals of the Association of American Geographers, Vol.54, 1964, PP.138-146.

(6) G. Olsson, "Central place Systems, Spatial Interaction and Stochastic Process", Papers and proceedings of Regional Science Association, Vol.18, 1967, PP.13-45.

reached within a system, and is maximised when the system reaches equilibrium. This model results in the most probable distribution of a random arrangement of a given number of people in a given number of cities, with the randomness avoiding too much concentration in big cities. Hence this is similar to the rank-size rule. A city size distribution obeying the rank-size rule is the most probable distribution and presents the steady state equilibrium in which entropy have been maximised.

The attractiveness of entropy model is increased for those who believe in the value of a general systems approach. On the other hand, the chief drawback of the entropy-maximising model is the absence of a role for systematic forces.

4.1.2. Economic and Quasi-Economic Models

As it has been seen earlier, although the existence of cities might be explained by, social, cultural, or political factors, economic influences would appear to offer the better systematic explanations of the distribution of city sizes.⁽¹⁾

One of the first attempts at an economic model of city size distribution was by the mathematical biologist, Rashevsky.⁽²⁾ In effect his model is a neoclassical equilibrium theory model, where equilibrium is reached when productivity per head is equalised among cities. Rashevsky took a simple form whereby urban productivity was expressed as a function of city size and of population distribution characteristics of the system as a whole. Richardson believes that "Apart from doubts about

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- (1) H.W.Richardson, Regional and Urban Economics, op.cit., PP.333-334.
(2) N.Rashevsky, "Contribution to the Theory of Human Relations: Outline of a Mathematical Theory of the Size of Cities", Psychometrika, Vol. 8, 1943, PP.87-90; Mathematical Theory of Human Relations, Principle Press, Bloomington, 1947; and Mathematical Biology of Social Behaviour, Chicago University Press, Chicago, 1951.

the appropriateness of neoclassical migration models, the key question is whether such a model generates a distribution of city sizes consistent with those observed in the real world."⁽¹⁾ Since such a distribution is not generated directly, Richardson suggested the addition of other propositions, that is, (1) to argue that urban production functions are lognormally distributed, either via an analogy between business firms and cities or, more plausibly, because several influences behind the urban production function combine together multiplicatively; or (2) within a multisector framework to distribute industries among cities hierarchically (as in Tinbergen's model).

Zipf (1949)⁽²⁾ in addition to his famous empirical research on rank-size relationships, has contributed theoretically. In his theoretical contribution, which has been neglected, Zipf, argued that the city-size distribution resulted from the operation of three forces - the force of unification (i.e. scale and agglomeration economies), the force of innovation (reinforcing scale economies) and the force of diversification (i.e. minimisation of transport costs). The force of unification encourages concentration in one big city; the force of diversification favours a very dispersed population distribution - in the extreme, a large number of small, scattered and autarchic communities. The actual city size distribution is the net outcome between these opposing forces. Isard⁽³⁾ criticising Zipf claims that he fails to establish a link between the empirical findings. Richardson also argues that "...the level of his analysis is so general that it would require considerable amplification to show why the net operation of his

(1) H.W.Richardson, "Theory of the Distribution....", op.cit., P.245.

(2) G.K.Zipf, op.cit.

(3) W. Isard, Location and....., op.cit., P.60.

mutually offsetting forces generates a pareto distribution of city sizes."⁽¹⁾

More recently Davis and Swanson (1972)⁽²⁾ developed a model in which city sizes change as a result of the differential growth of labour forces (as a result of migration from the rural hinterland). Labour demand in each city is assumed to be a function of technical progress, and technical progress is assumed to be randomly distributed among cities. Hence, the virtue of this model is that it integrates growth theory with a Stochastic process in order to generate a lognormal city sizes distribution consistent with empirical observations.

Many other models have been suggested as providing a useful approach to city size distribution theory.⁽³⁾ The next section will deal, in some details with some of these models (the optimisation models).

4.2. Optimality in City Size and Distribution

The continuing search for an optimal size of city, or an optimal city size distribution has become a central aspect of urban growth and city-size. Economists extensively discussed the question of whether or not there is an optimal city size.⁽⁴⁾ Nevertheless, there is a small body of theoretical work on city size that might be called the optimal city-size literature. This search has permeated much of the debate on

(1) H.W.Richardson, "Theory of the Distribution..."op.cit., P.60.

(2) E. Daves, and J.G.Swanson, "On the Distribution of City Growth Rates in a Theory of Regional Economic Growth", Economic Development and Cultural Change, Vol.20, 1972, PP.495-503.

(3) H.W.Richardson, "Theory of the Distribution...."op.cit., PP.246-249.

(4) See for instance, W. Alonso, "The Economics of Urban Size", Papers and proceedings of the Regional Science Association, Vol.26, 1971, PP.67-83; G.M.Neutze, Economic Policy and the Size of Cities, Australia National University, Canberra, 1965; G.C.Cameron and O.L.Wingo, Cities, Regions and Public Policy, Oliver and Boyol, Edinburgh, 1973; H.W.Richardson, "The Economics of Urban....", op.cit.; and "Optimality in City Size....", op.cit., PP.322-327.

urban policies as well as shaped the direction of basic research. One rationale for this interest is obvious. As a policy issue, the specification of an optimum would provide a concrete objective and an explicit criterion for decisions in allocating scarce public resources.

The idea of optimal city-size is mainly to examine how costs and benefits (quantitative and qualitative costs and benefits) vary with city size, and hopefully to derive an optimal size where marginal benefits equal marginal costs (a variant of the standard efficiency criterion).

While there has been some success in defining optimal ranges of city population size for specific urban activities, notably deriving from general and partial equilibrium theory in economics and applied operations research, the goal of an optimal city size remain illusory. The classical concept of an optimal city size, which suggests an inherent optimal size for cities, implies that the best of all possible worlds would find urban population divided among cities of equal size, that size being optimal.⁽¹⁾ This classical concept of an optimal city size, argued Tisdell, "...adds to the confusion and is not very relevant to the planning of an optimal pattern of national settlement."⁽²⁾ However, much of the early work on the optimal city size problem concentrated on examining how the costs of urban government services varied with city population size, and many observers have argued that the case for traditional U shaped curve and derived the optimal city size from the bottom point of this curve. Richardson, among other scholars, argued that this is both theoretically unsatisfactory and incomplete.⁽³⁾ Even depending on the results of partial analysis of

(1) L.Wingo, "Issues in a National Urban Strategy for the United States", Urban Studies, Vol. 9, 1972, PP.3-28.

(2) C. Tisdell, "The Theory of Optimal city-sizes:Elementary Speculations about Analysis and Policy", Urban Studies, Vol.12, 1975, P.61.

(3) H.W.Richardson, "Optimality in City Size...", op.cit.P.30.

optimality, there is no agreement about a definite optimal city size or ranges of optimal city sizes. Estimates of the most efficient size range have varied widely among scholars from 30,000 to 1 million inhabitants; Svimez, for instance, suggested 30-250,000 as an efficient range,⁽¹⁾ Hirsch 50 - 100,000,⁽²⁾ Lomax 100-150,000,⁽³⁾ Clark 100-200,000,⁽⁴⁾ and Duncan 500 - 1,000,000.⁽⁵⁾

The difficulty in determining the optimal city size and/or range of city-sizes can be attributed to many problems associated with this process. Bourne,⁽⁶⁾ argues that the difficulty arises because of: First, "an optimal size for a city is a different problem from that of an optimum for a set of cities": second, "Similarly, while there may be optimal states for individual urban functions and services defined in terms of cost efficiency, such as in wholesaling or public transport, these can not easily be optimised when other functions are taken into consideration": and third, "...each optimal state will be variable depending on local conditions and geographic settings, not to mention various interest groups". In the same line, Alonso⁽⁷⁾ recognised these difficulties and pointed out that, it is difficult in practice to define an urban size since some cities merge with varying densities into one another. They can be "fuzzy" sets. Furthermore, an optimum can only be defined by using some type of preference or objective function.

(1) G.C.Cameron, "Growth Areas, Growth Centres and Regional Conversion", Scottish Journal of Political Economy, Vol.21, 1967, PP.19-38.

(2) W.Z.Hirsch, "Expenditure Implications of Metropolitan Growth and Consolidation"; Review of Economics and statistics, Vol.41, 1959, PP.232-241.

(3) K.S.Lomax, "Expenditure Per Head and Size of Population", Journal of the Royal Statistical Society, Vol.106, 1943.

(4) G.Clark, "The Economic Functions of a City in Relation to its Size", Econometrica, Vol. 13, 1945, PP.97-113.

(5) O.D.Duncan, "The Optimum Size of Cities", in J.J.Spengler and O.D.Duncan (ed.), Demographic Analysis, Free Press, New York, 1956.

(6) L.S.Bourne, Urban Systems; strategies for Regulation, Oxford University Press, 1975, London, P.25.

(7) W. Alonso, "The Economics of Urban Size", op.cit., PP.67-83.

Some approaches seek to determine the city size at which costs per capita are least and regard this as optimal. But those look only at the cost of inputs and not at output or the value of output and are, therefore, misleading. Other approaches seek to determine the city size for which income per head, production per head or "welfare or wellbeing" are at a maximum for the inhabitants of the city and regard this size as optimal. While these approaches are conceptually more satisfying than the former, they still incorporate the classical idea that a city has an optimal size which is independent of anything but the size of the city.

Accordingly, the estimates of optimal city size and/or range of size would vary from the country to country and overtime according to the methodology of the estimation whether it is for one city or set of cities: for one service or a bundle of services and so on.

Hence, for the better understanding of the concept of optimality this section will be divided into four main groups of models. Each model deals with optimisation problem from a different angle, that is, production function models, individual preferences models of optimal city size, cost of inputs and provision of services and city size, and finally the question of the optimal distribution of city sizes. In each group one or two related papers will be presented and discussed.

4.2.1. Production Function Models:

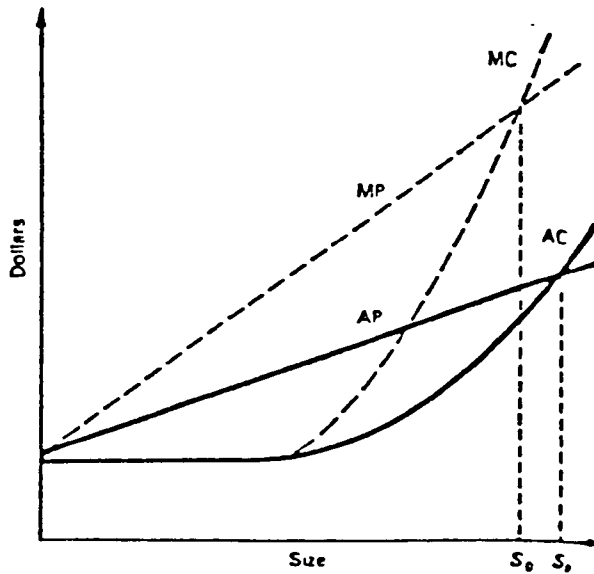
According to production function models, increasing returns to scale which are associated with spatial concentrations of production are the main economic justification for the existence and size of urban areas. A finite-sized urban area can be generated by assuming increasing returns to scale in the production of gross urban goods and decreasing return to scale in the production of transportation services or public goods, or both.

Mills⁽¹⁾ gave the first explicit formulation of the production function view of the urban area. He postulated an urban area goods production function which exhibited increasing returns to scale due to agglomeration economies. This, plus a set of behavioural assumptions, allowed him to derive a set of static equilibrium conditions for the urban area.

Alonso⁽²⁾ in 1971 outlined a simplified one - input version of the Mills model. The diagrammatical presentation of the model is illustrated in Figure (4.1) where S_p represents the private equilibrium ($AC=AP$) and S_o is the social optimum ($MC=MP$). The model can be used to consider questions of optimum size and to discuss possible urban models.

Figure (4.1)

Alonso's Diagrammatical Presentation of Mill's
Urban Size Model



Source, W.Alonso, "The Economics of Urban....."op.cit.p.71.

(1) E.S.Mills, "An Aggregative Model of Resource Allocation in a Metropolitan Area", American Economic Review, Vol.57, 1967, PP.197-210.

(2) W.Alonso, "The Economics of Urban.....",op.cit.PP.67-76.

There is an agreement that the model, as stated above, is unsatisfactory. For example, Dixit⁽¹⁾ was unable to produce optimum cities much in excess of one million people no matter how large the assumed degree of returns to scale. This argued Schaefer "could be a result of setting up the problem in terms of N identical cities or because all productive activity is located in the central business district, with the result that congestion costs increase rapidly with size."⁽²⁾ Richardson (1972) and Shaefer (1977) built two important production function models. These two models will be presented here in some detail.

Richardson⁽³⁾, numerating the drawbacks of the early procedure of work on the optimal city size problem, mentioned that; First, "The urban government service mix varies even among cities of the same size"; Second, "most empirical work has looked at how expenditures per head change with increase in population, but this throws light on scale economies only if demand is inelastic; what is really needed are measures of the influence of scale on unit costs of homogeneous output"; Third, "...the division between public and private services is arbitrary and can vary according to the institutional traditions of the economy and that some costs in the estimates may be transfer payments rather than real resource costs"; and Fourth, "A more fundamental objection is that urban government service costs are only one part, of the costs and revenues that affect optimising decision in the choice between cities."

(1) A. Dixit, "The Optimum Factory Town", Journal of Economics and Management Science, Vol. 4, 1973, PP.637-651.

(2) G.P.Schaefer, "The Urban Hierarchy and Urban Area Production Function: A. Synthesis" Urban Studies, Vol.14, 1977,PP.316-317.

(3) H.W.Richardson, "Optimality in City Size,...."op.cit.,PP.29-48.

Basing on these criticisms labeled to early models of optimal city size, Richardson, in his model, aimed to discover the relationship between private costs (i.e. producer costs and consumer costs) to city size. He attempts, theoretically to measure costs and benefits associated with city size hoping to derive an optimal size where marginal benefits equal marginal costs.

The main core of the model based on the strong evidence that a positive correlation between productivity (as measured by output per capita) and city size exist, primarily as a result of agglomeration economies. At some point, diseconomies predominate over economies leading stop rising the curve and ultimately turn downward.

Utilizing the analysis of the theory of firm, Richardson, derived the cost and product curves⁽¹⁾ of the combined public and private costs, similar to the cost and revenue curves of the above mentioned theory, with the exception that population rather than quantity of output is measured on the horizontal axis. He also questioned the idea of expecting the optimal point in each city to be located at the same population size, since it would never be expected the optimal position for each and every firm to occur at the same level of output.

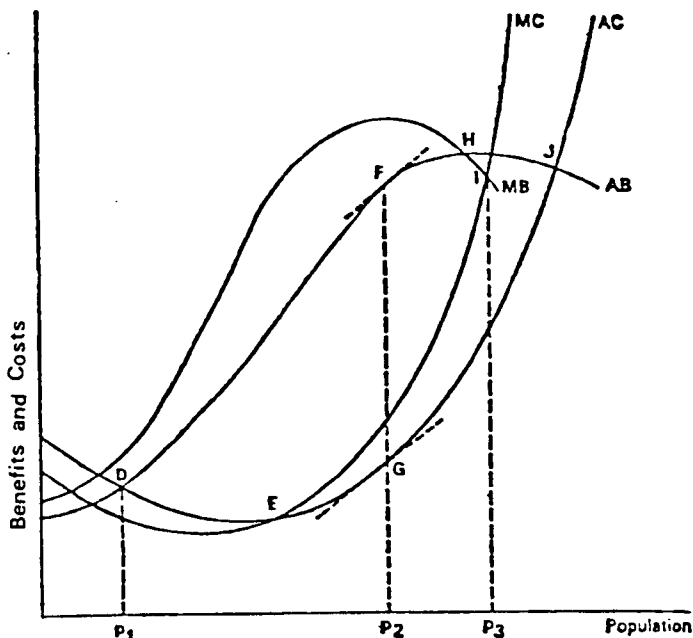
The outcome of Richardson analysis is some kind of graph relating benefits and costs to city size (see figure (4.2)). The shapes of the benefits and costs curves vary according to chosen assumptions.

The figure shows a U-shaped average cost curve with minimum costs at a relatively low population level and an S-shaped benefit curve where benefits per capita initially increase faster than city size but eventually flatten out and ultimately turn downwards.

(1) Later on Richardson named product curve as benefit curve. See H.W.Richardson, Regional and Urban Economics, op.cit., PP.322-327.

Figure (4.2)

Richardson Theory of City Size



Source, H.W.Richardson, *Regional and Urban....*, op.cit. Fig.14, P.323.

According to Richardson's model, there are several critical city sizes, not all of them optimal even in a restricted sense. D marks the minimum city size P_1 . This is defined as $AB=AC$ (average benefits equals average costs, AB rising and AC falling), which represents the threshold at which the city is viable from the point of view of providing urban services. E, the bottom point of AC, is the least-cost city size, occasionally described as an optimum, though this is clearly wrong since the benefits of city size are disregarded.⁽¹⁾

At the same time, the Richardson model presented several different optima, each reflecting a particular perspective. For the resident, the optimal size is that which maximises the gap between AP or AB and AC, that is, the city size at P_2 where the slopes of AB (at F) and AC (at G) are equal. This optimal is good for the city's residents, who would

⁽¹⁾ Ibid, P.322.

consequently like to keep out migrants, but not necessarily good for society as a whole.⁽¹⁾ At H, AB is maximised, but this is not optimal since it is as one sided as the minimum-cost city (at E). For the society as a whole two social-planning optima were presented. The first is where MB=MC; that is at point I, where the city maximises its contribution to total output provided that there is no more productive locality elsewhere for the increase in population. This social optima, argues Richardson, is true only if either there is an unlimited population or all other cities are at the equilibrium (MP=MC) point. The second social optima of the model which is more usual, and most important for urban policy, occurs at a smaller city size where MB exceeds MC by an amount equal to the opportunity cost of siting the population in alternative cities. But this optima is hardly practicable. In a free economy where migration is left largely to individual choice it is not possible to redistribute population from one centre to another in the fine marginal increments that might be needed to equate marginal product and costs in each centre.

From the point of view of a firm, again different optima is obtained, for firms are not tied to a given city but choose from the available range of city size the scale of urban area that maximises its own profit.⁽²⁾

Many criticisms have been made of the applicability of Richardson theoretical approach in defining the optimal city-sizes. Tisdell⁽³⁾ for instance, who believes, as it will be seen later in this chapter, that

(1) Ibid, P.322.

(2) Von Boventer has shown, that the optimal city for a firm is that city size which maximises the difference between agglomeration economies for that firm and the cost of urban services incurred in that city. (See E. Von Boventer, "Optimal Spatial Structure..." op.cit., PP.903-924.

(3) C. Tisdell, op.cit., P.62.

optimal size of city cannot determine in isolation. Instead, settlement patterns should be discovered which maximise overall social welfare in the economy. He argues that if urban production functions are not identical and/or are not concave throughout their length (i.e. are initially convex or linear) a market solution may result in a few cities being too big and in too many small cities. Borukhov also, on a comment on Richardson's theory, stressed this point and argued that when the number of cities in the system becomes itself a variable subject to choice, Richardson's definition of social optimal city of size when MP exceeds MC by an amount equal to the opportunity cost of siting the population in alternative cities loses its validity.⁽¹⁾ He adds, the conditions which are specified by Richardson definition are not sufficient conditions for an optimum in the latter case.

Richardson himself labelled four fundamental criticisms to his theoretical approach. These criticisms are:⁽²⁾

(a) "the existence of divergent city size optima for different interested groups blurs any meaning attached to the concept."

(b) "...many of the costs and benefits of city size are not expressed in monetary valuations and embodied in the cost and product curves". Social costs associated with increasing city size, such as pollution, noise, and congestion, are not registered in market prices. Because of these unwanted and, as yet, non-quantifiable externalities, a social optimum size may be reached at a point where the marginal product curve is still rising faster than the marginal cost curve. Yet because incoming firms and migrants have to pay only the private costs and not the social costs of locating there, market forces may stimulate continued expansion of the city well beyond this optimum.

(1) E. Borukhov, "Optimality in City Sizes and Systems of Cities: A comment", Urban Studies, Vol.12, 1975, P.325.

(2) H.W.Richardson, "Optimality in City Sizes..."op.cit,P.31.

(c) "...there is no inherent reason why the optimum should be an economic optimum". As it will be seen later in this chapter, Duncan⁽¹⁾ listed different kinds of factors that might be relevant to determine the optimum size, i.e. accessibility, health, crime and safety, educational facilities, leisure and recreational activities, social institutions, community and family ties, psychological and mental health hazard, and the desire for political participation. Hansen⁽²⁾ and Price⁽³⁾, on the other hand, mentioned individual preferences as a very important locational factor in regard to the preferred size of city which has been neglected in the formulation of the model. It assumes homogeneous tastes and preferences. It is a static model. It abstracts from shifts in production functions and it looks at the problem from one-sided perspective (that of households), whereas business firms may face a different set of cost and benefit functions. However, the weight that should be given to such factors (i.e. non-economic) depends on the policy makers objectives and on the characteristics of social preferences function that these presumably represent.

(d) "...the notion of optimum city size is not immediately consistent with the framework of the growing system of cities". The model which ignores space and treats the city as an isolated unit misjudged the fact that the city may be one element in a multi-nuclear metropolitan region, and is certainly only one unit in a complex national urban hierarchy. Within that hierarchy urban functions vary between hierarchical levels and hence efficient city sizes vary, while the functions performed by an individual city will be affected by its

(1) O.D.Duncan, "Optimum size of Cities", op.cit., PP.759-772.

(2) N.M.Hansen, "A Growth Centre strategy for the United States", Review of Regional Studies, Vol. 1, 1970, PP.161-173.

(3) C. Price, "Individual Preference and Optimal City Size", Urban Studies, Vol.15, 1978, PP.75-81.

location in space relative to other cities of equal or greater size. Accordingly, the problem of how to distribute total population efficiently over a national urban hierarchy is much more stimulating than that of determining an optimal city size under very restricted conditions. As we will see later in this chapter, Tisdell dealt with this problem in his model, "The Theory of City-Sizes...."⁽¹⁾ published in 1975. Schaefer⁽²⁾ also in 1977 built a hierarchical model of city sizes.

The main contribution of Schaefer is his attempt to introduce a hierarchy and incorporate it into the production function model of an urban area. In the urban area production functions models the city is constrained by internal supply conditions and external demand is assumed sufficient to absorb the goods produced for export. The difficulties and deficiencies of this approach led some scholars to argue forcefully for hierarchical (external) approach. Among these scholars are Richardson, in his paper already discussed and Edel⁽³⁾ who supplied some empirical support for this position. Neither author sought to integrate the two approaches.

According to Schaefer, "The three factors which generate the hierarchy and the resulting variance in community product mixes are: (i) different production costs, (ii) different transportation costs, and (iii) different demand intensities." In his analysis, Schaefer, regarded the transport costs and demand intensities equivalent for all products, and production cost is the sole determinant of the hierarchy. The crucial aspect is the volume of output at which the minimum average

(1) C. Tisdell, op.cit., PP.61-70.

(2) G. P. Schaefer, op.cit., PP.315-326.

(3) M. Edel, "Land Values and Costs of Urban Congestion", Social Science Information (Land values and City-Size), 1971, PP.12-23.

cost is achieved. The higher the volume, ceteris paribus, the larger the minimum market area. Firms which do not locate centrally so as to minimise transport costs and to maximise market access will be at a competitive disadvantage.

The above analysis is an explanation of the market areas of different economic activities and how they affect city size. If the value of output at which minimum average cost is reached is the crucial determinant of the minimum market area it will also be the main determinant of urban size. A large output requires large inputs of capital and labour and, therefore, a large city.

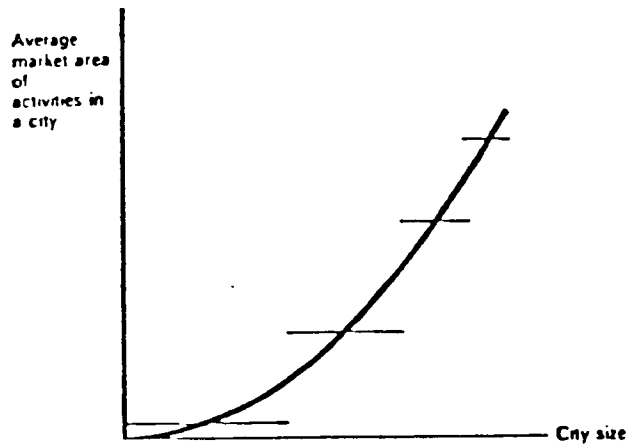
However, although the analysis regarded the transport cost and demand intensities equivalent for all products, the model give special importance to these factors. It argues that "Differences in transport costs and demand intensities will affect the size of market areas, the volume of output and city size . Higher unit transport costs and inelastic demand promote smaller market areas".

Schaefer believes that many other real factors effects market areas and consequently the urban hierarchy, such as the variations in the terrain of an area, and local variation in taste. But for the sake of avoiding more complications, the model depends only on the above variables. The hierarchy argument reached by Schaefer is given by the following figure:

The solid line in the following figure represents the continuous hierarchy. The discrete hierarchy implies that there are groups of activities with the same, or similar, market areas. The communities with only small market area activities will be in the lowest hierarchy level. Communities in the highest hierarchy level have some activities which cover the entire range of market areas and which increases the average market area of these communities. The horizontal line

Figure (4.3)

Schaefer Hierarchy of Urban Size



Source, G. P. Schaefer, op.cit., Fig. No. 2, P.318.

represent this discrete hierarchy. Thus in contrast to the previous approach, different urban sizes result from transportation costs and external demand thresholds. The model also implies that, different goods are produced in different hierarchy levels by different production functions, but the volume of output (and therefore urban size) is determined by demand outside the urban area. Thus cities producing the same goods may have different sizes.

To incorporate the resulted hierarchy into the production function estimation, Schaefer suggested three ways of doing so: The first approach, with a continuous hierarchy, implies that each urban area produces the same good, i.e. there is only one production function and different sized urban centres are just like different sized factories producing the same good; The second approach has an analogous interpretation, but the effect of the hierarchy is to create production functions for each hierarchy level which differ by a constant; and the last approach postulates different production functions for each hierarchy level where efficiency parameters and constants may vary.

An empirical study using the model was conducted by Schaefer in 1975 as a Ph.D. Thesis.⁽¹⁾ The model was estimated for the urban system in the province of Saskatchewan, Canada. A generalised production function, the "Transcendental Logarithmic Production Function" was used. A clustering procedure was used to construct a seven-level discrete hierarchy for the area's 464 communities. According to this study, in the continuous model; a hierarchy has the same effect on all communities, i.e. equal movements up the hierarchy increase output by the same percentage; labour is potentially the biggest gainer from urbanisation if factor payments have a positive relationship to productivity; and finally, it appears that the hierarchy (if it can be interpreted in a manner analogous to technical change) is capital saving or labour-using. This could reflect either a changing output mix or different prices for inputs and outputs between communities.

To sum up, Schaefer found that in the case of Saskatchewan, centres where increasing returns exist, they would appear to be located in the upper hierarchy levels. An examination of recent growth patterns confirms this. On the other hand, non-economic considerations and the disappearance of several small towns in Saskatchewan have caused successive governments to commit themselves to supporting and investing in centres which are probably non-viable.

Finally, on the theoretical level, the result supports the inclusion of the hierarchy into the urban area production model. This consists with the result of Edel and views of Richardson. Models which omit external factors are committing a potentially serious error.

(1) For a complete discussion of the empirical application of the model, see G.P.Schaefer, The Urban Area Production Function and the Urban Hierarchy, A case of Saskatchewan, Ph.D.Thesis, University of Western Ontario, 1975.

4.2.2. Individual Preferences and Optimal City Size Models

In recent years, the role of individual preferences as a factor in determining optimal city size have been emphasised by many scholars. Individual preferences models argues that the desirability of city size can only be judged in relation to the preferences of individuals for production and consumption economies and diseconomies. Hoch (1972) discussing the theoretical and empirical relationship that exists between income and city size has recognised, that he neglected an important factors in determining his optimal city size. Among these factors he mentioned the differences in preference of city size, where he believes that "some people might like, others dislike, a particular size of place even in the absence of cost of living differences and 'obvious' externalities."⁽¹⁾ Laird and Mazek (1974) and Price (1978) also have emphasised the role of individual preferences and developed two interesting models. The latter two models will be presented here in some detail.

Laird and Mazek⁽²⁾ developed a model of city sizes based mainly on individual preferences. Their aim from the locational consumer model they developed was to try to contribute to the emerging debate of dissatisfaction with the larger cities by providing models which treat locational preferences more explicitly and integrate these preferences into theory in a more systematic manner than was been done until the appearance of this paper.

The model treats the individual as integrating his dual activities as an income earner and as a consumer of location amenities. It utilizes conventional utility theory to examine the individual as he selects that combination of income and location amenities (city size)

(1) Irving Hoch, "Income and City Size", Urban Studies, Vol.9,1972,P.306.

(2) W. Laird and W. Mazek, "City-Size Preferences and Migration", Review of Regional Studies, Vol.4, 1974, PP.18-26.

which maximises his utility. The individual, in his location decision takes more into account, the locational amenities provided by the larger city than the higher income provided. Accordingly the individual reacts to: "(1) the range of choice of both private and public goods and services in localities of different sizes, (2) the different life-styles inherent in different sizes and (3) the perceived problems associated with different size localities."

The model distinguished two types of individuals: large city types and small city types. For both types the utility of income is partly dependent upon the size of the city in which the income is earned (the model assumes that cities of a given size are homogeneous).

For the large city type, the utility arising from the availability of a wider choice of private and public goods, and perhaps from the life style inherent in larger cities, outweighs any disutility arising from congestion or other urban disamenities. The indifference map for this individual reflect, a diminishing marginal rate of substitution between income and city size, with I_2 achieving a higher utility level than I_1 , see figure (4.4), with the income curve Y_1 , the large city type maximises utility by locating at a large city associated with point A, to the right of the apex of the income curve.

The small city type feels that the urban disamenities outweigh the amenities, hence, smaller cities or rural areas are preferred. Individual is "indifferent" to larger cities only when his income can be increased sufficiently to compensate for perceived disamenities. The indifference map for this individual reflect a positive and increasing marginal rate of substitution of income for city size, see curves I_1 and I_2 , figure (4.5). This positive slope of the small

Figure (4.4)

The Large City Type (I_1, I_2) and the
 Locationally-Neutral "Economic Man" (I_{ln})

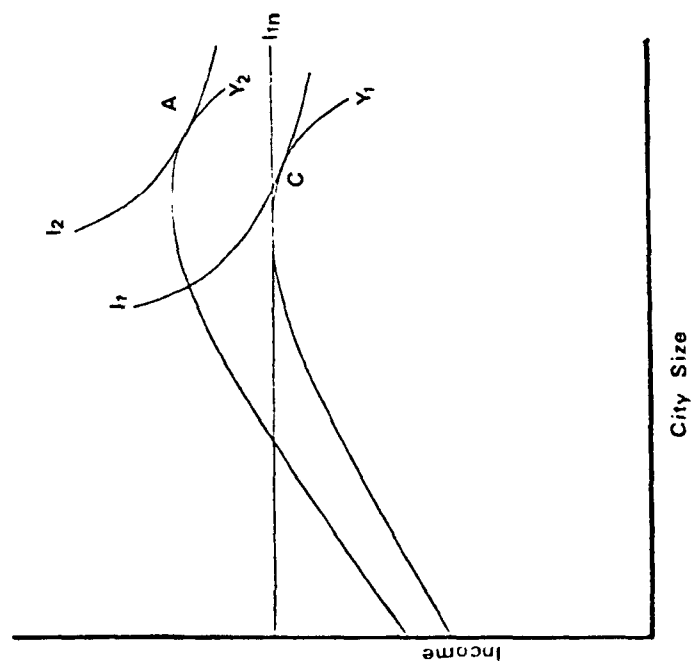


Figure (4.5)

Two Small City Types: (I_1, I_2)
 and (I_1', I_2')

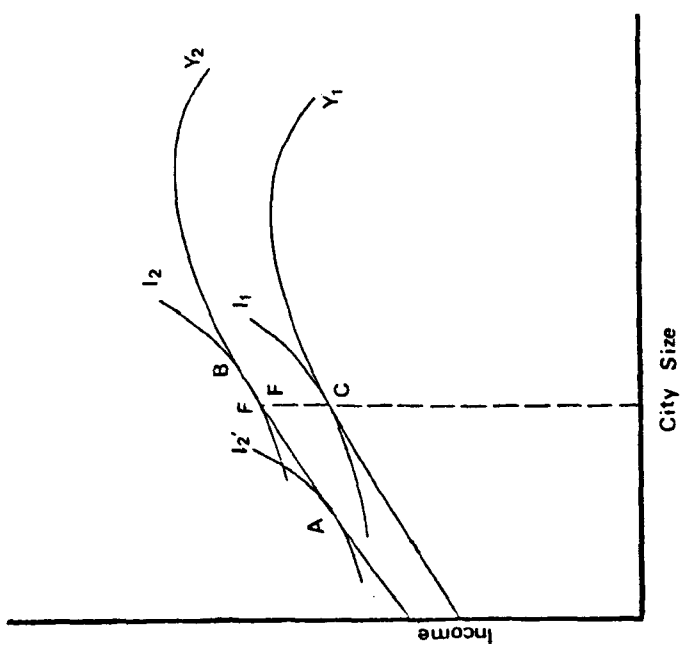
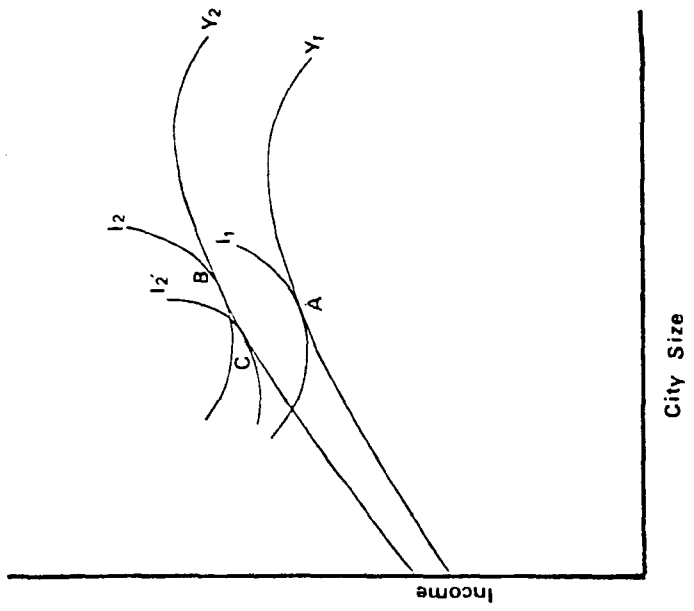


Figure (4.6)

Two Intermediate City Types:
 (I_1, I_2) and (I_1', I_2')



city type's indifference curve leads the individual to locate in a smaller city associated with point A in order to maximise his utility.

In case of rising income in all areas, the model, assuming no migration costs, expect the new optimal living-working location to behave in the following manner: The large city type will move to a larger city, maximising utility at point B. The small city type new optimal location depends on his aversion to urbanism. If the aversion is so strong that the indifference mapping is I_1 and I_2' in figure (4.5), this individual will move to a smaller city at point C. But if the aversion is weaker so that I_1 and I_2 prevail, the utility maximising move will be to the larger city at point B.

The model distinguished a third group of individuals who prefer intermediate city size. The indifference curves of this group are U-shaped, see figure (4.6). The analysis of behaviour of the individuals in this group follows the one already mentioned above.

It is worthwhile to mention here that substantial empirical basis support the type of model developed by Laird and Mazek.⁽¹⁾

The main contribution of the locational consumer model is that "The introduction of city-size preferences into the analysis of individual utility optimisation raises possibilities that have been neglected in empirical studies of migration." It made an important and necessary distinction between income and utility. The model goes beyond orthodox migration models which, by assuming that migrants maximise income only, infer a complete indifference to city size. According to the model presented here not all the migrants maximises income by migrating to the preferred city size.

(1) For the details of the evidence in support of the preference model developed by Laird and Mazek, See Ibid, PP.20-23.

The model also provides a clear conceptual measure of the intensity of preferences. The latter is measured by the marginal rate of substitution between income and city size and can be illustrated by the small city type who moves city-ward to obtain employment or to increase his income.

Contrary to the classical theories which have been discussed the question of optimal city size from the supply side, this model examined the problem from the demand side of the issue by concentrating on individual preferences. The model concludes that "If individuals do not all have the same income - location preference mapping, a unique optimum city size cannot exist from the demand side. Instead, there is a unique distribution of city sizes based upon the distribution of individual locational preferences". This optimum distribution would be characterised by those persons living in a city having similar city-size preferences.

As the founders of the model summed up, the location-consumer model serves three related purposes. "First, it provides a coherent theoretical basis for the proliferating empirical studies of city-size preferences. Second, it provides a basis for broadening the analytical framework used to study migration. Third, it provides a necessary part of the foundation upon which a more comprehensive theory of optimum population distribution can be built."

Despite many interesting aspects involved in the model. Its assumption of having two types of people is unreal and does not give an exact answer to the question of the preferred or optimal city size. The model also depending on a very few factors in its analysis, present a partial solution to the question of optimality. It ignores many

other factors (mentioned earlier in this chapter), which are expected to effect in determining the city size. Hence, the model could not be generalised.

Price⁽¹⁾ in his model "Individual Preference and Optimal City Size" emphasised the importance of individual preferences in deciding the city size. He argues that, "The desirability of city size can only be judged in relation to the preferences of individuals for production and consumption economies and diseconomies of scale." Hence, he developed a model which extends the earlier treatment of migration models, mainly based on the expected response of income-maximising wage-earners or profit-maximising firms to hypothesised relationships between costs and benefits, and mainly city size, to utility-maximising individuals.

Contrary to the classical theory of city size which relates the utility of a given city to its size, Price believed that "...no utility-level can be ascribed to a city in itself. Because the weight assigned to different elements of the product-mix offered varies from individual to individual, the city offering maximal utility depends on the individual's preferences, and there is no such thing as an optimal size."

Price's model assumes the following mechanism: "Under perfect competition and mobility in labour markets, production economies of agglomeration peculiar to a city size will attract a clustering of cities in that city size class. Competitive advantage in the class will persist until either (a) these goods which are produced with particular efficiency in that city size become so abundant and cheap as to neutralise low costs; or (b)⁽²⁾ higher wages have to be paid to

(1) Ccclin Price, op.cit., PP.75-81.

(2) Hoch, named the situation in case (b) as compensatory payments where the higher cost of living and the disutility of non-pecuniary cost is just balanced by a compensatory increment of money income. (Irving Hoch, op.cit., P.301.

compensate workers for migrating to a city size which is not preferred from the view point of consumption economies and diseconomies of agglomeration." In equilibrium, the model assumes that any remaining marginal production economies of changed city size should be reflected in higher wages and are thus internalised in individual location decisions. This assumption avoids the necessity of specifying a production function, as well as utility functions for city sizes and is embodied in the model as given by Price:

First, the distribution equation of preferred size - the individual's perceived optimum - in the population is required. For convenience, the individual's rank number is defined so that the individual with taste for the smallest settlement has rank number, $R=1$. Making preferred size, S^* , a linearly rising function of rank number can be considered neutral, in that no concentration of preference is assumed at any level of city size.

$$S_i^* = kR_i \quad \dots (1)$$

where S_i^* is the preferred size, and R_i the rank number, of the i th individual; k is a constant.

Secondly, the model relates the utilities achieved by different individuals. Again, a neutral assumption is adopted that no systematic relationship exists between an individual's rank number and utility achieved at preferred size, U_S^* .

$$\frac{dU_S^*}{dR} = 0 \quad \dots (2)$$

Price then made an adoption of Evans assumption that cost increases either side of preferred size as a linear function of proportional deviation from preferred size⁽¹⁾ - a given percentage greater or less than S^* always yielding a given percentage increase in costs. However, the

(1) Alan W. Evans, "The Pure Theory of City Size in an Industrial Economy", Urban Studies, Vol.10, 1972, P.67.

utility curve generated by this assumption may well be considered improbably apical. Price believes that, Borukhov's formulation yields a more realistic flat-topped curve.⁽¹⁾ He adds, it is probably more realistic still to make utility responsive to orders of magnitude rather than absolute size intervals.

$$U_i = f(\log S) \quad \dots(3)$$

where U_i is the utility of the i th individual; S is city size.

Price goes further and argues that a reasonable extension of this assumption is to require that multiplying preferred size by x has the same effect on utility as dividing it by x .

$$U_{S*x} = U_{S*/x} \quad \dots(4)^{(2)}$$

The following equation fulfils simultaneously the requirements of (1), (2), (3) and (4).

$$U_i = c + b \frac{\log S}{\log kR_i} - a \frac{(\log S)^2}{(\log kR_i)^2} \quad \dots(5)$$

where c , b and a are constants.

When R is fixed, i.e., for a given individual, $\log kR$ is a constant, and (5) reduces to a quadratic in the \log of S , fulfilling (3).

$$\frac{\partial U}{\partial S} = \frac{b}{\log kR_i} \cdot \frac{1}{S} - \frac{2a}{\log kR_i} \cdot \frac{1}{S} \cdot \frac{\log S}{\log kR_i} = 0 \quad \text{where } S=S^*$$

Rearranging and cancelling

$$\frac{\log S}{\log kR_i} = \frac{b}{2a} \quad \text{for all } R \quad \dots(6)$$

substituting $\frac{b}{2a}$ for $\frac{\log S}{\log kR_i}$ in (5) gives the same U_{S^*} for all R ,

i.e. (2) is fulfilled.

If S_i^* is set to equal kR_i (equation (1)), substitution in (6) gives $b=2a$. $2a$ can now be substituted in (5) for b .

(1) For the details of Borukhov's formulation see, E. Borukhov, op.cit., PP.325-328.

(2) Equation (4) can be re-interpreted as meaning that the preferred size is the geometric mean of sizes between which the migrants is indifferent. (Colin Price, op.cit., P.76).

In this modified form of (5), firstly by $(kR_i \cdot x)$, secondly $\log(kR_i/x)$ can be substituted for $\log S$, and by rearrangement the two expressions can be shown to be equal. Hence (4) is fulfilled.

From the above formulation, Price concluded that "If individuals migrate freely to the city size giving them the greatest utility, the foregoing assumptions, ..., can be shown to generate a stable, well-spaced hierarchy of city-sizes: (a) in which no one can better himself by moving; (b) corresponding reasonably well to the distributions observed empirically". The resulting hierarchy of city sizes seems at least approximately optimal, in that, whatever an individual's size preference, a city of around that size can be found. Any bunching of tastes would be matched by a corresponding clustering of city sizes. The resulting hierarchy is surprising in view of what has been written about the externalities of increasing city size. Price gives an explanation to the result. He argues that, "while decisions to migrate to a city impose net diseconomies on the residents in its lower range, this is roughly compensated by net economies realised for those in its upper taste range. Any persistent tendency for city size to alter greatly can be countered by residents moving to a more amenable size."

The optimality suggested by the model applies only with respect to those externalities whose costs (whether direct or through expense of mitigating them) vary inexorably with city size.

The model, being of a dynamic nature, illustrates the response of the hierarchy to change by giving three alternative assumptions: First, population and preferred size of city grow at the same rate; Second, size preference increases and population does not; and Third, taste is stable and population grows. The model predicts that, in the first case, the size of each city simply rises in proportion to total

population. In the second case, citizens cannot remain best satisfied with the same size of city. Those at the upper limit of the taste range will move to the next biggest city. Under the reasonable assumption that change in taste is proportional to existing taste, and given that $S^*=kR$, a greater number of people high in the hierarchy than low in it will find utility increased by moving to a larger city. In the lower part of the hierarchy the consequences are clear. Each city will attract from below a number of in-migrants smaller than the number of out-migrants to the city above. However, at the top of the hierarchy, the largest city cannot lose citizens upward, must consequently grow, and indeed will do so proportionally more than the second city is tending to shrink. In the third case, all cities become too large for residents at the bottom of the taste range they accommodate. Some out-migration from the largest to the second largest city aggravates the problem of the latter, and increases the downward stream of out-migrants from the larger cities. This movement will spread right down the hierarchy, and at the bottom of it new settlements will be created when dwellers in growing hamlets move away to find new nuclei.

This recruitment mechanism explains why previous conclusions (as those made by Tisdell) about city over growth are invalid when tastes are differentiated.

A reservation made by the model, is that "In thinly-populated developing countries, even if the taste for the intermediates is quite strong in relation to model tastes, the absolute numbers may be insufficient to populate an intermediate city."

Again, although the model dealt with an important factor in deciding the preference size of cities, that is, individual utilisation preference, which was highly neglected by classical models of city size distribution, the model relies on unreal assumptions of perfect competition and free migration.

Price himself emphasised this aspect, in his discussion of the question of inertia and optimality. He pointed out that "The model relies on an assumption of free migration; Yet this is inhibited by physical, financial and psychological inertia. The disutilities and wastages that generate inertia are real costs, however, and potential migrants do well to account for them in decisions." Gilbert⁽¹⁾ suggests that failure to optimise may arise if one group can realise economies of agglomeration imposes on others.

Another drawback of the model is that, it did not differentiate between different age groups in the analysis. Older citizens have greater investment in physical assets and also stronger psychological attachments, and are hence less likely than the young to move. It would further be expected that their tastes in city size are more stable. Moreover, the distribution of the young migrants may be to a city whose rapid growth is not desired by a second set of inert residents.

4.2.3. Cost of Inputs and Provision of Services and Optimal City-Size

There have been a number of inconclusive studies on the relationship between city size and public expenditure, and by implication public service cost functions and the efficiency of the local public sector. In general, scholars are in agreement that a close correlation exists between cost of services and the size of the urban area. Richardson, for instance, pointed out that local public services that are like, or are in fact, public utilities, (e.g. water, sewage, disposal and public transportation) do show economies of scale up to populations of medium size.⁽²⁾ On the other hand, Thompson believes that "...the cost functions

(1) A. Gilbert, "The Arguments for very large cities reconsidered", op.cit., PP.27-34.

(2) H.W.Richardson, Regional Economics;..., op.cit., P.195.

of the more critical public services (e.g. education and public safety) are much more elusive - Besides, it is more the effectiveness (quality) than the efficiency (cost) of local 'government' that is at issue."⁽¹⁾

In support with above generalisation, Hoch also believes that "The cost of government per capita may increase with city size, in the sense of an increasing price per unit of service and not of increases in quantity."⁽²⁾ He argued that in the real world, the latter could reflect the different preferences or higher real incomes of big city residents. Thompson⁽³⁾ suggests that urban public management is the scarce factor behind rising costs with scale, rather than some naturally scarce factors, such as fresh air or clean water.

Evan in 1972, developed an interesting theory of optimal city size depending on the behaviour of both inputs and services costs with city size.⁽⁴⁾ In order to visualise such correlation, Evan's theory will be presented here in some details.

Evan's city size distribution theory has been built upon the economic theory of clubs. The idea is that business firms and/or individuals are faced with alternative sizes of city. Each city can be treated as a coalition of firms and/or individuals offering a certain mix of costs and benefits. Each firm or individual tries to join the coalition membership of which maximises its own profits (or net benefit). Applying the theory of clubs, the paper shows under certain assumptions a stable hierarchy of city sizes result from this process.

Although most of the assumptions made by Evans are unrealistic, and disregard all aspects of the economy, Evans believes by doing so make it

(1) W.R.Thompson, "The National System of Cities as an Object of Public Policy", Urban Studies, Vol.10, 1972, P.101.

(2) Irving Hoch, op.cit. P.307.

(3) W.R.Thompson, "Internal and External Factors in the Development of Urban Economics", in H.S. Perloff and L.Wingo (ed), Issues in Urban Economics, John Hopkins Press, Baltimore, 1968, P.60.

(4) Alan W. Evans, op.cit., PP.49-77.

easier to carry out the analysis and to be understandable. The assumptions include the variation of market opportunities and input costs with city size.⁽¹⁾ What is assumed to be absent from the system is the possibility that firms in a small town can, use the business services of a nearby city which is larger. This hinterland effects, argued Evan, "...may be important in practice but is obviously difficult to allow for in a general theory of city size since the spatial system of cities will vary from country to country and region to region."

From his analysis, Evans made the following generalisations:-

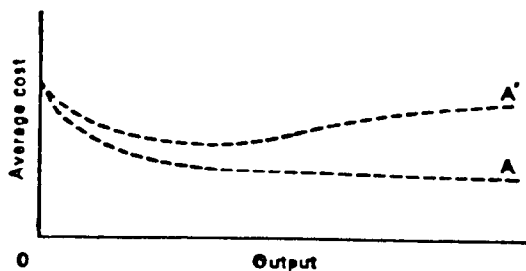
First, the rent, the price of floor space and the wages will tend to increase with city size but at a diminishing rate.

Second, the theory assumes that, if the above generalisation is right and if the cost of capital does not vary with city size, Evans argues that there must be some compensatory reduction in costs with city size which allows the firms located in larger cities to remain profitable. Basing on the notion of urbanisation economies as a result of the greater division of labour possible in the large city, Evans expects the range of business services to be greatest in the largest city in the economy and the cost of provision of any service will tend to decline with city size, as the demand for the product increases and economies of scale become possible. But since land and labour will be used in the production of the service, the cost of the services as a function of city size will not decrease continually but will start to increase at some point, first at an increasing rate and then at a decreasing rate, as shown by the curve AA' in figure (4.7). The curve AA shows the cost of supplying the service if the cost of land and labour did not vary with city size.

(1) For the details of the assumptions, See Ibid, PP.50-51.

Figure (4.7)

Cost of Services as a Function of City Size

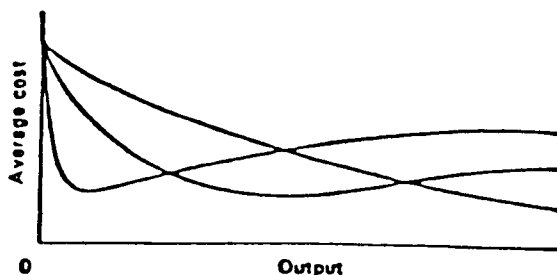


Source, Alan W. Evans, op.cit., Fig.(12), P.61.

The model shows, that "the cost of supplying each of the various business services as a function of city size will be different and can be presented by a different supply curves." Services which can achieve all the attainable economies of scale with a small output will be supplied at minimum cost in a small town or city, particularly if the production process uses little capital and a lot of land and labour. On the other hand, services which require larger output to achieve all the economies of scale and which use a lot of capital and little land and labour will be supplied most cheaply in the largest city in the economy and even there, all the economies of scale may not be achieved. There possible cost of supply curves are shown in figure (4.8).

Figure (4.8)

Cost of Different Services as a Function of City Size



Source, Ibid, figure (13), P.61.

By calculating the cost of each input as a function of city size and adding the various costs together, the firm and/or individual will be able to find the city which minimises its costs. The calculations are illustrated diagrammatically in figure (4.9).

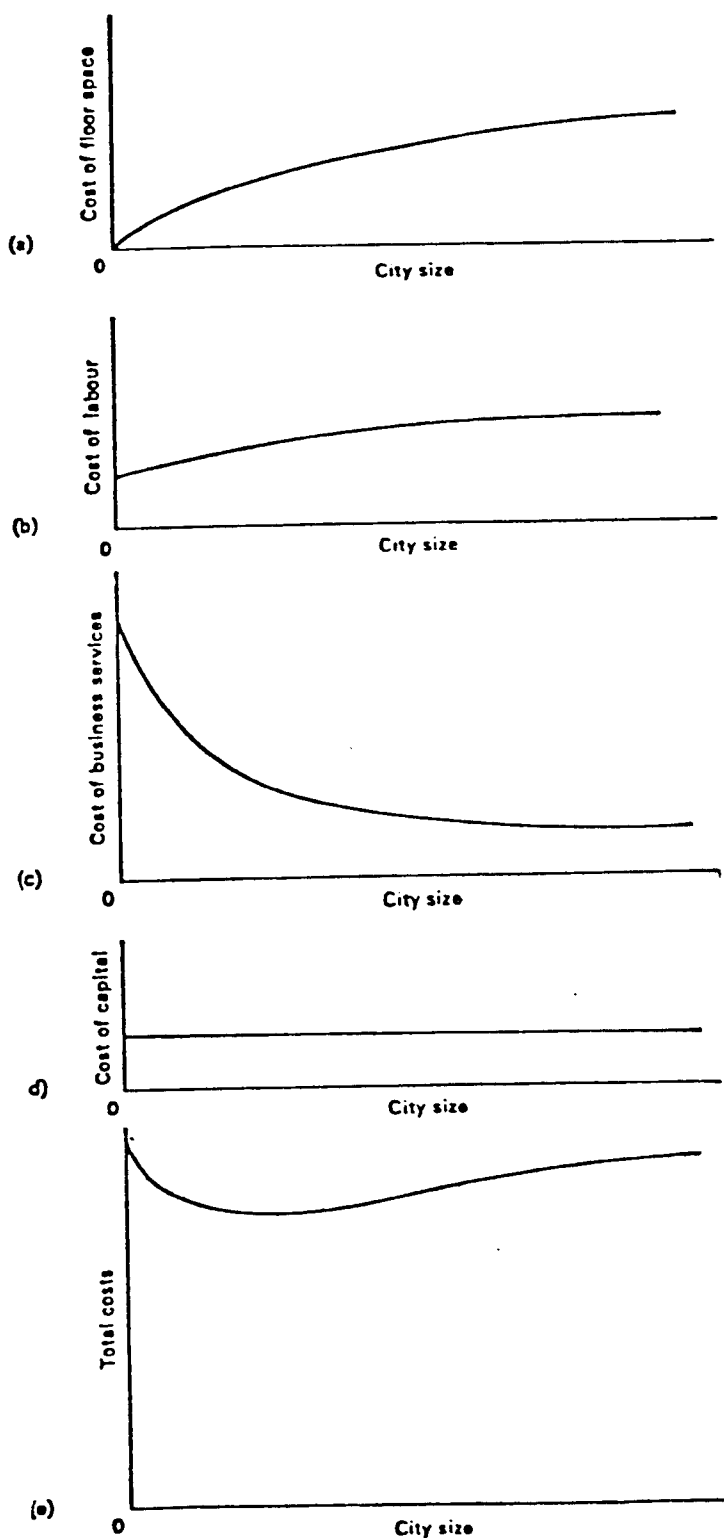
The curve showing its total costs as a function of city size is shown in part (e), and is found by summing up vertically the curves in part a, b, c and d.

According to the above analysis, the theory concludes that "when cities are small, the total costs of the firm fall as city size increases because of the decreasing cost of business services outweighs the increasing cost of labour and floor space. At some city size total costs are constant for small changes in city size and this is the firm's optimal location; the rate of decrease of cost of business services exactly equals the rate of increase of the cost of labour and floor space. When cities are larger in size the increasing cost of land and labour outweighs the decreasing cost of business services and the firms total cost increase as cities increase in size". The theory noted that a stable equilibrium location at some intermediate city size is only possible if the cost of at least one of the three inputs, land, labour or business services, either decreases at a decreasing rate or increases at an increasing rate.

The resulted hierarchy of cities, out of the above mechanism, in which every firm and/or individual maximise its own profits (or net benefit) would not necessarily be socially optimal. The divergence from optimality is greater in small cities than in large cities. This conclusion runs counter to much theorising on city size in which it is usually argued that very large cities should be reduced in size implying that the deviation from optimality increases with city size (above a certain size).

Figure (4.9)

Cost of Inputs as a Function of City Size



Source, Ibid, Figure (14), P.63.

Finally it should be pointed out that the theory placed special emphasise to the role of changing transport technology on city size distribution. The theory argues that increasing the speed of commuters transport or the relative declining in the cost of commuting will lead small cities to lose population whilst large ones will gain population. (1)

Although Evans suggested an interesting economic theory of city size distribution. The theory is far from being a general and comprehensive one. Richardson, noted that the defect of the theory is that, "...as it stands, there is no mechanism for generating the kind of city size distribution observed empirically." (2) For Evans argument of decreasing the number of cities in a given size class as cities increase in size depends upon the number and size of firms (or households) seeking locations in cities of particular size. Thus there will be a large number of very small cities only if a much larger number of firms (or households) find their ideal locations in cities of this size. In other words, "Evans has neglected in his analysis the individual preferences as a main locational factor for firms (and/or households)." (3)

Evans himself, rightly believes that the theory presented in the paper discussed here, is inadequate in two respects. (4) In the first place it fails to take uncertainty into account. Uncertainty, as it has been shown earlier in this study, is an important factor, in deciding the location of any economic activity and consequently in building a general theory of city size distribution. Hence developing such theory which allowed for risk and uncertainty would be a question

(1) For details on this point see Ibid, PP.72-75.

(2) H.W.Richardson, "Theory of the Distribution...." op.cit., P.246.

(3) Ibid, P.246.

(4) Alan W. Evans, op.cit., P.75.

of search despite its difficulty. In the second place, "the theory fails to incorporate a theory of the intra-urban location of firms. The assumption that all employment is located at the centre of the city is a considerable simplification but it obviously conflicts with the facts."

4.2.4. Optimality in City Size Distribution

Among the criticisms that have been made of the notion of optimal city size is that it is not immediately consistent with the framework of the growing system of cities. The models of optimal city size which ignores space and treats the city as an isolated unit misjudges the fact that the city may be one unit in a complex national urban hierarchy. As it has been seen in the previous chapter, the prevailing hierarchical system and the space separating urban areas are important factors which determine the overall wellbeing of the society and economic development. Accordingly, the problem of how to distribute total population efficiently over a national urban hierarchy is much more stimulating than that of determining an optimal city size under very restricted conditions. One of the approaches dealing with the problem of determining urban hierarchy, through incorporating it into urban area production function has been dealt with in section (4.2.1.) of this chapter. Another model dealing with the problem will be introduced here, that is, Tisdell's model of optimal city sizes.⁽¹⁾ The model takes into account, the social objective or preference functions which is to be maximised, in determining an optimal pattern of national settlement.

(1) C. Tisdell, op.cit., PP.61-70.

In his theory, Tisdell believes that "The optimal size of city cannot be determined in isolation for ideally one should try to discover settlement patterns which maximise overall social welfare in the economy, taking into account the preferences of individuals and the nature of production possibilities at all possible locations." Also, the optimal size of settlement defined according to classical type of approach may not be the size which ensures an optimal location of the population of the nation. Hence, the main purpose of Tisdell was to consider, under very simplified conditions, the types of national or urban settlement pattern which are ideal, the actual patterns which may arise and policies to promote an optimal pattern of settlement.

In his analysis, Tisdell treated the city as if it is common property, hence the theory has application to the allocation of common property resources generally. Tisdell's theory was the first to utilise extensively the common property resources when collective economies of scale occur. To build his theory, Tisdell assumed that:

First, the resources of an urban settlement can be regarded as if they are common property for their inhabitants;

Second, for simplicity, it is assumed that all share equally in the opportunities of the city in which they reside;

Third, there is a given number of sites for settlements in the country and that each site has a relevant input-output relationship which depends only on the population at the site;

Fourth, each site is treated as if its community is self-contained and trade between areas or sites is ignored; and

Fifth, population may migrate between sites, and variable resources may also move in fixed proportion to population.

After visualising many constraints and assumptions, such as the constraints of the number of sites available, the variation in the income function between different sites and so on, Tisdell concluded, from the analysis based on the linear segmented production or income⁽¹⁾ functions, that:-

First, "...the classical optimal size of settlement may not be optimal in terms of a national settlement pattern. Furthermore, it may be impossible to maximise overall income unless income per head is held at different levels at various settlements...., this creates considerable difficulty for policies which aim to encourage a settlement pattern to maximise overall income or well-being."

Second, "...there is no tendency for an optimal national settlement pattern to be achieved by the operation of natural mechanisms. A sub-optimal equilibrium may be achieved in which some settlements are too large and some are too small.

(1) In his analysis, Tisdell pointed out that, "the well-being rather than income is the important goal to be considered in determining a national settlement pattern. Well-being curves for settlements may become concave when their population rises to high levels even though income curves remain convex. There may be an aversion to crowding, pollution, travel requirements and environmental problems which can become a marked importance in large cities." (Ibid, P.69).

In order not to rely upon the nebulous concept of well-being curves, Tisdell suggested that, "...it may be possible to develop the theory by assuming preference functions of particular type. Individual preferences might be related to their income and the population of a settlement. It is possible that at least up to a point many individuals may be prepared to trade-off income for the advantages of living in a larger settlement."

(Ibid, P.69)

Even under these circumstances, argues Tisdell, it is not difficult to show that some settlements may grow beyond a socially optimal size...., if individuals migrate in response to differences in the prevailing average well-being at sites.

(Ibid, P.69).

Third, "The natural mechanism will...ensure higher national income than initially but may not yield the optimal level."

Finally, Tisdell argues that because of the abstract assumptions made in the analysis, it may be dangerous to draw practical policy conclusions from it. Nevertheless, the analysis does point to some policy conclusions, and suggests that available policy instruments are sometimes incapable of achieving an optimal national settlement. Among the policy implications are:

First of all, "The analysis based on the linear segmented production or income functions seems to have special relevance because it allows for increasing returns once a settlement grows beyond a particular size. Under these conditions, a fairly even spread of population between sites is frequently sub-optimal....The selection of a few growth centres is required rather than the encouragement of the population growth of many centres. A degree of concentration is required to take advantage of the available economies of scale. That degree and nature of concentration depend upon the properties of the income or production functions."

The theory also suggests that "while a policy of selectively encouraging settlements to grow above a threshold size may be sufficient in some cases to achieve optimality of the settlement pattern and indeed be preferable to no interference, under other circumstances it is difficult to devise policies which will always maintain an optimal settlement pattern."

Finally the theory suggests that, "it may be possible to achieve optimality by controlling internal migration. In the absence of controls on migration, measures such as taxes and subsidies aimed at equalising income are liable to encourage a sub-optimal settlement pattern in some cases."

The above approach of optimal city sizes is clearly a very abstract one. For example, it does not take trade between settlements into account. Although, Tisdell argued that the importance of this factor can be eliminated as many goods cannot be traded over long distances or that it is costly to transport them, its absence continues to be a main drawback of the theory. Again, Tisdell himself pointed out that "...incomes and wellbeing of individuals differ within a settlement, but it seems to me that this can be allowed without affecting the main import of the theory..."

At last, the theory stressed that, in the investigation of actual settlement patterns average rather than marginal relationships appear to be more relevant.

4.3. Empirical Documentation of the relationship Between Costs and Benefits and City Sizes

Theoretical formulations for any problem, especially planning and developmental problems, do not give a concrete bases for policy makers and politicians. Empirical support for such generalisations and formulations would help a lot in adopting specific development strategies. Hence, many important questions could be raised here. Does the empirical evidence of the relationship between costs and benefits and size of population of urban areas support the theoretical formulation? If yes, to what extent the two phenomena coincide? Is there a unified optimal size for every examined criteria? Are there any differences between different countries of different levels of economic development? These and other questions will be answered in this section. Empirical validity of different quantifiable and unquantifiable criteria will be reviewed. It will include mainly, income and cost of living, cost of provision of public services, transportation and congestion costs, environmental quality and

miscellaneous relationships.

4.3.1. Income and Cost of Living and City-Size

Surveying the treatment of this topic in the literature, one finds a wide variety of results regarding the relationship between income distribution, city size and urban growth. Duncan and Reiss⁽¹⁾ were among the first to comment on this relationship. Finding that the Gini concentration ratio of personal income for US in 1950 declined as urban population rose, they suggested that the distribution became more equal because increasing city size was associated with a rising average income level. They did not hypothesise as to what effect, if any, city size has independent of income.

A study by Fuchs is a good source of data on money income differentials by city size.⁽²⁾ He found, for every one of his four macro regions of U.S., that the higher the size of the urban area the higher the wage rate is. He also estimated cost of living as a function of S.U. (SMSA) size (non-metropolitan area population size was set at 25,000) and regions for the 1966 base year. Applying regression analysis, he found that there is a fair increase in the cost of living index with city size. On the contrary, Shefer⁽³⁾ taking correlations of ranks of cities and rank of living costs concludes that no association exists between the cost of living and the population size of an urban area and accordingly the higher money incomes in larger cities should be result in higher living standards. Hoch, measuring the deflated money income levels for standardised population, for different urban sizes and regions of U.S. found that, "The general

(1) D.D.Duncan, and A.Reiss, Social characteristics of urban and Rural Communities, Wiley, New York, 1956.

(2) V.R.Fuchs, "Differentials in Hourly Earnings by Regions and City Size, 1959", National Bureau of Economic Research, Occasional Paper 101, New York, 1967.

(3) D.Shefer, "Comparable Living Costs and Urban Size: A Statistical Analysis", Journal of American Institute of Planners, Vol.36, 1970, PP.417-421.

pattern of results...fits the hypothesis that there are additional compensatory payments beyond cost of living compensation."⁽¹⁾ The differential between largest size group (over a million) and smallest (less than 10,000) was only 7% for the North East region, but range from 15-30% for the other three regions.⁽²⁾ The New York SMSA per capita income shows to be 35% above the U.S. average. Hoch attributed this rise to the following items: "around 9% of this total can be ascribed to cost of living differences, 18% to other compensatory payments, and 8% to differences in population composition."⁽³⁾

Many other scholars also, elaborated on the correlation between income and size of city. Richardson⁽⁴⁾ recognised that average income was highly correlated with city size. But he was aware of the possibility that the income distribution might be less equal in bigger cities because the opportunities for high income is greater in large cities than small ones. To investigate the connection between income distribution and city size, he examined how the average high/low income ratio in 1960 varied across SMSAs of increasing size. Using this admittedly crude measure of income inequality, Richardson concluded that the income distribution became more equal as city size increased. In contrast, Murray⁽⁵⁾ implied that beyond a certain population level (300,000 total families), city size would not affect the income distribution. Any variation between SMSAs in inequality, which she measured by the interquartile variation, was more likely to result from differences in industry mix, racial composition and income level.

(1) Irving Hoch, op.cit., P.311.

(2) Ibid, P.311.

(3) Ibid, P.315.

(4) H.W.Richardson, The Economics of Urban Size, Saxon House and Lexington Book, Westmead and Lexington, 1973.

(5) B.B.Murray, Metropolitan Inter personal Income Inequality", Land Economics, Vol. 45, 1969, PP.121-125.

Alonso, discussing the question of city size and national policy, recognised that "examining the data on per capita income of metropolitan areas in certain ways (but not in others) suggest that there may be some decline in per capita income above a population of about three millions."⁽¹⁾ This does not mean that diminishing returns set in after this size. Alonso, attributed that to two factors⁽²⁾ First, the definition of the SMSA of the Census misses considerable ex-urban high-income population in the largest urban areas, so that the decline may be more apparent than real. Second, these few very large urban areas perform certain functions for the national system of cities which may lower their own per capita income while serving the national interest as a whole. To Alonso, urban size is a measure of the opportunities to which an inhabitant or enterprise has access. Income per capita is strongly correlated to population potentials, which is a mathematical measure of the accessibility available to residents of the city to the population of the rest of the country. Thus, "a small metropolis in an area of high population potential will usually have as high a per capita income as a large but more remote metropolis."⁽³⁾

By analysing how labour supply and demand conditions varied with city size, Farbman⁽⁴⁾ was able to hypothesise explicitly that inequality would increase as city size increased. Farbman's empirical results were consistent with his hypotheses of direct relation between city size and inequality. Using family income data from 1960 US census, he found that the Gini concentration ratio increased as

(1) W. Alonso, "The Question of City Size and National Policy", in R. Funck, (ed), Recent Development in Regional Science, Kofersruhe papers in Regional Science, a Pion publication, London, 1972, P.112.

(2) Ibid, P.112.

(3) Ibid, P.112.

(4) M. Farbman, "The Size Distribution of Family Income in U.S. SMSAs, 1959, The Review of Income and Wealth, Vol. 2, 1975, PP.217-237.

city size rose. Farbman's estimate did not indicate how size affects inequality in cities over one million in population.

Muther, in an analysis of inter-city variation in occupational composition,⁽¹⁾ also suggested that the job opportunities in large cities would attract the most productive workers away from smaller cities and rural areas. Furthermore, he argued that the proportion of employment in growth industries which generate more skilled jobs increases with city size. Both these mechanisms imply that city size and income inequality will be directly related. Some evidence in support of this argument was provided by Muther's finding that city size was positively related to the relative occupation-mix earnings in SMSAs in 1960.

Burns⁽²⁾ found that urban size was not a statistically significant determinant of inter-city variation in the Gini coefficient for the US and the Netherlands in 1950 and 1960. He attributed this to the fact that city size was related to other independent variables more highly correlated with family income inequality.

A very recent study by Haworth and others concerning income distribution, city size and urban growth⁽³⁾ has found that income inequality varies directly with level of population providing further support for Farbman's finding that income inequality rises with city size. To reach this conclusion, drawing on basic economic theory, Haworth and his colleagues developed what they call "monopoly hypothesis" which suggests that increases in city size and urban growth will lead to greater income inequality. By using the Gini concentration ratio as a

(1) V.K.Muther, "Occupational Composition and its Determinants: an Inter-City Size Class Analysis", Journal of Regional Science, Vol. 10, 1970, PP.81-91.

(2) L.S. Burns, "The Urban Income Distribution: a Human Capital Explanation", Regional Science and Urban Economics, Vol. 5, 1975, PP.465-482.

(3) C.T.Haworth, et.al., "Income Distribution, City Size, and Urban Growth", Urban Studies, Vol.15, 1978, PP.1-7.

measure of family and male income inequality in 1970, they found that their regression results are consistent with the monopoly hypothesis. Their results suggest that the benefits of urban growth are unevenly distributed and increase measured income inequality.

To sum up, previous studies of the income distribution, city-size and urban growth relationship differ in their predictions as well as empirical finding using, mainly 1950 and 1960 data. Nevertheless, a basic assumption underlies most of the previous hypotheses. This is the notion that increases in city size and urban growth affect the income distribution via occupational or skill composition changes induced by in-migration of labour and business.

4.3.2. Costs of Public Services and City Size

A number of analysts have attempted to find the relationship between the cost of provision of public services and sizes of cities using cross-sectional data. Based either upon empirical observation or upon engineering estimates. Such studies found that for some urban services as water, sewage, public transport, road construction, school operation and so on, cost functions are U-shaped, initially declining and eventually rising at higher levels of either provision or urban populations. Schmandt and Stephens examining the local government expenditures in U.S. found that this expenditure did indeed decline initially and then tend to rise.⁽¹⁾ Their examination included 3,000 American county administrative units. Counties with one million population spent about \$200 per capita, against \$120 for counties with a population range 15,000-50,000. They argued that population was not the only factor effecting cost of providing public services. Median family income per county has shown greater explanatory value.

(1) H.J.Schmandt, and G.P.Stephens, "Local Government Expenditure Pattern in the U.S.", Land Economics, Vol. 39, 1963, PP.397-406.

Accordingly, they concluded that "wealth or resources (measured in terms of median family income and state aid) is far more important than population size or density in explaining variations in total per capita expenditures among local units."⁽¹⁾ Alonso supporting the above conclusion pointed out that, whereas the cost of public services rises by \$80 per capita between the two size categories, median per family income rises by \$1000, indicating a marginal propensity to consume such services of about 25 per cent.⁽²⁾

Earlier, Duncan⁽³⁾ in an empirical investigation of the problem of optimum city size, almost found a similar relationship. The study basing on existing data of 1940's on municipal expenditure show, in general, a direct relationship between city-size and per capita cost in most of the 14 categories of municipal expenditure (highway, sanitation, public welfare, schools,....etc.). However, these data reflect the separately varying factors of unit costs, amount and quality of services. Hence, they show little about municipal efficiency. At that time, Duncan was able, in only one area of municipal service, to establish some tentative optimum population, that is, the provision of residential electric service. He found that unit cost decline with increasing city size up to the million mark, with cities between a half and one million getting electricity the cheapest. This of course could not be generalised to define optimal city size.

Empirical studies concerning the relationship between cost of public services and size of cities, in developed countries other than U.S. is scarce. Nevertheless, in an important article Mera⁽⁴⁾ discovered a similar relationship in countries other than U.S. Mera using data from Japanese prefectural and sub-prefectural governments,

(1) Ibid, P.406.

(2) W. Alonso, "Urban and Regional..."op.cit., P.4.

(3) O.D.Duncan, "The Optimum Size of Cities", op.cit., PP.759-772.

(4) K. Mera, "On the Urban Agglomeration and Economic Efficiency", Economic Development and Cultural change, Vol.21, 1973, PP.309-324.

found an even more significant trend. Grouping the governmental units by population density as an indicator of the degree of urbanisation within each area, the U-shaped cost curve again emerges. Yet even more significantly is the rise in mean per capita income. Due to Japanese public resources allocation system, provision of services by prefecture is largely determined by the central government rather than willingness of inhabitants to pay. Hence, Mera concluded that this data closely reflects the quality-adjusted price curve.

Unfortunately, information from developing nations is very scarce. One study for India, however, has noted that if the quality of services is held constant, the per capita incremental cost of infrastructure declines significantly up to cities of about 130,000 population and then drops slightly until cities of one million inhabitants are reached.⁽¹⁾

These cases seem to suggest that the performance of the public service cost curves over various sizes of cities is a spurious guide to urban efficiency. Nevertheless, urban efficiency, and subsequently any decision that an optimal size of city exists, must be determined by other factors that are more concerned with the productive environment of the urban area. For, the conclusions, of such studies are suspect for a number of reasons:⁽²⁾ First, outputs of various services are assumed implicitly to be constant, with emphasis placed exclusively upon the cost of inputs. If the observed relationships between personal income and size of city are valid and if urban services are assumed to be income-elastic, it follows that residents of larger urban areas, because of their higher incomes, demand a greater number of higher quality services. This would tend to raise the per capita cost of such services at higher levels of population not because of the cost of the basic unit of service

(1) Standford Research Institute, Costs of Infrastructure for Industry as Related to its Size in Developing Countries: India Case Study, Menlo Park, California, 1969.

(2) W. Alonso, "The Economics of Urban Size", op.cit. PP.67-83.

but because the unit of service itself changes with city size;

Second, It differentiates between public and private costs. In most developing countries, public services are largely provided by the public sector, although even here significant exceptions exist. Yet the empirical evidence which exists relates primarily to developed countries, and it is these data which are incorporated into the studies. In Western cities, public transport can be either provided by private or public sectors. This could be applied to almost all other urban services. Hence, moving from community to community, such divisions can be seen to be arbitrary and consequently a less than adequate guide to true public cost of the provision of such services;

and Third, the costs associated with urban services are not really economic costs at all but merely transfer costs that may result from institutional arrangements. As Alonso notes with respect to education for example, "It is unclear, in fact, how much of education is a production cost (training people) and how much of it is a form of consumption (educating people)."

4.3.3. Transportation and Congestion Costs

As it has been seen, it is difficult, on the basis of the cost of urban services alone, to reach the conclusion that either a unique optimal size of city exists or that any particular cities themselves are too big. It is readily apparent that significant economies of scale in the provision of such public services probably exist and that they extend over a wide range of urban sizes. Yet as urban size increases, another set of costs are triggered off which cannot be so lightly dismissed. These concern the costs of transportation and congestion, pollution costs and so on.

Four decades earlier, Duncan noted that "the cost analysis of transportation, indicate the advantages of time, expenditure and convenience all lie with the moderate sized or small city."⁽¹⁾ The study found that, some form of local transportation is apparently required in cities over 15,000, and families in cities over 100,000 spend more than four times as much for non-automotive transportation as families in smaller cities.⁽²⁾

More recently, Rees and Schultz⁽³⁾, also recognised the positive effect of city size on transportation cost. They noted two possible ways of compensating for the time and money costs of intra-area commuting: higher wages or lower rents, depending on the distribution of employment and residences. They noticed that both adjustments as occurring in the Chicago area, with large establishments having to pay wage premiums to attract workers from outside their areas. Rees and Schultz examined wage rates for a sample covering a dozen occupations. Distance was included as an independent variable in regressions explaining wage rates; it had a positive coefficient in eleven cases, with five cases significant at the 0.05 level. The study found that for a one-way trip work of 16 miles per day, estimated travel compensation ranged from 2% of mean earnings for janitors to 13.5% of mean earnings of accountants.

The U.S. inter urban transportation studies regarding estimated average work-trip length and duration for auto drivers and time spent by heads of families in daily work-trips, shows increasing distance travelled as well as increasing time cost per mile as a function of city sizes.⁽⁴⁾ On the other hand, the wage survey data, used in Hoch study,

(1) C.D.Duncan, "The Optimum Size of Cities", op.cit.P.761.

(2) Ibid, P.762.

(3) A. Rees, and G.P.Schultz, Workers and Wages in an Urban Labour Market, University of Chicago Press, Chicago, 1970, PP.169-174.

(4) Irving Hoch, op.cit. P.316 and tables No. 13 and 14. P.317. which give examples on the evidence.

indicated that "hours of work declined with both population size and density, the latter factor being the most important... The decline in hours of work is likely to be a response to the time cost of traffic congestion."⁽¹⁾ Thus the decline for the New York SMSA was about a half-hour per day, consistent with the differential in journey-to-work-time.

Meyer, Kain and Wohl, in 1965⁽²⁾ consider the question of congestion changes at some length, and argues that (a) they are probably politically infeasible and (b) rationing by congestion does not necessarily yield mal-allocation of time costs, because high income persons are more likely to be able to arrange their own travel times. The total cost of congestion must be significant. A study by Neutze⁽³⁾ estimated congestion costs for developed countries. Neutze using Australian data, suggests that each new resident in Sydney causes an increase in traffic congestion to present residents costing £32.4⁽⁴⁾. On the assumption that a 40 per cent labour participation rate exists, diversion of one job from Sydney to other less congested cities represents a saving to residents of Sydney of something in excess of £80. Neutze argues that in such cases, a subsidy appears to be justified. As Sydney continues to grow in size, such cost would be expected to increase further.

The congestion and transportation costs associated with large cities are not private costs alone but include societal costs as well, and as a result, are highly elusive from quantitative assessment. Although, in developing countries, studies concerning estimation of

(1) Ibid, P.317.

(2) J. Meyer, et.al. The Urban Transportation Problem, Harvard University Press, Cambridge, Mass., 1965, P.340.

(3) G. M. Neutze, op.cit.

(4) Ibid, P.58.

congestion costs do not exist at all, it is believed that, congestion problems reach their peak, in cities of these countries. The congestion of such cities as Caracas, Rio de Janeiro, Bombay, Bangkok, Sao Paulo, Cario, and Lagos are legendary, and movement within such cities is one of the most pressing of all urban problems. This can be attributed mainly to the backwardness of transportation system and modes in most cities of developing countries.

Considering two of the very many consequences of congestion, one can imagine the costs associated with congestion. First the World Bank, in its urban transport sector papers, notes, the running cost of motorised vehicles are generally lowest at speed from 30 to 40 miles per hour. At speed below 20 miles per hour in congestion, running cost can be expected to increase in proportion to journey time.⁽¹⁾ The operating cost, which is mainly determined by the cost of labour, will also rise as a result of raising journey times. Second, Beesley (1965)⁽²⁾, developing the notion of time costs of journey, noted that work trip time is valued at about one-third the wage rate; given increasing wages with size of city, the price per unit, as well as, the quality will increase with city size.

To sum up, the nature of transportation and congestion costs are far more speculative. Although it seems likely that mobility costs rise with the scale of an urban area, such a conclusion is based on scant empirical evidence plus logic and observation. Obviously, this is a field that needs further research.

(1) World Bank, Urban Transport: Sector Policy Paper, International Bank of Reconstruction and Development, Washington, D.C, 1975, P.78.

(2) M.E.Beesely, "The Value of Time spent in Travelling: Some New Evidence", Economica, Vol.32, 1965.

4.3.4. Environmental Quality and City Size

There is a good deal of evidence that environmental quality, on net, declines with city size and density. More precisely, for a given level of expenditures per capita on environmental management, quality declines with urban scale, or if a quality standard is specified, monetary cost to attain that standard increases with scale. However, like the congestion cost, precise estimates of the actual cost of this externality is difficult to derive.

Hoch, gives a strong evidence that, mainly, negative effects of large cities on environment quality prevail. His findings could be presented as follows:⁽¹⁾

1. "Preliminary work relating air pollution by type to a number of explanatory variables, using regression analysis, indicated that city size and/or density are generally statistically significant even with the introduction of other explanatory variables, such as indexes of industrial output, gasoline sales and January temperatures, viewed as an index of fuel consumption in space heating."

2. "Climate can be classified under air quality and here, too, there are urban size effects. Temperature, precipitation, cloudiness and dust particles increase, while relative humidity, ultraviolet radiation and wind speed decrease with city size." The study found, that, the mean annual increase in temperature is on order of two degrees fahrenheit, though for large cities the CBD temperature increase relative to the rural fringe is considerably larger, with a reading of four degrees difference for Washington D.C, and 12 degrees for London. The temperature differential, is particularly pronounced at night. Precipitation and cloudiness are about 5%-10% higher for cities relative to their rural hinterland, while wind speed and ultraviolet radiation are about 25% lower.⁽²⁾ Hence, climate effects,

⁽¹⁾ Irving Hoch, op.cit., PP.318-319.

⁽²⁾ Ibid, P.319.

on net, may be negative, though the evidence is hardly clear cut.

3. The evidence is stronger for noise, and for solid waste disposal costs.⁽¹⁾ Outdoor noise levels in central sections of large cities are on the order of twice the perceived level in the residential areas of those cities, in turn twice the perceived level in suburban areas or small towns. On the other hand, most of the costs of solid waste disposal (75-90% of total costs) are for collection and transportation to the disposal site - either landfill or incinerator. Although there are some scale economies in both landfill and incinerator operations, these appear far outweighed by collection and transport scale diseconomies. Treating cost for an SMSA of 100,000 population as base, available evidence indicates that relative cost of disposal is 60% greater for an SMSA of two millions, and 80% higher for one of 10 millions. This is well above the increase to be expected from increases in wages with city size.

4. Water pollution management costs show a pattern at seeming variance with other aspects of environmental quality. Thus, engineering evidence shows that per capita costs for sewer systems decline with density, and that per capita water waste treatment costs decline rapidly with urban size for pollution up to 100,000 though with modest declines thereafter at best. However, a number of items of empirical evidence suggest that sewer and treatment cost may be U-shaped, increasing after a certain point is reached. This may be attributed to the fact "...that large cities will generally be forced to engage in high cost 'tertiary' treatment, which obtains greater removal of pollutants than the standard primary (settling) and secondary (bacterial) treatment."⁽²⁾

(1) Ibid, P.319.

(2) Ibid, P.319.

In sum, water quality problems may be similar to other aspects of environmental quality, after all, reinforcing the conclusion that quality decline and/or management cost per capita increase with urban size and density.

4.3.5. Miscellaneous Effects of City Size

The effects of size of a city are not limited only to the above main aspects. They extend to include many other like aspects, i.e. public safety, psychological and social characteristics of urban life, public recreation and so on. Duncan,⁽¹⁾ studying such relationships found that, in general, large cities have negative effects on different welfare aspects of life. He found that public safety is less insured in large cities of U.S where; a tendency for crime rates, as measured by crimes known to police or by persons charged, to increase with city size; per capita expenditures for city police forces increases directly with city size. Later on Hoch, making two kinds of observations, the first consists of observations on 99 California cities of all sizes classes and the second consists of observations on central cities of over 250,000 persons as of 1967 noted also that "It is likely there is some increase in overall crime cost with city size and density..."⁽²⁾; automobile accident occurrence rates based on population are lower for cities between 10,000 and 50,000 than for larger cities. The larger the city, the more lethal an instrument the automobile becomes; and in regard to fire hazard, Duncan's study shows no clear association with city size. The result varies according to the statistical measure chosen. Per capita fire loss, in dollars, shows little systematic association with city size. Fire loss expressed as a percentage of total real property value found to be larger in the cities of 30,000-50,000 than in cities over 1,000,000. The annual number of fires per capita is related

(1) O.D.Duncan, "The Optimum size of cities", op.cit., PP.759-772.

(2) Irving Hoch, op.cit., P.323.

inversely to city size with fires being relatively one-third more frequent in cities 25,000-50,000 than in cities 50,000 and over.

On the other hand, Duncan's study found that the larger the size of the city the more diversified and the higher the quality of many services, such as, educational services, health services and recreation services.⁽¹⁾ In the same line, Cox⁽²⁾ reviewing the literature cited examples of specialised services related to city scale: medical services, live theatre, quality universities, libraries. He noted "Whereas shoe shine parlours, hat cleaning shops, and fur repair shops appear in cities above 25,000 population, diaper services appear only in cities over 50,000."⁽³⁾

Finally it is claimed to find evidence of greater "social contentment" in cities below 25,000 in the fact that survey respondents there voice fewer complaints on certain questions about neighbourhood and community characteristics.⁽⁴⁾

Such benefits, of course, yield some offset to the negative effects of city size.

4.4. Summary of Chapters Three and Four

The question of city-sizes and distribution have been discussed for a long time and in different contexts. Its importance stems from the fact that it is relevant to all societies regardless of their level of development, location or cultural background. The review of the literature on the city size distribution models and theories suggests that the following conclusions could be drawn:-

First, many of the models and theories examined were found to be satisfactory in the sense that they generate size distributions of cities that are consistent with those found in the real world. Among those models

(1) O.D.Duncan, "The Optimal Size of Cities, op.cit., PP.762-771.

(2) D.Cox, Economics of Population Distribution, Ph.D.Dissertation, Dept. of Economics, Stanford University, 1969, P.35.

(3) Ibid, P.35.

(4) O.D.Duncan, "The Optimum Size of Cities", op.cit., P.771.

are the hierarchical models of Christaller, Losch and Beckmann, the rank size distribution and Friedmann's core-periphery model. However, it is improbable that any one of these models would be universally acceptable, where there are so many influences interacting to mould the relative size of cities that it would be too difficult to include them all within a single model. As it will be seen later in section (7.1) of this study, most of the examined models and theories, for the purpose of simplifying and expediting the analysis are:

(a) based on one or very few factors in explaining the city size distribution. These factors are found to be either the city size or city rank in case of the statistical models; market areas, costs of provision of services, income or number and type of industries in case of hierarchical models; individual preferences of city size, cost of inputs or production functions in case of optimality in city size models and so forth. In total most of the city size distribution models represent partially the urban functions. As it will be seen in section (7.1), only Friedmann's model will be shown to meet this aspect, where the model incorporated multiple factors in the analysis. These factors are represented by social, political, geographical and economic ones. Tisdell's model of optimal city sizes also seems to meet partially this aspect, where he considers the social welfare, individuals preferences and the nature of production possibilities at all possible locations.

(b) based on certain unrealistic assumptions. These assumptions extend to include perfect competition, homogeneous distribution of purchasing power, the existence of homogeneous plain over which resources are uniformly distributed, a closed economy, identical individual preferences, employment located in the centre of a city, the opportunities existing in a city are shared equally between its inhabitants and so forth.

These and many similar conditions do not exist even in countries where originally the city size distribution theories and models were built.

(c) most of these models and theories are static ones, i.e., they do not provide the opportunity to predict the future urban size distribution, taking into consideration the expected future changes in the prevailing socio-economic and physical aspects. The hierarchical and statistical models, for instance, deal with existing pattern of urban sizes without being able to predict the future urban size distribution. They do not explain development phenomenon and they neglect almost all important macro-economic interrelationships. They only aim at explaining the existence of certain patterns of centres and do not explain how this pattern has come into being or what the pattern would undergo in the future. As it will be seen later in section (7.1) only Friedmann's model is seen to meet this point and Price's model of individual preferences and optimal city size is shown to have met it partially, where Friedmann's model assumes that each of its four stages is transitional. Friedmann regards even the last stage as subject to transition to a still unknown pattern when he stated that whether further pattern lie beyond the functionally interdependent system of cities stage, must in the absence of historical experiences, remain an open question. To incorporate an element of dynamism, Price illustrates the response of the hierarchy to change by giving three alternative assumptions: first, population and preferred size of city grow at the same rate, second, size preference increases and population does not, and third, tastes are stable and population grows.

(d) only 2 out of the 22 examined models (see table 7.1) consider the space separating urban centres, as well as the city size distribution. These two models are Christaller's and Losch hierarchical models. By ignoring space the city size distribution models misjudged the importance of the space separating urban centres for the well being of the population and economy of a nation or a region. This is true, since as it has been

seen, the distribution of cities in space, in particular the distances between all cities and their closest neighbours, as well as their distances from the biggest centres of economic activity, influences the degree of economic integration of the cities within the national economy and hence the level of external economies (and diseconomies) that the economic units in a particular city enjoy. However, the proper urban growth policy is the one which balance among the conflicting forces of centralisation and decentralisation urban growth strategies and which tries to maximise generative aspects of the urban growth environment.

Hence, basing on the above limitations, the resulted city size distribution theories and models are far from being a general urban growth models or theories. Furthermore, the above analysis suggest that, a multi-disciplinary approach to the urban growth and city size distribution problems, is not merely desirable, it may be essential to a deeper understanding of urban growth, simply because it will rest on a more realistic basis. However, the question of whether a theoretical formulation provides the basis for such a multi-disciplinary approach remains; how ever complicated it is, an open challenge for further research.

Second, the literature review suggests that the existence of a well spaced hierarchical system of cities is very important, both for the well being of the population and the economy of the nation or region. It has been found that a hierarchy of cities is an efficient system for promoting national growth and for producing and distributing goods and services to society. The national and regional hierarchy of cities fulfil many purposes that give justification to the view that it is an instrument for achieving national growth. It is found that, first, there is a tendency that the higher the order of an urban place in the hierarchy the greater the opportunity of invention and adaptation of new ideas and technology;

second, a hierarchy of cities permits specialisation, division of labour and differentiation in economic function; third, the leading city in a nation or region plays an important role in the development of that nation or region. On the contrary, the review of the optimality in city size models suggests that although there is some empirical evidence of city size, basing upon the cost of urban services alone, it would appear difficult to reach any conclusions that an optimal size of city at a given population level exists. Even from a theoretical view point the search for the optimal city size encounters many problems. There is a wide agreement among scholars to reject the suggestion that any specific optimal state for city sizes exists because of the enormous functional complexity of contemporary urban system and the varying degree of sectoral and regional specialisation within those systems. Hence, as Richardson, among others, argues "There may be more sense in trying to identify efficient ranges of city sizes between a minimum threshold and a scale of which further increases in size are not accompanied by additional agglomeration economies. Even so, we may expect the efficient range to vary, possibly dramatically, according to the functions and structure of the cities in question".⁽¹⁾ Moreover, Richardson adds that "..., a national urban policy ought not to include measures to attain optimal size for an individual city. Optimality in this context has no real meaning. Even if this were not the case, from the view point of national policy an artificial system of cities of "Optimal Size" would be less efficient than a hierarchy both for economic growth and for providing an array of different environments for businesses and people."⁽²⁾ This last statement confirms the conclusion regarding the importance of a hierarchical system of urban centres.

(1) H. W. Richardson, "Optimality in City Size...." op.cit., PP.29-30

(2) Ibid, P.46.

Third, the rank-size literature suggests that regularities in the city size distribution can be detected in different parts of the world, developed as well as developing. Although the occurrences of the rule is more apparent in the developed countries and it lacks theoretical justification but it could be a useful analytical device for the purpose of explaining the balances in the urban hierarchy in the developing countries.

Fourth, the theoretical as well as the empirical evidences suggests that economies of scale could be achieved with increasing city size. The optimality in city size models reveals that production and many input costs, especially the businessservices costs, decrease with increasing the city size up to a certain level depending on the items under investigation. The empirical evidence confirms the theoretical ones and suggests that considerable economies of scale could be achieved with increasing urban size. This is particularly true in case of the cost of provision of public services and utilities. This generalisation could again be used as an important device in urban planning policies, especially those concerning the public resources allocation. Its occurrences could be checked in any region, the U.E.R. is no exception. However, it should be noted that despite the importance of the expected economies of scale in specific urban functions, one should be aware of the expected diseconomies of urban size, especially those associated with the quality of urban environment, congestion and social disturbances.

Finally, it should be noted that further conclusions to be drawn from the examination of these models and theories will be presented when re-examining their applicability to the problem of urban growth pattern in the U.E.R., in Chapter Seven.

PART II

URBANISATION AND SPATIAL DEVELOPMENT
IN IRAQ AND THE UPPER EUPHRATES REGION

CHAPTER FIVE
SPATIAL DEVELOPMENT AND URBANISATION
IN IRAQ

CHAPTER FIVE

SPATIAL DEVELOPMENT AND URBANISATION

IN IRAQ

INTRODUCTION

As it has been seen earlier, a close association exists between economic development and urbanisation processes. To examine the causes of the rapid urban growth in Iraq and to find out the possible association between the above two processes, in case of Iraq, this chapter will first provide an introduction to Iraq. Second, it will examine the population growth, distribution and urbanisation pattern of the nation. Third, it will examine briefly and quantitatively the structure of the Iraqi economy. Fourth, the chapter will discuss, the general spatial development of the economy and in particular the industrial development, throughout the last three decades. Finally, the similarities between urbanisation process of Iraq and that of the other nations, especially the developing ones, presented in Part I of this study, will be emphasised in this chapter wherever that is applicable. However, the treatment of the above aspects is by no means complete. It is an overview and thus brief.

5.1. Iraq in General

The republic of Iraq is situated in the South-West of Asia, to the North-East of the Arab homeland, bounded on the North by Turkey, on the East by Iran, on the West by Syria, Jordan and Saudi Arabia, on the South by Arab Gulf, Kuwait and Saudi Arabia, (See map (5.1)). Iraq lies between latitudes $29^{\circ}5'$ and $37^{\circ}22'$ North and between longitudes, $38^{\circ}45'$ and $48^{\circ}45'$ East.⁽¹⁾

Iraq covers 438317 sq.km. Its total population, according to the general population census conducted in October 1977 was 12000497 persons.⁽²⁾ The number excludes Iraqis abroad. Accordingly, the average population

(1) Central Statistical Organisation, Annual Abstract of Statistics, 1978, Ministry of Planning, Baghdad, 1978, P.5.

(2) Ibid, P.27.

The Republic of Iraq and its Administrative Divisions



density is about 27 person/sq.km., which is relatively low compared to other countries, developed, as well as less developed ones. This indicates that Iraq does not have the problem of over population as other developing countries have, especially as it contains a huge economic potential. The low population density remains even when the desert zones are excluded.

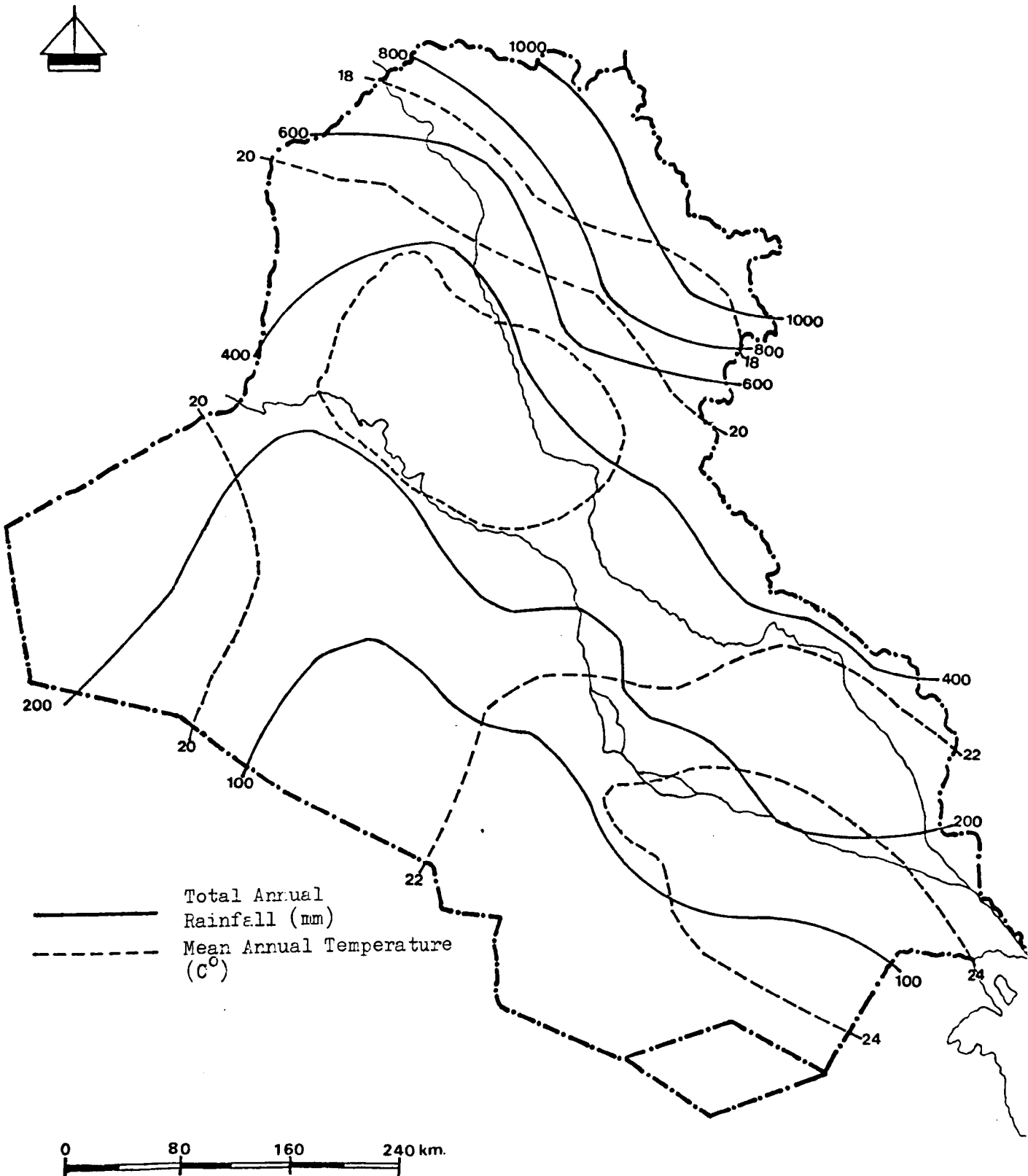
Topographically, Iraq consists of four main physical divisions; the alluvial plain which form 1/5 of Iraq's area and mainly situated in the central part of the country; the desert plateau which is situated in the West of Iraq and forms about 3/5 of the country's area; the mountainous region which is situated in the North and North East of Iraq and forms 1/5 of Iraq's area; and the terrain region, which is a transitional region between lowlands in the South and high mountains region. It forms 75% of the mountainous region.⁽¹⁾

The country has two main rivers, the Tigris and the Euphrates, which flow from the north to the south where they meet in Shatt Al-Arab, ending in the Arab Gulf. There are many small tributaries which start in the mountains and fall in the main rivers. There are also the deltas ending in the marshland in the South.

The climate of Iraq is continental and subtropical, with a rainfall system similar to that of the Mediterranean, with rains in the winter, autumn and spring. Three types of climate can be distinguished in Iraq, that is, (a) Mediterranean climate in the North East, (b) hot desert climate in the South West, and (c) semi-arid climate: a transitional climate between mountainous region in the North East and the hot desert in the South West (See map (5.2)).

(1) Ibid, PP.5-6.

Temperature and Rainfall in Iraq



Source, Central Statistical Organisation, Annual Abstract of Statistics, 1974, Ministry of Planning, Baghdad, 1974.

Administratively, Iraq is divided into Muhafadahs.⁽¹⁾ Each Muhafadah is sub divided into Qadhas, which in turn are sub divided into Nahiyas serving their own population and the hinterland rural population. At the start of 1978 there were 18 Muhafadahs, 98 Qadhas and 238 Nahiyas.⁽²⁾ In 1974, the Kurdish Autonomous Region was created, giving the Kurdish sub regions of Sulaimaniya, Artil and D'hok, autonomy within the united framework of the country. The Autonomous Area has its own legislative establishment. It has also an executive establishments to exercise full local authority.⁽³⁾

The economic system of Iraq is strongly influenced by a commitment to socialist principles. Uncontrolled development has a very limited role to play in the national development process. The latter is centrally planned and directed. Since the 1958 Revolution, when the Monarchy was overthrown and a Republic was established, socialist transformation has taken place. Its prospects were influenced significantly by the changes of regime in Iraq on July 1958, February and November 1963. Each had its effect, good or bad, on this transformation.⁽⁴⁾ However the socialist transformations in all institutions of Iraqi society was one of the chief tasks of the revolution of 17th July 1968, lead by Arab-Ba'th socialist party.⁽⁵⁾

- (1) Muhafadah is the largest administrative unit in the country. Also referred to as sub region, governorate or province.
- (2) General Directorate of Surveying, Table of the Administrative Units in the Republic of Iraq, Ministry of Agriculture and Agrarian Reform, Baghdad, January, 1978. Before 1970 the local name given to Muhafadahs was Liwas. Iraq, up to 1968 was divided into 14 Liwas. Later in 1968 two more Liwas were created (D'hok in the North region and Muthana in the South region). In 1976, a further two more Muhafadahs were also created (Salah Al-deen and Najaf Governorates, both in the Central region), bringing the total number to eighteen.
- (3) Granting autonomy to the Iraqi Kurds, as a result of the peace settlement achieved by the leadership of the 1968 revolution, put an end to the Kurdish question which has led to a civil war started in the beginning of 1960's and ended in 1974.
- (4) Ministry of Information, The 1968 Revolution in Iraq-Experience and Prospects, Ithaca Press, London, 1979, PP.75-76.
- (5) Ibid, P.75.

The eight regional conference of the party held in 1974 emphasised that "The Arab Ba'th socialist party...seeks to propagate socialist values and ideology and apply them in practice...The party must apply a programme of socialist transformation..."⁽¹⁾

5.2. Population Growth, Spatial Distribution and Urbanisation Pattern

5.2.1. Population Growth and Structure

The total population of Iraq according to the general censuses conducted in 1947, 1957, 1965 and 1977 were 4815000, 6298976, 8047415 and 12000497 inhabitants respectively (See table (5.1)). Accordingly, the growth of the total population over the past four decades shows that the rate of growth is one of the highest in the world. It has grown at an increasing rate ranging from 2.7% to 3.4% per year, during the period 1947-1977. It increased from 2.72% per annum during the period 1947 - 1957 to 3.1% annually during the period 1957 - 1965, then to 3.38% during the last period, 1965 - 1977.⁽²⁾ This increase is attributed mainly to the combination of a high fertility rate⁽³⁾ and a low death rate. "Fertility rate in mid 1965 was 49.5. During the periods 1965 - 1970 and 1970 - 1975 the corresponding figures were 49.2 and 49.0 respectively. For the same two periods, crude death rates were 16.4 and 14.5 respectively, whereas the crude death rate for mid 1965 was 17.5 per thousand. Life expectation at birth in 1952 was estimated at 40.4 years, and 48.6 years in 1965... it is expected that life expectancy will reach 62 years by the year 1985."⁽⁴⁾

The National Committee of population policies in Iraq believes that the annual population growth rate would be maintained at 3.2% until 1980.⁽⁵⁾

(1) Revolutionary Iraq 1968-1973, the Political Report adopted by the Eighth Regional Congress of the Arab Ba'th Socialist Party-Iraq, January 1974, P.129.

(2) The above growth rates are derived from table 5.1.

(3) Fertility rate simply is the number of births per 1000 women aged 15 to 44. (See A.H.Pollard et.al., Demographic Techniques, Pergamon Press, Oxford, 1981, P.83). This measurement is used in Iraq.

(4) National Committee for Population Policies, Population Growth and Development in Iraq, Ministry of Planning, Baghdad, 1974, PP.4-5.

(5) Ibid

The Long-term Planning Commission of the Ministry of Planning believes that this growth rate may decline slightly afterwards, between 1980 - 1985, because of certain predicted socio-economic changes that would occur in the future and bring down the population growth rates. The Commission argued that, "The expected improvement in the cultural level and the increase in the per capita income would make birth control more widely expected."⁽¹⁾ The Commission suggested the following rates of growth: 3.1% for the period 1980-1985, 3.06% for the period 1985-1990 and 3.03% for the period 1990-1995, bringing the expected population at the end of last period to 19 841 472 inhabitants"⁽²⁾

As in most developing countries, the population structure is strongly biased towards the young. There has been a remarkable increase in the percentage of the population ages less than 14. It was 41.7% in 1947 and increased to 46.3% and 48.9% for the years 1957 and 1965 respectively.⁽³⁾ In 1977 this percentage continued to be 48.9.⁽⁴⁾

The most important feature of population growth in Iraq is its urbanisation pattern. The present process of Iraq's urbanisation is unprecedented in the country's history. Iraq was primarily a rural agricultural country until the 1940's. Since then the country changed into one that is increasingly urban. The total urban population in 1947 were 1353 thousand inhabitants, representing 28.1% of the total Iraqi population. In 1957 urban population reached 2455 thousands, representing 39% of total population. In the 13 years following the 1957, the urban population has doubled and more than tripled by 1977. By 1977 63.7% of Iraqi population were residing in urban areas (See table 5.1)).

(1) Commission of Long-Term Planning, Growth of Iraqi Population for the Period 1970-1990 (In Arabic), Ministry of Planning, Baghdad, 1974, P.2.

(2) Ibid, Table No.(1).

(3) J. Hashim, et.al., Evaluation of Economic Growth in Iraq, 1950-1970, (In Arabic), Ministry of Planning, Baghdad, 1970, P.206.

(4) Extracted from table No.2/3, Annual Abstracts of Statistics, 1978, op.cit., P.27.

Table (5.1) Growth and Distribution of Iraq Population by Environment and Muhafadhs 1947 - 1977

Muhafadah	1947			1957			1965			1970			1977			Total								
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total									
	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)	Number (000's)									
	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%									
Baghdad	508.5	37.6	817.2	17.0	11.9	1313012	20.9	1596706	39.8	4486669	11.4	2045375	25.4	2122298	40.5	348342	2470630	26.8	2570072	58.2	2109760	26.1	1697076	6.2
Erbil	143.1	10.6	225.7	7.6	7.0	502330	8.0	415748	10.1	253731	6.4	669479	8.3	572844	10.9	175972	752526	8.2	800453	10.5	203173	4.8	1169701	4.8
Basrah	182.1	13.5	296.2	12.4	12.6	758447	12.0	358616	8.7	304151	9.8	742767	9.2	428783	8.2	441916	879699	9.5	59812	7.8	50859	11.0	491425	9.1
Al-Qadisiyah	74.6	5.5	211.9	6.1	6.2	398859	6.2	231187	5.6	241679	6.9	473626	5.9	264693	5.1	256024	520717	5.6	317437	4.5	147694	3.4	491425	4.1
Al-Basrah	31.6	2.3	205.2	5.9	5.2	272383	4.3	134151	3.3	222142	5.6	356243	4.4	143642	2.9	252035	401697	4.4	298064	3.8	253202	5.8	541470	4.5
Sulaymaniyah	31.9	2.3	226.4	4.7	4.9	304895	4.8	177132	3.1	272016	6.9	397768	5.0	174928	3.3	293633	458627	5.0	225032	4.2	264795	8.4	69057	5.8
Al-Najaf	20.1	2.2	271.4	5.6	6.6	329135	5.2	135150	3.5	262213	6.7	397163	4.9	171200	3.4	269140	468340	5.1	242054	3.2	343002	7.3	59724	4.9
Al-Karbala	22.0	2.4	193.0	4.9	4.9	254033	4.0	122989	3.0	184023	4.7	307012	3.8	153418	2.9	162121	337206	3.4	259654	3.3	216105	4.8	46059	3.9
Al-Hillah	33.9	2.5	224.9	4.7	5.9	299899	4.7	102220	2.5	251111	5.9	34331	4.2	125913	2.3	214225	337206	3.7	193672	2.4	251463	5.3	415140	3.9
Al-Diwaniyah	41.7	3.1	593.5	3.4	6.4	329840	5.2	104132	2.5	241135	6.1	345467	4.3	127173	2.4	240276	367449	4.0	165782	2.2	205793	4.8	322775	2.1
Al-Kut	57.2	4.2	261.2	6.4	6.5	354779	5.6	164533	4.0	283635	7.2	448169	5.6	208181	4.0	301305	507487	5.5	261182	3.8	26354	7.3	56076	4.1
Al-Karrala	92.6	6.8	274.3	5.7	10.2	217575	8.3	250439	6.1	89415	2.3	339254	4.2	290467	5.5	85374	372841	4.1	170110	2.2	94612	2.3	26962	2.3
Al-Qadisiyah	41.5	3.1	362.5	7.9	10.2	520470	2)	305623	3.2	269529	6.8	400092	5.0	156129	3.0	260525	541889	4.5	139119	2.6	27221	5.2	423066	3.5
Al-Najaf	30.0	2.1	371.9	7.7	9.7	458848	7.3	133317	3.2	365523	9.3	143136	6.2	185634	2.5	359225	155305	2.4	247403	2.2	375276	2.9	61093	5.8
Al-Basrah	30.0	2.1	371.9	7.7	9.7	458848	7.3	133317	3.2	365523	9.3	143136	6.2	185634	2.5	359225	155305	2.4	247403	2.2	375276	2.9	61093	5.8
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Al-Najaf	30.0	2.1	371.9	7.7	9.7	458848	7.3	133317	3.2	365523	9.3	143136	6.2	185634	2.5	359225	155305	2.4	247403	2.2	375276	2.9	61093	5.8
Al-Basrah	30.0	2.1	371.9	7.7	9.7	458848	7.3	133317	3.2	365523	9.3	143136	6.2	185634	2.5	359225	155305	2.4	247403	2.2	375276	2.9	61093	5.8
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Al-Basrah	30.0	2.1	371.9	7.7	9.7	458848	7.3	133317	3.2	365523	9.3	143136	6.2	185634	2.5	359225	155305	2.4	247403	2.2	375276	2.9	61093	5.8
Al-Najaf	30.0	2.1	371.9	7.7	9.7	458848	7.3	133317	3.2	365523	9.3	143136	6.2	185634	2.5	359225	155305	2.4	247403	2.2	375276	2.9	61093	5.8
Al-Basrah	30.0	2.1	371.9	7.7	9.7	458848	7.3	133317																

The slopes of the curves in figure (5.1) confirm this trend and shows that most if not all the growth in Iraqi population goes to the urban areas. This trend is more apparent for the periods 1957 - 1965 and 1965 - 1970. This transformation was only possible because there was a rapid rate of migration from rural to urban areas and a high rate of natural population increase. Migrants on this scale led to a number of problems in rural areas. Among these problems, are shortages of some agricultural crops as a result of the migration of the most productive age groups to urban centres.⁽¹⁾

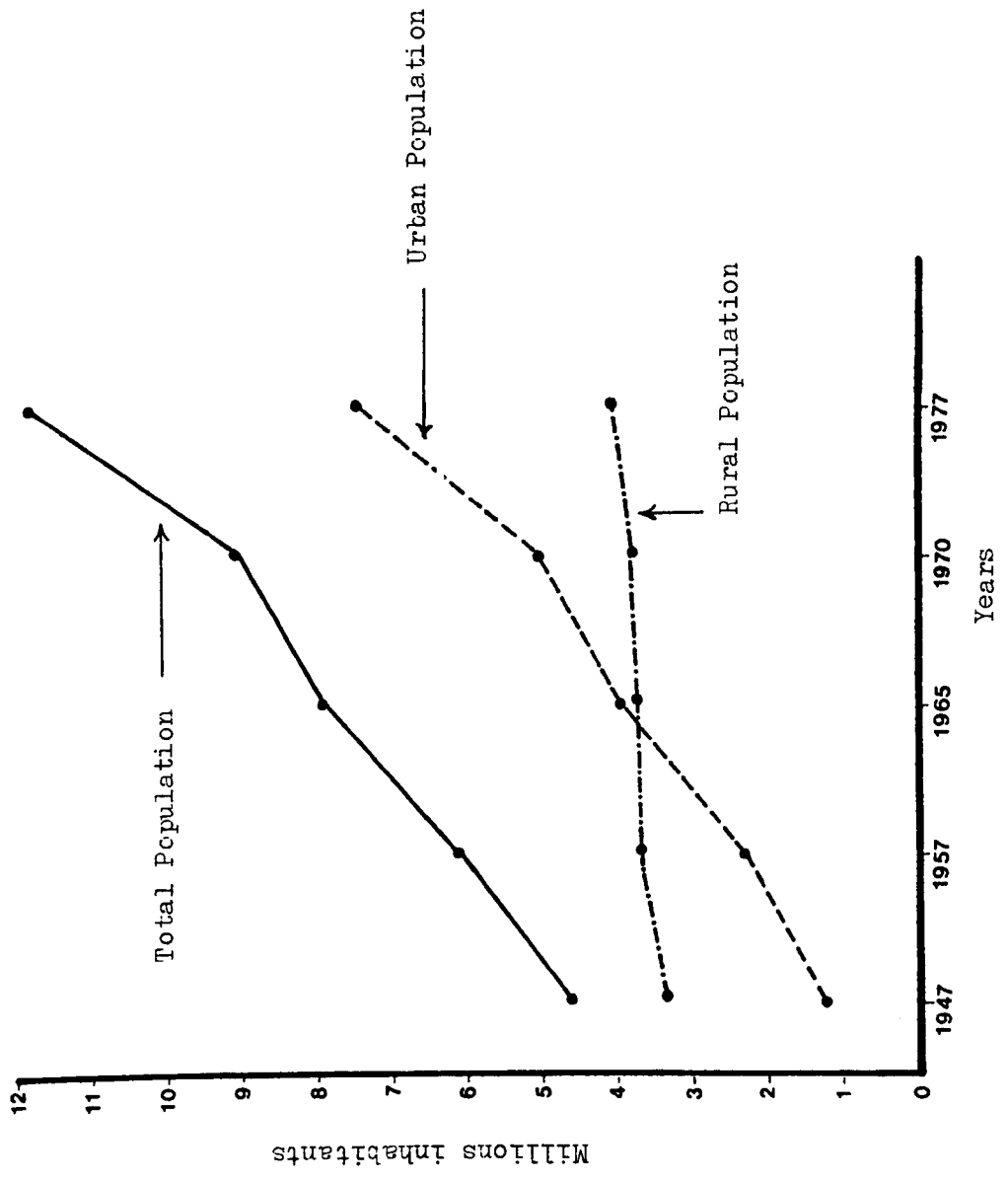
The most urgent problem in the urbanisation process, is not its rate of growth, but rather the pattern of distribution of urban population which is characterised by the predominance of a few metropolitan areas in general, and the overwhelming dominance of the capital city in particular. This aspect will be discussed in some detail in the following section.

5.2.2. Spatial Distribution of Population and Urbanisation Pattern

Distribution of Iraqi population tends to be concentrated in some Muhafadahs rather than others. This trend has intensified over the past four decades (See table (5.1)). Of the 4815.2 thousand inhabitants in 1947, the national capital Baghdad, was the most heavily populated of the Muhafadahs, with about 17% of the total population. Ninevah Muhafadah came in the second place with 12.4% of the total. Qadisiya, Thi-Qar and Basrah Muhafadahs came next, with 7.9%, 7.7% and 7.6% of the

(1) W. A. Hilmi, Internal Migration and Regional Policy in Iraq, Unpublished Ph.D. Thesis, University of Sheffield, Town and Regional Planning Department, Vol.1, 1978, P.XXIV.

Figure (5.1)
Total and Urban Population Growth for the Years
1947, 1957, 1965, 1970 and 1977



total respectively. However, the lifetime migration estimates⁽¹⁾ showed that there were only three gaining Muhafadahs in 1947, namely Baghdad which gained 125334 migrants, Basrah, the sea port, which gained 46,486 migrants and Kirkuk (recently Ta'mem), the centre of the oil fields, which attracted a mere 380 net migrants (See table (5.2)). By 1957, the relative importance of Baghdad had increased. Its share of total population increased to 20.9%. Basrah had moved up to third place. Thi-Qar and Ta'mem Muhafadahs came next. Again the lifetime migration estimation shows that all Muhafadahs except Baghdad, Basrah and Ta'mem continued to experience a net loss in migration. Particularly significantly, the net in-migration to Baghdad by 1957 was 304,908 migrants, more than double of that of 1947. Basrah attracted about 20,000 migrants. The most significant increase, in relative terms, was experienced by Ta'mem governorate. It attracted 8434 net in-migrants, that is, more than 22 times the number of the net gain of that in 1947. In 1965, the total population of Baghdad increased to more than two millions, constituting one-quarter of the population of the whole country, with an annual rate of growth of 5.5%, which is almost double the national growth rate. In the next place came Ninevah, Basrah, Thi-Qar and Ta'mem with 9.2%, 8.3%, 6.2% and 5.9% of the total population respectively.⁽²⁾ Hence, by

(1) Lifetime migration estimates based on the idea that..."a person whose area of residence at the census or survey date differs from his area of birth is a lifetime migrant. The number of such persons in a population is commonly referred to as "lifetime migration"! (See, U.N., Methods of Measuring Internal Migration, Population Studies, No.47, Department of Economic and Social Affairs, New York, 1970, P.2). This number, is however, a gross understatement of both the amount of migration that has occurred during the lifetime of the living population and of the number of persons who have migrated. It excludes all moves that intervened between departure from the area of birth and arrived in the area of residence as reported at the census date, and it does not count as migrants persons who moved away from and subsequently returned to their areas of birth. Furthermore, it necessarily takes no account of the migration of persons who died before the census date. (Ibid, P.2).

(2) The main reason to the relatively high decline in the share of both Ninevah and Qadisiya Muhafadahs due mainly to the fact that, the 1965 census results which were published in 1973, has calculated the population of both newly created Muhafadahs of D'hok and Muthana separately from their original Muhafadahs of Ninevah and Qadisiya respectively.

1965, 55% of the total population was concentrated in the above five Muhafadahs. Baghdad, Basrah and Ta'mem continued to experience a net gain in population. Out of 732,363 inhabitants, the total increase of Baghdad's population in 1965, 540,294 inhabitants was due to internal migration. Basrah gained 38925 inhabitants and Ta'mem gained 33894 inhabitants from internal migration. The last general population census of 1977 shows that still 26.6% of Iraqi population was concentrated in Baghdad.⁽¹⁾ Sulaimaniya Muhafadah moved up to fourth place with 5.8% of the total population. The decrease in the population share of Ta'mem Muhafadah from 5.9% in 1965 to 4.1% in 1977 due to the reduction of its boundaries and incorporating some of its parts into other Muhafadahs, especially the newly created Muhafadah of Salah Al-Deen and Sulaimaniya Muhafadah. The last census results, showed that for the first time since 1947, Muhafadahs other than the traditional ones have experienced net population gains. They are Sulaimaniya, Arbil and Kerebla Muhafadahs. The net gain of Sulaimaniya was 44187 inhabitants while that of Arbil was 22303 inhabitants and Kerebla 6567 inhabitants. However, Baghdad took the lead and gained 725 013 inhabitants, coming in the next place Basrah with 85 840 inhabitants and Ta'mem 38213 inhabitants. Maysan, Thi-Qar, Diala, Ninevah and Wasit experienced the highest net loss. They lost 271 398, 136 275, 118 851, 100 415 and 97 458 inhabitants respectively. (See Table (5.2)).

(1) The share of Baghdad population did not decline despite the creation of Salah-Al-Deen Muhafadah which were mainly taken from Baghdad Muhafadah.

Table (5.2)
Number of In-Out and Net Lifetime Mig rants by Governorates in Iraq: 1947, 1957,
1965, 1973 and 1977

Muhafathas	1947			1957			1965			1973			1977		
	In	Out	Net	In	Out	Net	In	Out	Net	In	Out	Net	In	Out	Net
Anbar	12838	17016	-4178	15964	29325	-13361	17891	97180	-79289	4700	76100	-71400	36840	70274	-33434
Arbil	9898	11437	-1539	10520	18896	-8376	35817	37857	-2040	21700	16500	+ 5200	60903	38600	+22303
Babylon	14842	31170	-16328	17742	51255	-33513	19886	53031	-33145	107100	57900	+49200	66424	99140	-32716
Baghdad	172496	47162	125334	346967	42059	304908	591577	51283	540294	766800	81800	+685000	868091	143078	+725013
Basrah	58141	11655	46486	81241	15711	65530	68059	29134	38925	71600	36300	+35300	138587	52747	+85840
Diok	10248	28391	-18143	16329	50632	-34303	12716	61072	-48356	18700	23000	-4300	39109	40549	-1440
Diala	21917	26038	-4121	15176	44965	-29789	22682	71749	-49067	43400	113100	-69700	47555	166406	-118551
Kerebla	15678	18212	-2534	24155	27991	-3836	10679	43324	-32645	70900	76000	- 5100	42778	36211	+6567
Kirkuk (recently Ta'men)	21626	21246	380	32024	23590	8439	71264	37370	33894	15600	57700	-42100	100882	62669	+38213
Majsan	10566	105439	-94873	9020	191747	-182727	10316	174966	-164650	6600	2184000	-211800	16627	288025	-271398
Muthana	4885	8804	-3919	8715	14729	-6014	4751	19846	-15095	1800	10500	-8700	12187	27962	-15775
Ninevah	29826	32369	-2543	45816	51514	-5698	47826	87413	-39587	33900	82300	-48400	42113	142528	-100415
Qadisiya	18425	23322	-4897	23825	34120	-10295	25128	61071	-35943	28800	167600	-138800	40108	124551	-84443
Sulaimaniya	8349	9604	-1255	12954	14580	-1626	44995	54461	-9466	7600	17400	-9800	74317	30130	+44177
Thi-Qar	8569	25831	-17262	9758	487768	-39190	19465	78169	-59704	4100	104600	-100500	17137	153412	-136275
Wasit	28057	28665	-608	40036	50180	-10144	25561	70687	-45126	28800	73900	-45100	42322	139780	-97458
Hajaf											19000		44078	63814	-19736
Salah-Aldeen													31305	41487	-10182
Total	446361	446361	0	710062	710062	0	1028613	1028613	0	1232100	1232100	19000	1721363	1721363	0

Sources: (1) M.E. Elattar, and T. Albander, Internal Migration in Iraq: An Explanatory Study, Ministry of Planning, Department of Regional Planning, Baghdad, 1975, Table 3.

(2) The year 1973 is taken from M.M. Al-Rawi, Tackling the Problem of Rural-Urban Migration and especially slum dwellers Problem, (In Arabic) Ministry of Planning, Department of Regional Planning, Baghdad, 1975, Table No. 2, P.5.

(3) The year 1977 is taken from the Results of 1977 Population Census.

Note: For 1973 computation balance of Net Migration is not equal to zero. This imbalance seems to be the result of estimating migration outside Iraq as 19000 migrants without considering immigration to Iraq.

The application of Hoover index of population dispersion⁽¹⁾, best illustrate the continuing and increased trend of population concentration in Iraq. In general, the index is high and is highly

(1) Hoover index of population dispersion is given by:

$$H_t = \frac{1}{2} \sum_i^k \left| \frac{P_{it}}{a_i} - a_i \right| 100,$$

where:

P_{it} refers to the proportion of a country's population residing in area i at time t ;

a_i refers to the proportion of that nation's area taken up by sub area i .

The index varies from 0 to 100, or from a reading of perfectly uniformly distributed population to perfect concentration (See, P.Gorden, "Decentralisation without a 'clean-break'", Environment and Planning, Vol.11, 1979, PP.281-290.

In extracting the index, population percentages of Muhafadahs are taken from table (5.2), while the percentages of Muhafadah's area are as follows:

Muhafadah	years		
	1947-1965	1970	1977
Baghdad	5.1	5.1	1.2
Basrah	4.1	4.1	4.4
Ninevah	11.0	8.7	8.2
Ta'mem	4.5	4.5	2.2
Arbil	3.5	3.5	3.3
Sulaimaniya	2.7	2.7	3.6
Diala	3.6	3.6	4.4
Anbar	31.5	31.5	19.1
Wasit	3.4	3.4	3.9
Maysan	4.1	4.1	3.2
Babylon	1.6	1.6	1.2
Kerebla	1.6	1.6	13.2
Qadisiya	19.0	2.1	1.9
Thi-Qar	3.3	3.3	3.1
Muthana	-	16.9	11.2
D'hok	-	2.3	2.0
Salah Al-Deen	-	-	6.6
Najaf	-	-	6.3
Others	1.0	1.0	1.0
Total	100.0	100.0	100.0

Source, Central Statistical Organisation, Annual Abstracts of Statistics for the years 1968, 1970 and 1977, Ministry of Planning, Baghdad, 1968, 1970 and 1977.

deviated from the hypothesised uniform distribution. The index was 39.1% in 1947 and decreased slightly to 38.7 in 1957. Since then it increased remarkably to 40.4 in 1965, 43.9 in 1970 (the highest concentration pattern). Finally, a slight drop was experienced by 1977, where the index decreased to 43.2.

The phenomenon of urban population concentration is even more apparent. Table (5.1) shows that in 1947, out of 1353 thousand urban inhabitants, 37.6% was concentrated in Baghdad. A further 36.4% lived in three major Muhafadahs urban areas (Ninevah, Basrah, Ta'mem) in addition to Kerebla Muhafadah. The remaining 24% were distributed among the urban areas of the other nine Muhafadahs. By 1965, the total urban population in Iraq had grown to 4112 291 inhabitants. The percentage of urban population living in Baghdad increased to 38.8%. Ninevah, Basrah, Ta'mem and Kerebla urban areas together accounted for 30.5% of the total urban population, bringing the total urban population living in five Muhafadahs to 69.3%. The remaining 30.7% of the urban population were distributed among the remaining urban areas of the other eleven Muhafadahs. By 1977, 38.2% of the total urban population were residing in Baghdad. Ninevah, Basrah, and Ta'mem together accounted for 22.8% of the total urban population, bringing the total urban population living in the four major Muhafadahs to 61%. The remaining 39% of the urban population were distributed among the remaining urban areas of the other fourteen Muhafadahs. Accordingly, although the trend for concentration of urban population in a few Muhafadah's urban areas continued, especially the trend toward the dominance of Baghdad, there seems to be a sign of redistribution of urban population so as to create a more reasonable urban hierarchy. The huge trend of urban population concentration and the signs of redistribution could be seen clearly through the application of Hoover index of population dispersion. The results show that the index is even higher than that of the distribution of

population. It was 50 in 1947 and decreased to 45.5 in 1957. It increased to 47.6 and 50.3 in 1965 and 1970 respectively. The index shows a slight decline by 1977, giving a value of 49.4.⁽¹⁾

Urbanisation problems are not only represented by a considerable urban population concentrated in few major Muhafadahs, but that, on the one hand, almost more than one third of the urban population are concentrated in one city, that is, Baghdad City. Its share of the total urban population has increased since 1957. It contained 32.7% of the total urban population in 1957 which increased to 36.3%, 36.7% and 37.5% in 1965, 1970 and 1977 respectively. Accordingly, the period 1957 - 1965 experienced the highest migration level to Baghdad City. On the other hand, more than 50% of the total urban population are concentrated in four major cities of Baghdad, Basrah, Mosul (administrative centre of Ninevah Muhafadah) and Kirkuk (administrative centre of Ta'mem Muhafadah). 51.6% of the total urban population were concentrated in these four urban centres in 1957. They contained 54.5%, 52.6% and 53.0% of the total in 1965, 1970 and 1977 respectively. Again the figures indicate that the highest migration rate to these major urban centres occurred in the period 1957-1965.

Such an urbanisation pattern brings into existence three main characteristics of the city-size distribution in Iraq. The first characteristic is the existence of the major primate city, the second is the increasing dominance of the primate city over time and the third is the wide deviation of the existing pattern of city-size distribution

(1) The same formula and tables used in the calculation of the total population index are used again here to extract the urban population distribution index.

from the hypothetical pattern suggested by Zipf⁽¹⁾ The size of the second largest city in 1957 (Mosul) was less than quarter the size of the largest city (Baghdad). The relative size of the second urban centre decreased from 22.2% (compared to the size of the largest city) in 1957 to 20.8% in 1965 (Basrah city moved up to the second place in 1965), 17.2% in 1970 and to only 15.7% in 1977 (See table (5.3)).

The distribution pattern of the city-size for different periods shows not only a wide deviation from the hypothetical pattern, but also that the deviation is widening (See figure (5.2)). In 1957, the actual size of the first ten cities in Iraq was closer to the hypothetical pattern than that of 1965, 1970 and 1977. The deviation was greatest in 1977.

(1) As it has been seen in Section 3.2, Zipf's rank size rule suggests that the hypothetical pattern of city-size distribution is expressed in the following formula;

$Pr = \frac{P_1}{r}$ where Pr = population of the rank r settlement,

P_1 = population of the largest city, and

r = rank of the settlement.

Accordingly, the size of cities below the largest city should be $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$ etc. for the second, third and fourth settlements respectively,

and so on for other settlements.

Berry, among other scholars, believes that the rank-size rule is a satisfactory tool for the analysis of urbanisation on both national and regional levels (See Brian J.L.Berry and Frank E.Horton, Geographic Perspectives on Urban System, Prentic-Hall Inc., Englewood Cliffs, New Jersey, 1970, P.79). It indicates that an integrated national system of cities prevails (Ibid, P.64). "It makes an ideally balanced structure of the urban network, without almost any influence of strongly deforming forces." (Ibid, P.79).

As it has been seen in Section (3.2), it is an empirically established rule. It appears to be valid throughout many parts of the world. Although some scholars may have restrictions about applying the rule to regions, it has been applied among other places, in Poland to measure the efficiency of the urban hierarchy, in 1960, on both national and regional levels (Ibid, PP.80-81). In Iraq, Al-Rawi used the rule when analysing the urban size distribution in Wasit and Al-Qadissiya Muhafudahs (See M.M.Al-Rawi, A Spatial Analysis of the provision of Services in the Wasit and Al-Qadissiya Governorates (Iraq), Unpublished Ph.D. thesis, University of Manchester, 1978, PP.101-106). Hence, the rank-size rule is used in this study to analyse the urbanisation pattern in Iraq in this chapter, the urbanisation of the Upper Euphrates Region in the following chapter and when analysing the alternative proposed urban growth strategies for the region in Chapter nine.

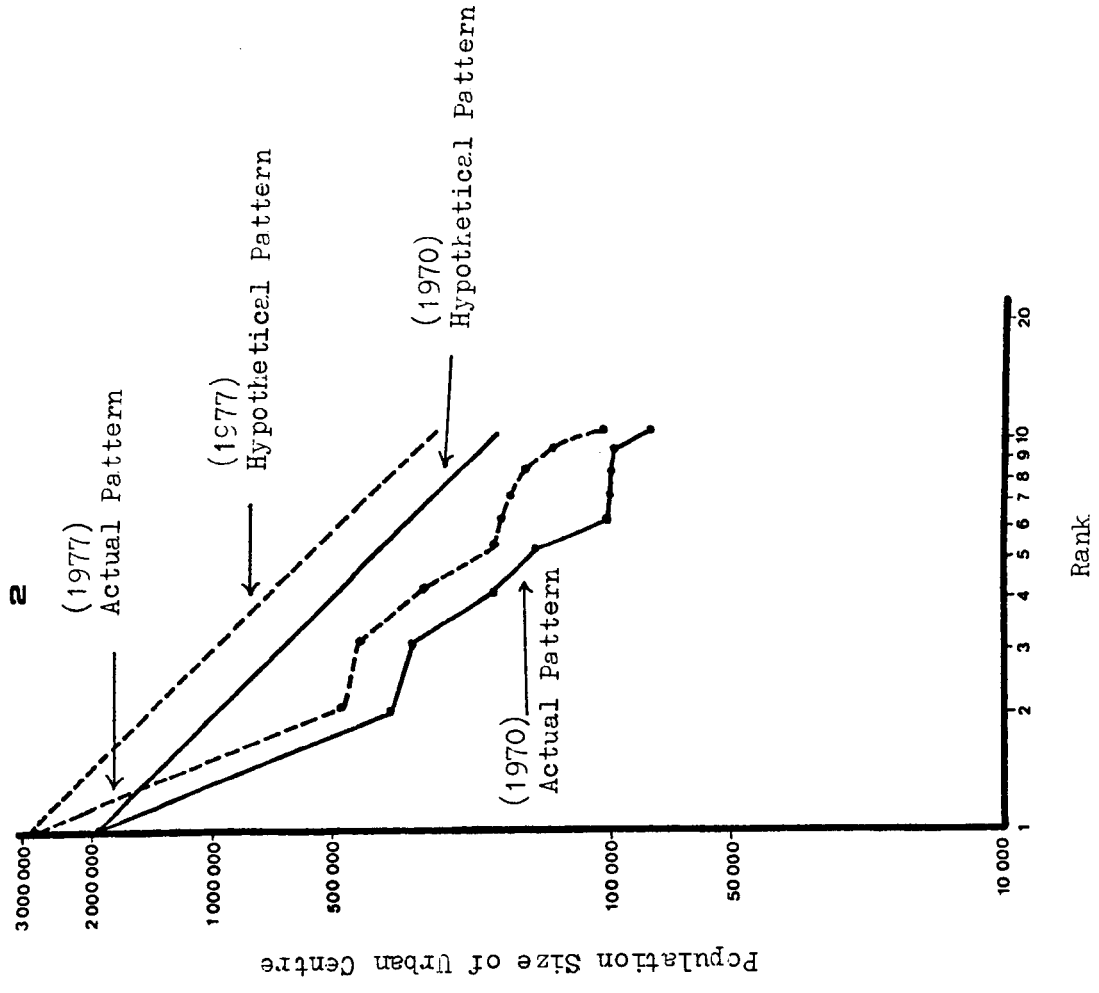
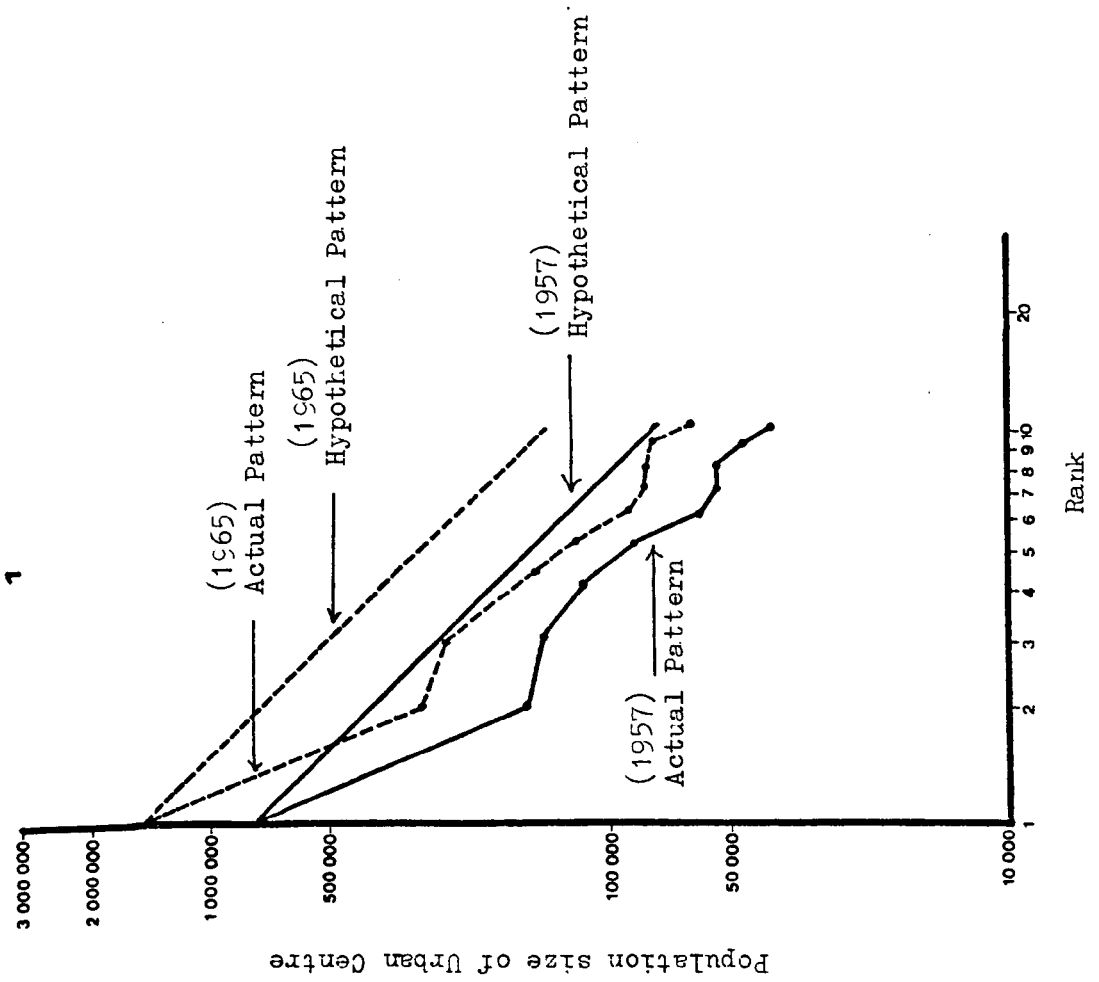
Table (5.3)
 Size of the First Ten Cities in the Hierarchy of Iraqi Urban Areas for the Years
 1957, 1965, 1970 and 1977

City	1957					1965					1970					1977				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
	Actual No. of Population	% of the Largest City	Rank	No. of Population According to Zipf Rank-size Rule	% of the Largest City	Actual No. of Population	% of the Largest City	Rank	No. of Population According to Zipf Rank-size Rule	% of the Largest City	Actual No. of Population	% of the Largest City	Rank	No. of Population According to Zipf Rank-size Rule	% of the Largest City	Actual No. of Population	% of the Largest City	Rank	No. of Population According to Zipf Rank-size Rule	% of the Largest City
Baghdad	80,017	100.0	1	80,017	100.0	14,925,900	100.0	1	14,925,900	100.0	1,927,901	100.0	1	1,927,901	100.0	2,865,925	100.0	1	2,865,925	100.0
Basrah	164,705	20.5	3	268,006	33.3	3,109,500	20.8	2	7,462,950	50.0	3,316,884	17.2	2	9,639,951	50.0	4,511,102	15.7	2	14,320,962	50.0
Beirut	176,222	22.2	2	402,009	50.0	2,641,146	17.7	3	4,975,300	33.3	3,103,113	16.1	3	6,426,340	33.3	4,298,983	15.0	3	9,553,308	33.3
Kirkuk	120,102	15.0	4	201,004	25.0	1,753,303	11.7	4	3,731,148	25.0	1,911,194	9.9	4	4,819,750	10.7	3,074,663	10.7	4	7,164,481	25.0
Arbil	30,343	5.0	10	20,401	10.0	908,956	6.1	6	2,487,650	16.7	1,017,779	5.3	6	2,409,988	12.5	1,935,558	6.8	5	5,731,195	20.0
Hajaf	20,100	11.1	5	1,608,003	20.0	1,340,227	9.0	5	2,995,118	20.0	1,478,555	7.7	5	3,855,980	20.0	1,864,479	6.5	6	4,776,654	16.7
Sulaymaniyah	49,512	6.1	9	893,335	11.1	836,412	5.6	8	1,865,574	12.5	1,030,910	5.3	7	2,754,114	14.3	1,754,413	6.1	7	4,024,119	14.3
Hilla	51,253	6.8	7	1,148,660	14.3	841,104	5.6	7	2,132,227	14.3	1,035,544	5.4	6	3,213,117	16.7	1,610,566	5.6	8	3,592,241	12.5
Erbil	60,491	7.5	6	1,340,003	16.7	815,539	5.5	9	1,650,443	11.1	961,999	5.0	9	2,142,111	11.1	1,397,990	4.9	9	3,181,156	11.1
Wasit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,131,183	3.9	10	2,869,953	10.0
Amara	5,352	6.7	8	1,007,002	12.5	646,674	4.3	10	14,925,900	10.0	81,327	4.2	10	1,927,900	10.0	-	-	-	-	-
Total	1,613,627			23,442,440		278,1931			437,1749		3,394,887			5,646,761		5,083,052			12,374,203	

Source: the same as in Table (5.1).

Figure (5.2)

The Top Ten City-Size Distribution in Iraq
For the Years 1957, 1965, 1970 and 1977



As a result of the dominance of the primate city over the hierarchy of urban centres in Iraq and the concentration of more than half of the urban population in four major urban centres, the resulting overall urban hierarchy does not correspond to the general well known trend that all city size distributions are strongly positively skewed to the right, i.e. that there are many small but only a few very large cities with a tendency for the number of cities in each size class to decline as city-size increases. Details in table (5.4) shows clearly the absence of such a tendency. It shows that only one city had a population over one million, without any city in next urban size group in either 1965 or 1977. In some successive urban size groups the number of urban centres are the same. This is applied to urban size groups (3) and (4) in 1965, each with two urban centres and urban size groups (4) and (5) in 1977, each with 8 urban centres. Figure (5.3), also shows that in the lower tail of distribution curves, where such a tendency prevails, the number of urban centres in different size groups is not proportional. This is very clear in case of groups number 6 and 7. and 8 and 9 in 1965 and groups 8 and 9 in 1977.

Last, but not least, although population distribution pattern and location of urban areas in Iraq were and still, to a large extent, are the products of country's physiographic setting⁽¹⁾ and its urban history, as it will be found later on, the socio-economic development policies strengthened such a pattern.

5.3. Sectoral and Spatial Economic Development in Iraq

Most of the economic studies about Iraq which have been carried out on macro level, have discussed the structure and development of Iraqi economy in detail. Here we are not going to the same detail as the prime aim is to study urbanisation strategy on a regional level. Nevertheless, emphasis will be given to the analysis of spatial development aspects of the economy, since they are an important factor influencing urbanisation

(1) The two prominent features of the physiography of Iraq are the twin rivers Tigris and Euphrates and the desert.

Figure (5.3)

Distribution of Urban Areas by Sizes Groups
for 1965 and 1977

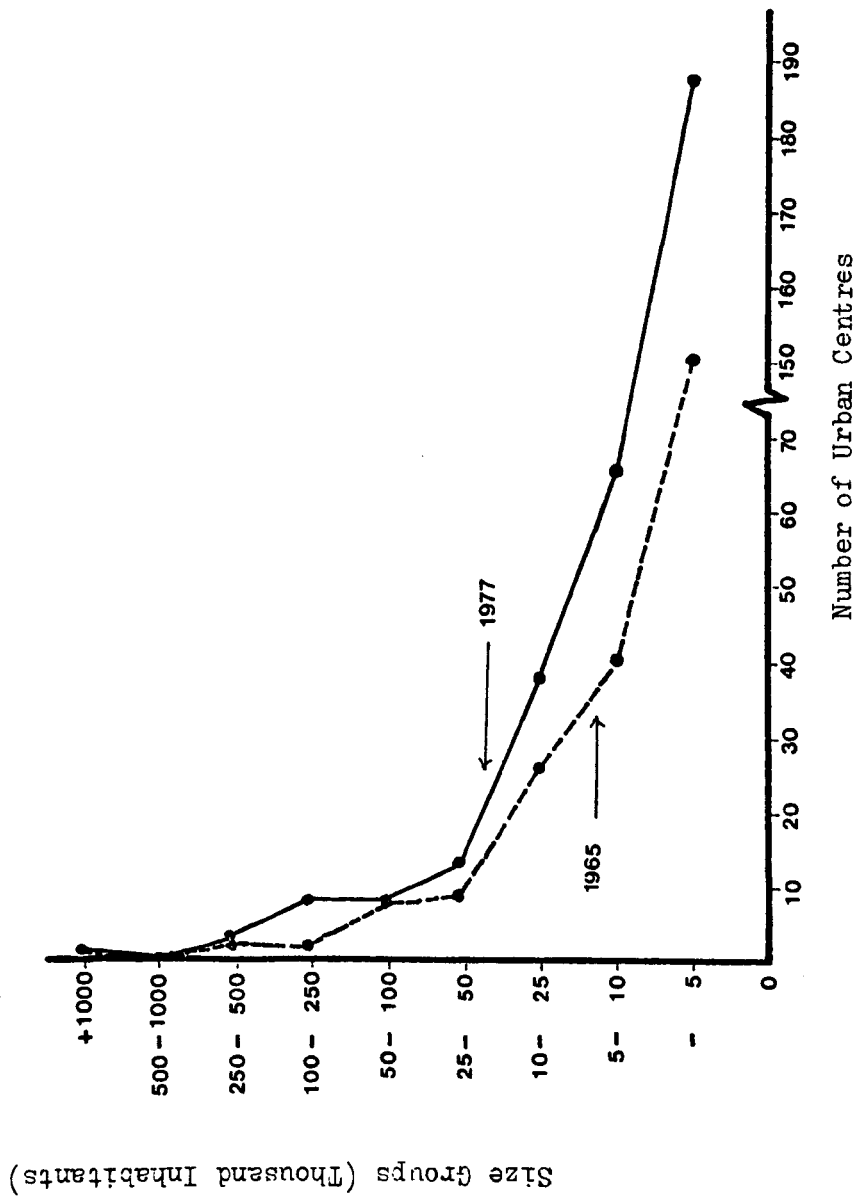


Table (5.4)

Number of Cities by Urban Size Groups
for 1965 and 1977

Urban Size Groups	Rank of the Group	1965				1977			
		No. of Cities	%	Total Population	%	No. of Cities	%	Total Population	%
-5000	9	150	63.3	268825	6.5	187	57.9	351392	4.6
5001-10000	8	40	16.9	276206	6.7	65	20.1	487495	6.4
10001-25000	7	26	11.0	356998	8.7	38	11.8	645869	8.4
25001-50000	6	9	3.8	308515	7.5	13	4.0	455325	6.0
50001-100000	5	7	3.0	524731	12.8	8	2.5	534512	7.0
100001-250000	4	2	0.8	309330	7.5	8	2.5	1117088	14.6
250001-500000	3	2	0.8	575096	14.0	3	0.9	1188448	15.5
500001-1000000	2	-	-	-	-	-	-	-	-
more than one million	1	1	0.4	1492590	36.3	1	0.3	2865925	37.5
Total		237	100	4112291	100	323	100	7646054	100

Sources, the same as in table (5.1).

pattern and distribution of urban centres in space.

5.3.1. Growth of National Income and Per Capita Income

The last three decades experienced a high rate of growth of the national income, gross national product and per capita income. Their growth intensified through the last ten years. This increase could be shown both at current prices and at constant prices. The latter measurement reflect the real increase since it takes inflation rate into consideration. However both indications will be presented here for the purpose of comparison. Data on the growth of gross national product (G.N.P.), National Income and per capita income are given in table (5.5).

The national income of Iraq has increased during the period 1964 - 1978 from about 595 million I.D.⁽¹⁾ to 6340 million I.D. at current prices, that is, the growth rate was on the order of about 6.9% per annum. The period 1973 - 1978 has shown a highest average rate of growth (about 76.9% per annum), compared to 7.2% per annum for the period 1964 - 1967 and 11% per annum for the period 1967 - 1972. The very high rate of growth of national income since 1972 was due mainly to the nationalisation of oil in June 1972, which means that all the oil revenue belongs to Iraq.⁽²⁾ At constant prices of 1969 the national income has shown also remarkable increase from about 647 million I.D. in 1964 to about 1364 million I.D. in 1974, that is, the rate of growth was on order of about 10% per annum. The annual average rate of growth was increasing from 4.6% per annum for the period 1964 - 1967 to about 7.4% per annum for the period 1967 - 1972 to 17.4% per annum for the period 1972 - 1974.

Similarly, the G.N.P. also increased from about 646 million I.D. in 1964 to about 6868 million I.D. in 1978, at a current prices and from 703 million I.D. to 1447 million I.D. for the period 1964 - 1974 at 1969 constant prices. The average annual rate of growth was almost the same as that of national income at both current and 1969 constant prices (table (5.5)).

As a result of the growth of national income, the per capita income also increased from about 76 I.D. in 1964 to about 530.5 I.D. in 1978, at current prices and from about 83 I.D. to 126 I.D. in 1974, at 1969 constant prices. The national development plan, 1976 - 1980, aimed at raising the per capita income to about 575 I.D. by 1980.⁽³⁾ The average annual

(1) I.D. is an abbreviation of "Iraqi Dinar". It is the unit of currency in Iraq. It is equivalent to around 1.785 English Pounds (October 1981 exchange rate). The Iraqi Dinar is further broken down into 1000 fils.

(2) Iraq has nationalised the oil operating companies (Iraq Petroleum Company - I.P.C. - and Basrah Petroleum Company - B.P.C. - in June 1972 and March 1973 respectively, i.e., the nationalisation process was undertaken in two stages started in June 1972 and ended by March 1973.

(3) Economic Department, National Development Plan, 1976 - 1980, (In Arabic) Ministry of Planning, Baghdad, 1977, P.8.

Changes in Gross National Product, National Income and Per Capita Income (1964 - 1978)

Year	G.N.P. (Million I.D.)		National Income (Million I.D.)		Per Capita Income (I.D.)		Annual Rate of Growth					
	Current Prices	1969 Constant Prices	Current Prices	1969 Constant Prices	Current Prices	1969 Constant Prices	G.N.P.		N.I.		P.C.I.	
							Current Prices	1969 Constant Prices	Current Prices	1969 Constant Prices	Current Prices	1969 Constant Prices
1964	645.7	702.7	595.1	647.2	75.8	82.5	7.2	4.6	7.2	4.6	3.6	1.2
1965	705.7	766.3	652.2	707.7	80.5	87.4						
1966	767.2	807.1	709.5	746.3	84.9	89.3						
1967*	784.9	798.7	724.0	737.3	83.9	85.4						
1968	871.1	877.5	805.9	812.2	90.4	91.1						
1969	907.5	907.5	837.6	837.6	91.0	91.0	11.0	7.3	11.3	7.4	6.7	3.4
1970	986.4	949.4	912.0	878.8	96.0	92.5						
1971	1128.8	1005.4	1050.0	931.1	107.0	94.9						
1972	1218.2	1090.3	1132.8	1012.0	111.8	99.8						
1973	1467.8	1264.7	1374.4	1181.2	131.2	125.3						
1974	3105.7	1446.8	3002.5	1364.2	277.3	126.0						
1975	3904.0	N.A.	3491.9	N.A.	312.2	N.A.	76.9	-	76.6	-	62.4	13.1
1976	5113.8	N.A.	4826.1	N.A.	417.2	N.A.						
1977+	5593.4	N.A.	5386.2	N.A.	442.5	N.A.						
1978+	6838.2	N.A.	6339.7	N.A.	530.5	N.A.						

+ Provisional N.A. = not available.

Sources, The years 1964-1974 from Economic Department, Economic Indicators of Economic Development in Iraq, Ministry of Planning, Baghdad, 1976, P.8.

* The years 1975-1978 from Central Statistical Organisation, Annual Abstract of Statistics, 1978, op.cit., P.133.
* the reduction in most of the above values due mainly to 1967 war and the subsequent temporary stoppage of oil shipments.

growth was on the order of about 4.3% per annum at current prices and about 5.3% per annum at 1969 constant prices. Again the period after 1972 showed the highest annual rate of growth of about 6.2% per annum in current prices and 1.3% per annum at constant prices (see table (5.5)). Accordingly, the national development plan target is expected to be achieved. Such continuous increments in per capita income, at constant prices, simply means rising the standard of the living of population significantly since 1972. However, there is a belief that "The level of per capita income is....below its potential maximum...."⁽¹⁾, which could be interpreted that with the recent more sound economic policy, the per capita income could be further raised.

Although data on spatial distribution of national income and per capita income are absent, the very scarce studies concerning this aspect, show that it has been less ubiquitous. Economic growth has had a very different impact on rural and urban areas. Economic expansion has taken place mainly in the urbanised areas of the country where average per capita reached 120 I.D. to 150 I.D. in the large cities in 1969, compared to 40 I.D. in rural areas.⁽²⁾ However, the recent national development plan, 1976-1980, gives the issue of reducing regional disparities great importance. Reducing the gap between different regions of the country, in general, and between the urban and rural areas, in particular, was one of its main objectives.⁽³⁾

5.3.2. The Relative Importance of the Economic Sectors

The rapid growth in the G.N.P. could easily be attributed to the dynamic role played by the oil sector. It has always been the most

(1) W.A.Al-Ali, Optimal Inter-Regional Allocation Dynamic Model of Economic Resources for the Iraqi Economy, Unpublished Ph.D. Dissertation, the University of Wales, Aberystwyth, 1975, P.22.

(2) A.K.Hirmis, Industrial Location and Regional Industrial Growth in Iraq, Unpublished Ph.D. Thesis, University of Manchester, Centre for Urban and Regional Research, 1979, PP.11-12.

(3) Economic Department, National Development Plan, 1976-1980, op.cit. P.82.

dynamic sector in the economy. This is due to increases in both prices and production of oil and above all to the nationalisation of foreign oil companies. Table (5.6) shows that during the period 1954-1970, oil has, on average, formed slightly more than 30% of G.N.P. It dropped slightly to about 29% in 1972, the year of oil nationalisation in Iraq. After the completion of nationalisation of all oil operating companies in Iraq in 1973, the importance of the oil sector has grown rapidly and it has formed well over 50% of G.N.P. Till 1972, the oil sector was followed by agriculture with about 19%. The contribution of the agriculture sector to G.N.P. has decreased from about 22.6% in 1954 to 19.4% in 1972. The manufacturing contribution has grown from 5.8% to 10.1% of G.N.P. This increase in the percentage share of the manufacturing sector, reflects the importance given to it in the development strategy of Iraq during this period. However, the relative importance of both agricultural and industrial sectors has declined since 1972, due to the growing importance of oil revenues in absolute and relative terms, which reached to about 60% and 54% of total G.N.P. in 1974 and 1976 respectively.⁽¹⁾ The relative decline in the contribution of the agriculture sector was twice as that of the manufacturing sector. Other sectors, such as, construction, transportation, communication, etc., have been gaining an increasing share due mainly to the expansion in the socialist sectors of administrations and services.

Data available on the structure of the Iraqi economy after 1976 are on a different basis. They do not give the above sectoral details. Instead, the Iraqi economy is divided into three macro economic sectors, that is, the

(1) As a result of the very rapid increase in oil revenue, it played a crucial role in financing the government's ordinary budget and development programmes. The oil revenue, for instance, provides about 91.5% of the total financial requirement of development programmes for the period 1954-1976. (See S.B.Abdul Allah, and I.H.Al.Wa'ith, Statistical Relationships Between Planned Allocations and Actual Investments, Ministry of Planning, Economic Department, 1978, Table No.5, P.11.

Table (5.6)

Relative Distribution of Gross National Product by Economic Sectors During the Years
1954-1976, at current prices

	1954 %	1964 %	1969 %	1970 %	1972 %	1974 %	1976 %
Agriculture, Forestry and Fishery	22.6	19.5	17.2	17.2	19.4	8.0	7.6
Crude Oil	39.9	35.1	30.3	30.1	28.8	60.0)	54.0
Other Mining and Quarrying	0.2	0.2	0.6	0.7	0.5	0.4)	
Manufacturing	5.8	8.3	9.3	9.6	10.1	4.7	7.1
Construction	4.6	2.5	3.5	3.4	3.2	3.6	7.7
Electricity, Water and Gas	0.5	1.0	1.5	1.5	1.0	0.4	0.5
Transport, Communication and Storage	5.9	7.2	6.2	5.9	6.2	2.8)	
Wholesale and Retail Trade	5.5	5.8	8.1	8.2	7.4	4.4)	
Banking, Insurance and Real Estate	1.0	1.0	1.4	1.5	1.4	1.3)	12.7
Ownership of Dwellings	3.2	1.9	4.0	4.2	4.1	1.7)	
Public Administration	5.5	10.7	10.6	10.3	9.8	8.0)	10.4
Services	5.1	6.7	7.2	7.2	8.1	4.7)	
Gross Domestic Product at Factor Cost	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source, A.K. Hirmis, op.cit., table 1-1.

Note

As far as the period 1964-76 is concerned, the following remarks should be made:

- (a) Oil refining: The activity of oil distribution from refineries was excluded, and added to the wholesale and retail trade sector.
- (b) Electricity and Water sector does not include Gas, which was left within the oil refining in the manufacturing industries.
- (c) Wholesale and Retail Trade sector includes restaurants and hotels activities and the like and distribution of oil products also.

commodity, distribution and services sectors. According to this classification, table (5.7) shows that the commodity sectors, that is, agriculture, mining and oil and manufacturing continued to contribute by about 75.5% and 76.6% of total G.N.P. in 1977 and 1978 respectively. (1) However, the national development plan, 1976-1980 aiming at changing the structure of the Iraqi economy toward increasing the role of the agricultural and manufacturing sectors, and reducing the contribution of the oil sector by the end of 1980 to 50.6% of G.N.P. (2) Again, this could

Table (5.7)

Relative Distribution of G.N.P. by Macro Economic Sectors
for the years 1977 and 1978, (at current prices)

Sector	1977 ⁺ %	1978 ⁺ %
Commodity	75.5	76.6
Distribution	13.3	11.0
Services	11.2	12.4
G.N.P.	100.0	100.0

⁺ Provisional

Source, Central Statistical Organisation, Annual Abstract of Statistics, 1978, op.cit., P.134.

- (1) As indicated in tables (5.6) and (5.7), all the calculations are at current prices. This price could not reflect the full reality of the sectoral contribution in G.N.P. as a result of differences in price index changes between these sectors. Hence, it would be better to use figures at constant prices, but unfortunately such information covering the whole period were not available.
- (2) Economic Department, National Development Plan, 1976-1980, op.cit., P.C.

also be seen as achievable goal since, on the one hand, the contribution of the oil sector decreased from about 60% in 1974 to about 54% in 1976, and on the other hand, the industrial and agricultural projects which were under construction during this period would most probably start operating adding a new value added to their sectors, which consequently increase their contribution to the G.N.P.

The growing importance of the socialist sector⁽¹⁾ is another important feature of Iraqi economy. Since 1958, the role of the socialist sector start growing, whether in terms of contribution to value added or to capital formulation. In 1960, its contribution to the G.N.P. was 19% (at 1966 constant prices).⁽²⁾ It increased to 35.7% in 1972 (both at current and 1969 constant prices). The dramatic increase took place after 1972. It reached 80.4% in 1977 and 77.7% in 1978. In contrast, the share of private sector decreased to only 22.3% of G.N.P. in 1978 (see table (5.8)). The dominant role played, in the recent years, by the socialist sector in the process of capital formulation and G.N.P., reflect the socialist transformations taking place in the country.

5.3.3. The Strategy of Sectoral and Spatial Development

The strategy of development in Iraq has changed according to the successive regimes governing the country. These changes in the strategy could easily be shown by reviewing different development programmes initiated in Iraq since 1950. Since this year, three main development stages could be distinguished, that is, the Stage of Partial Development Programmes extending from 1951-1959, the Stage of National Development Planning (1959-1969) and the Stage of Comprehensive National Development Planning (1970 and ahead).⁽³⁾

(1) By Socialist Sector, it is meant the means of production of different economic sectors belongs to the state.

(2) W.A. Al-Ali, op.cit., P.30.

(3) S.B. Abdul Allah and I. H. Al-Wa'ith, op.cit., P.2.

Table (5.8)

The Contribution of the Private & Socialist Sectors to National Income, 1964-1978

Year	(Current Prices)			(Constant Prices) 1969		
	Socialist Sector	Private Sector	Total	Socialist Sector	Private Sector	Total
	%	%	%	%	%	%
1964	23.4	76.6	100.0	23.4	76.6	100.0
1965	24.8	75.2	100.0	24.8	75.2	100.0
1966	24.9	75.1	100.0	24.9	75.1	100.0
1967	25.6	74.4	100.0	25.6	74.4	100.0
1968	25.1	74.9	100.0	25.1	74.9	100.0
1969	26.7	73.3	100.0	26.7	73.3	100.0
1970	27.3	72.7	100.0	27.3	72.7	100.0
1971	26.2	73.8	100.0	26.2	73.8	100.0
1972	35.7	64.3	100.0	35.7	64.3	100.0
1973	51.9	48.1	100.0	51.9	48.1	100.0
1974	71.5	28.5	100.0	71.5	28.5	100.0
1977 ⁺	80.4	19.6	100.0	N.A.	N.A.	N.A.
1978 ⁺	77.7	22.3	100.0	N.A.	N.A.	N.A.

⁺ Provisional

Sources, The years 1964-1974 from, Economic Department, Economic Indicators of Economic Development in Iraq, op.cit., PP.16-17.

The years 1977-1978, from, Central Statistical Organisation Annual Abstracts of Statistics, 1978, op.cit., PP.135-136.

In 1950 a new era of organised development was started by establishing the first central planning organisation (The Iraqi Development Board) as a governmental body responsible for preparing and implementing "a general economic and financial plan for the development of the resources of Iraq and the raising of the standard of living of her population."⁽¹⁾ Accordingly, the Development Board produced its First Five Year Development Programme for the period 1951-1956. Out of 155.4 million I.D., the total allocation of this development programme,⁽²⁾ 34.4% was allocated to agriculture sector, mainly to dam construction and water control projects. The industrial and transportation and communication sectors took second and third place respectively (see table(5.9)). The Second Five Year Development Programme produced by the Development Board for the period 1955-1959 continued to emphasise the agriculture sector. Out of 304 million I.D., the total investment allocated to this programme, 37.6% was channeled to the agriculture sector. In second place comes the transportation and communication sector, then the building and services sector, with 24.4% and 20% of the total investment respectively. The industrial sector dropped to fourth place with only 14.3% of the total. The priorities given to different sectors in the second version of this programme (1955-1960), remained almost the same except increasing the total allocation of the programme to 500 million I.D. and increasing the share of building and services by 4% while reducing that of agriculture by almost the same percentage.

(1) K.M.Langley, The Industrialisation of Iraq, Harvard University Press, Cambridge, Mass., 1961, P.167.

(2) The first amount allocated to the programme was about 65.7 million I.D. The changes occurred in the middle of 1951 in oil revenue led to the replacement of this programme by a new one with a total allocation of 155.4 million I.D. The changes in oil revenue came as a result of a new agreement with the oil companies, in August 1951. According to this agreement the profits were divided on a 50/50 basis instead of the basis of royalties at the rate of 6 shillings (gold) per ton of crude oil as was the case previously. This considerably increased the revenue from oil (they increased more than five times in 1952 over those of 1950, and by 1955 they had increased more than ten times). N. Jalili, Urban-Rural Development Policies for Iraq, Unpublished Ph.D. Dissertation, University of Pennsylvania, 1965, P.2.

Table (5.9)

Allocations in the Various Iran Development Programmes for the Period 1951-80
According to Economic Sectors (Millions I.D.)

Programme Sector	1951 - 56 programme		1955 - 59 programme		1955 - 60 programme		1959 - 61 programme		1961 - 66 programme		1965 - 69 programme		1970 - 74 programme		1976 - 80 programme	
	value	%	value	%	value	%	value	%	value	%	value	%	value	%	value	%
Agricultural	53.4	34.4	114.4	37.6	168.1	33.6	47.9	12.2	113.0	20.0	146.5	23.2	366.2	19.0	2162.9	15.3
Industrial	31.0	19.9	43.6	14.3	67.1	13.4	48.7	12.4	166.8	29.4	175.0	27.7	391.0	20.2	4493.5	31.7
Transport and Communications	26.8	17.2	74.2	24.4	124.4	24.9	100.8	25.7	136.5	24.1	103.8	16.4	219.3	11.4	2301.6	16.2
Buildings and Services	18.0	11.6	60.9	20.0	123.2	24.6	190.7	48.7	140.1	24.7	113.8	18.0	283.0	14.6	3066.4	21.6
Others	26.2	16.9	11.4	3.7	17.3	3.5	4.0	4.0	10.0	1.8	92.6	14.7	672.6	34.8	2149.5	15.2
Total	155.4	100.0	304.3	100.0	500.0	100.0	392.2	100.0	556.3	100.0	631.7	100.0	1932.1	100.0	14173.9	100.0

Notes: There has been an Investment Programme in 1975 which covered the period between 31.3.1975 until 1.1.1976. 1076 million were allocated of which 207.5 million I.D. were assigned to Agriculture, 448 million I.D. to industry, 166 million I.D. to transport and communications, 188 million I.D. to Building and Services and 66.5 million I.D. to other sectors, (See Central Statistical Organisation, Annual Abstract of Statistics, 1978, op.cit., P.144).

Sources, The Years from 1951 - 1966 see, A.K. Hirmis, op.cit., Table (1.4).

The Years from 1965 - 1974 see, Central Statistical Organisation, Annual Abstract of Statistics, 1978, op.cit., P.144.

The Years from 1976 - 1980 compiled from reports prepared by Physical Planning Commission of the Ministry of Planning.

To sum up, at this stage of Iraqi planning experience, the development policy of the Development Board, guided by the recommendations of International Bank for Reconstruction and Development, the British experts Lord Salter and Arthur D. Little - put great emphasis on investment in physical infrastructure and in social overhead capital, e.g., road network, irrigation and flood control projects, electricity, housing and education facilities, without drawing a clear industrial policy. This stage of planning, which is called the partial development plans stage did not include planning for education, man power, spatial planning etc. Finally planning and implementation, in this stage were undertaken by the same body (the Development Board).⁽¹⁾

In the second stage of development planning, three national development programmes were produced. The first for the period 1959-1961,⁽²⁾ the second for the period 1961-1966 and the third for 1965-1969. The planning board at this stage of development in Iraq adopted a policy which concentrated on industrial development. Of the 566.3 million I.D. allocated to 1961-1966 development plan, 29.4% was devoted to the industrial sector, 24.7% to the building and service sector, 24.1% to the transport and communication and 20% to the agricultural sector. The 1965-1969 National Development Plan continued to replace a great emphasis on the industrial sector. Of its 631.7 million I.D., 27.7% was devoted to

(1) S.B.Abdul Allah, and I.H.Al-Wa'ith, op.cit., P.3.

(2) This plan was named the Temporary Economic Plan, because it came in the transitional period in the political system (from Monarchy to Republic) and in the economic system (from a completely free market economy to a rather centrally-planned economy), so the new government, did not have enough time to produce a five years development plan according to the new changes. In order not to stop the implementation of at least some strategic projects, the government produced this temporary brief development plan, which did not reflect fully its development strategy. After setting this plan the government started evaluating the investment policies adopted by the Development Board, which after the revolution is replaced by the Planning Board with many other institutional changes. (For more details on this transitional period see, for instance, S.B.Abdul Allah and I.H. Al-Wa'ith, op.cit., P.3; and A.Mahboob, Evaluation of Planning Experience, 1951-1968, (In Arabic), Ministry of Planning, Baghdad, Document No. 1, 1976, P.20.

the industrial sector, coming in the second place was the agricultural sector with 23.2%.

Development since the beginning of this stage was centrally planned and decentrally implemented.

In the third stage of Iraq's development policy, which is named the state of comprehensive national development planning, two national development plans were implemented, that is, 1970-1974 and 1976-1980. Both plans were implemented under the leadership of 1968 Revolution which paid special attention to planning, taking into account three main considerations in formulating national development strategies:⁽¹⁾

1. the objective study and analysis of the inherited Iraqi economy to discover gaps, define resources and assess potentials;

2. the building of a strong, developed economy, that will continually increase the level of incomes and at the same time bridge the income gaps between social classes and between various regions of Iraq and between urban and rural areas;

3. the liberation of the Iraqi economy from all vestiges of foreign domination and the restructuring of the Iraqi economy in order to bring about increased diversification of the domestic product and a reduction of dependence on oil revenues as a source of foreign currency.

Accordingly, both plans placed strong emphasis on the industrial sector and also allocated substantial investment for agriculture, transportation and communication and building and services. The total financial resources allocated to 1970-1974 National Development Plan was about 1932 million I.D. of which 20% devoted to industrial sector and 19% to agriculture. In the 1976-1980 National Development Plan, which characterised by a huge increase in the financial resources available as

(1) Ministry of Information, Revolutionary Iraq 1968-1977, op.cit., and Economic Department, National Development Plan 1976-1980, op.cit.

a result of the nationalisation of oil in 1972, 31.7% of the total investment which reached to about 14174 million I.D. was allocated to the industrial sector. In the second place come the buildings and services sector with 21.6% of the total (see table (5.9)).

However it should be noted that the total financial allocation in the successive National Development Plans do not reflect by itself the whole development picture. What is, at least, of equal importance the level of the implementation of the projects contained in the development plans. A very important study concerning the statistical correlation between total investment allocation and the actual expenditure indicates that the implementation level was low until 1970. It was found to be 54.6% and 54.2% for the periods 1950-1959 and 1959-1969 respectively. The level of implementation increased to 61.1% for the National Development Plan 1970-1974 and to 85.2% for the 1975 investment programme. (see Table (5.10)).

Table (5.10)

The Level of Implementation for the Period 1951-1975

Period	The Level of Implementation (%)*
1951-1959	54.6
1959-1969	54.2
1970-1974	61.1
1975	85.2

*The level of implementation is measured in terms of the percentage of the actual expenditure to the total investment allocation.

Source, Extracted from S.B.Abdul Allah and I.H.Al-Wa'ith, op.cit., Table (1), P.6.

Although data on the level of implementation for the National Development Plan 1976-1980 have not yet been published, an effort was made to achieve high implementation rates and the beneficiary departments

from the development projects during this period were asked to present to the central planning authorities an annual development programme proposals that could be implemented in at least 80 percent.

Accordingly, the last development stage 1970-1980, not only characterised by far higher financial allocation but also by higher implementation ratio which means that the socio-economic aims and objectives stated in the development plans were more achievable.

The higher implementation capacity was due mainly to the development in the Iraqi planning experiences and the follow up system; the provision of the basic implementation requirements represented by the site for the projects, raw materials in addition to financial resources; and the dependence on foreign companies in the implementation of basic and highly technical projects in a definite periods of time.

The scarcity or non-availability of reliable data on the various regions of Iraq makes it extremely difficult to make a statement about the growth and development of the spatial economy of Iraq. The only reliable data that can be adopted for such a task is that of the distribution of investment by Muhafadahs. However, even this data are not available for all the development programmes implemented in Iraq. Nevertheless there is a belief that, the pattern of sectoral investment during the 1950's was concentrated in a few major urban centres. Al-Jabiri, for instance, noted that, the pattern of sectoral investment during the fifties was not only urban oriented, that is, about two-thirds of the total investment gone to urban areas but also most of these investments have been directed to large urban centres such as, the capital, Baghdad, the sea port, Basrah, Mosul and Kirkuk.⁽¹⁾ The trend, in most cases was for a greater share of development, investments and activities to be located

(1) Rasool F. Al-Jabiri, op.cit., P.179.

to capital Baghdad, which makes its position even more dominant.⁽¹⁾

The detailed data available on the spatial distribution of investment for the National Development Plan 1965-1969 suggest that the trend of concentrating investment in Baghdad and Basrah continued. As can be seen from table (5.11), about 31% of the investment was devoted to Baghdad, 13% to Basrah. A comparatively higher proportion of investment was channelled to the Babylon Muhafadah (9% of the total investment) for establishing heavy industrial plants to produce automobiles, textiles and agricultural harvesters. Investment was similarly concentrated in Anbar and Maysan Muhafadahs, to establish mainly a glass industry and cement industry in the first and sugar cane industry in the second. The share of the last two Muhafadahs was 6.6% and 5.9% respectively. The table indicates that less attention was paid to northern parts of the country, including Kirkuk and Ninevah, because of the civil war at that time in most parts of this region. The share of both Sulaimaniya and Arbil was about 3% of the total investment compared to about 10% their share of total population. Less attention was also paid to the depressed south (excluding Basrah) and to Kerebla.

Although detailed data on the distribution of investment of the next National Development Plan, 1970-1974 do not exist, a study carried on by researchers of the regional planning department of the Ministry of Planning, indicate that once again Baghdad and Basrah took the greatest share of the total investments, followed by Anbar, Babylon, Ninevah, Ta'mem, Wasit and Diala (see figure (5.4)). The relative importance given to Arbil, D'hok and Sulaimaniya increased although they were still under the country's average. The Southern Muhafadahs

(1) W.A. Hilmi, op.cit., P.248.

Table (5.11)

Spatial Distribution of Investment in 1965-1969
and 1976-1980 Five Years Development Plans by
Economic Sectors and in Relative Terms

Muhafadah	1965-1969 Development Plan					1976-1980 Development Plan				
	Agri-culture	Industry	Transport and Communications	Buildings and Services	Total	Agri-culture	Industry	Transport and Communications	Buildings and Services	Total
Baghdad	12.9	24.3	31.0	54.0	30.7	13.7	11.8	26.8	35.0	20.7
Basrah	0.7	24.0	17.3	6.8	13.4	5.5	35.1	20.3	10.4	21.2
Ninevah	1.3	5.4	8.6	7.8	5.9	3.4	3.1	4.3	8.7	4.7
Ta'mem	9.0	7.5	3.1	2.1	5.5	7.0	2.4	2.5	4.1	3.6
Arbil	1.7	0.4	1.8	3.4	1.7	2.2	0.5	5.2	4.0	2.7
Sulaimaniya	1.3	1.2	1.3	1.5	1.3	2.4	2.1	4.0	4.1	3.0
Diala	14.6	0.4	2.6	3.2	4.5	19.2	2.0	2.2	3.8	5.3
Anber	10.4	5.0	8.7	3.3	6.6	6.1	12.3	15.1	3.5	9.9
Wasit	9.7	3.9	2.9	1.6	4.3	16.5	0.7	1.5	2.5	3.9
Maysan	22.4	0.4	2.3	2.4	5.9	3.1	3.0	1.7	3.0	2.7
Babylon	4.9	20.9	3.1	2.9	9.0	3.2	3.8	2.8	2.1	3.1
Kerebla	1.8	0.4	1.1	4.0	1.7	1.7	1.6	0.7	2.7	1.7
Qadisiya	4.9	3.3	8.2	3.2	4.8	3.8	1.8	1.9	2.1	2.2
Thi-Qar	4.4	2.9	8.0	3.8	4.7	2.4	6.3	2.1	2.3	3.8
Muthana						0.6	0.9	1.1	2.0	1.1
D'hok						2.9	0.2	4.4	2.7	2.2
Salah Al-deem						6.0	10.1	2.6	3.1	6.2
Najaf						0.5	2.3	0.8	3.9	2.0
Total	100	100	100	100	100	100	100	100	100	100

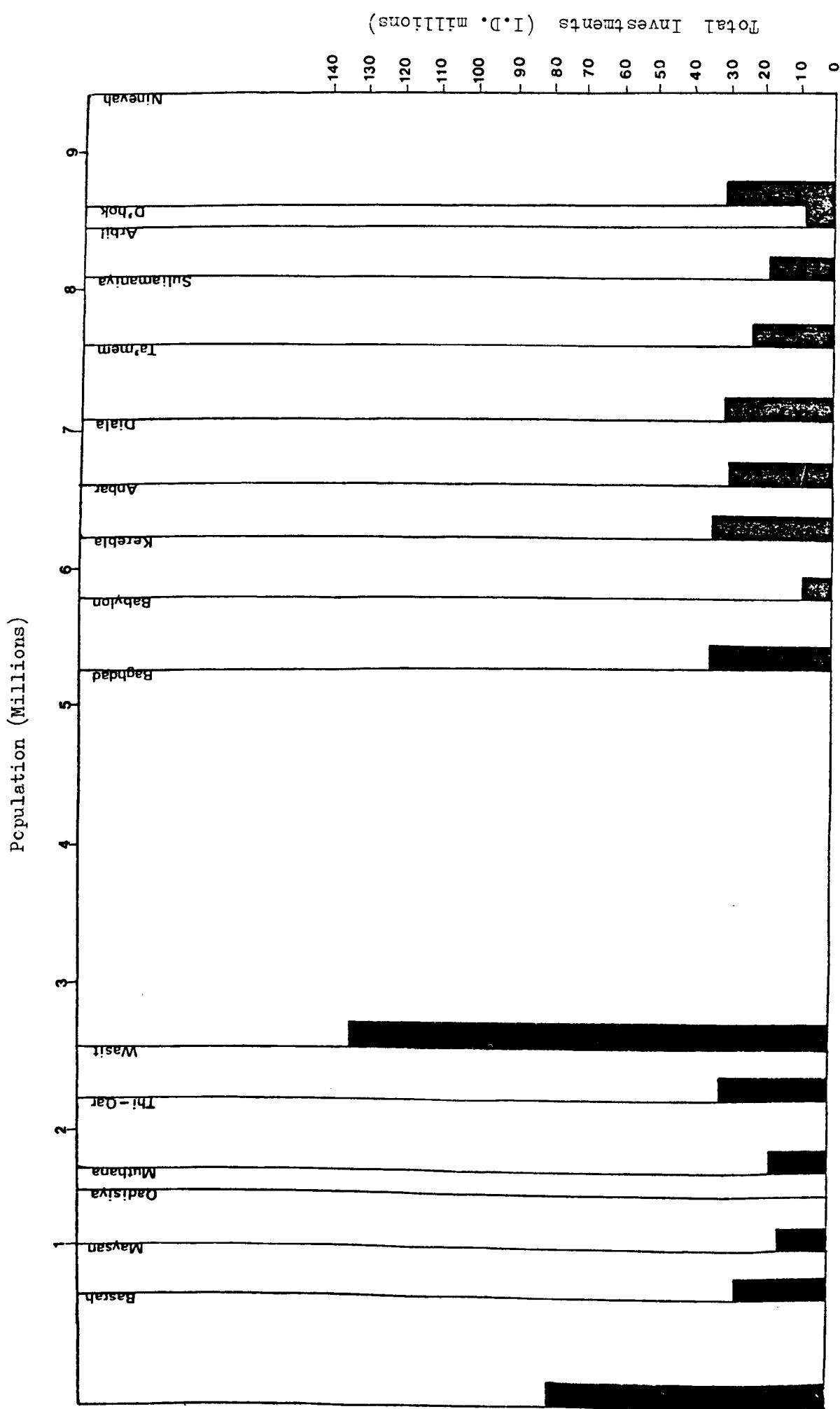
Note: For the reasons of the blanks see table (5.1), footnote number (4).

Sources, The years from 1965-1969 are taken from M.M.Al-Rawi and R.F.Al-Jabiri, Migration to Baghdad 1947-1990, Ministry of Planning, Regional Planning Department, Study No.(2), 1975, Tables 18-21 and Figures Nos. 2-5, PP.38-41, 44, 51 and 66.

The years from 1976-1980 compiled from reports prepared by Physical Planning Commission of the Ministry of Planning for the years 1976-1980.

Figure (5.4)

Spatial Distribution of Investment in the Development Plan 1970-1974



Mukafadats

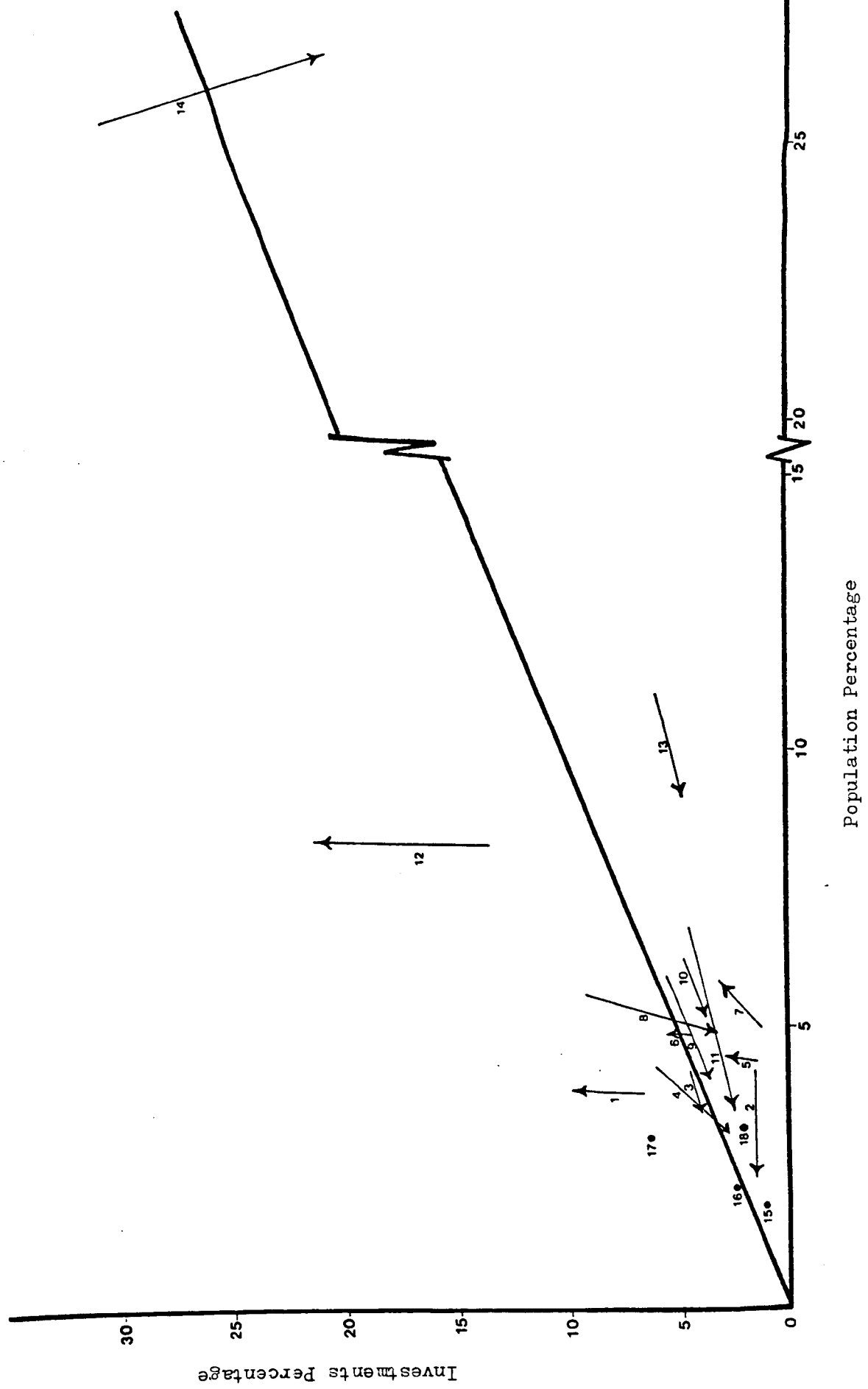
Source, M. M. Al-Rawi and R. F. Al-Jabiri, *op.cit.*, Figure (4).

of Thi-Qar and Qadisiya, Kerebla in the central region and Ninevah in the northern region obtained the lowest per capita investment. The per capita share from investments was 22.3 I.D. in Kerebla, 31.8 I.D. in Thi-Qar, 32.7 I.D. in Ninevah against 130 I.D. in Baghdad, 102.8 I.D. in Anbar, 97.6 I.D. in Basrah, 86.5 I.D. in Wasit and 53.9 I.D. the average per capita investment for the whole country.⁽¹⁾

The spatial distribution of investment of the 1976-1980 National Development Plan, indicates that for the first time, Baghdad came in the second place with 20.7% of the total investments allocated to this plan. Basrah Mhuafadah took the lead with 21.2%. Anbar Muhafadah came in the third place with 9.9%. In both of the latter Muhafadahs about 50% of their share from investment was channelled to the industrial sector. A comparatively higher proportion of investment was channelled to the newly created Muhafadah of Salah Al-deem with 6.2% of the total investment compared to its 3% share of the total population. The relative importance given to the northern part of Iraq (Sulaimaniya, Arbil and D'hok) was increased. The percentage devoted to the newly created D'hok Muhafadah was 2.2% compared to its 2.1% share of total population, while the percentage share of both Arbil and Sulaimaniya Muhafadahs increased from 1.7% and 1.3% in the 1965-1969 development plan to 2.7% and 3% in the latter development plan. The Southern Muhafadahs of Thi-Qar and Qadisiya continued to receive less attention. The relative importance given to Babylon, Maysar and Wasit has declined compared to the 1965-1969 National Development Plan (see both table (5.11) and figure (5.5)). The last figure illustrates the changes in the relative importance given to each Muhafadah compared to its population share for both 1965-1969 and 1976-1980 National Development Plans.

(1) M.M.Al-Rawi and R.F.Al-Jabiri, op.cit., P.65.

Figure (5.5)
Relative Changes of Investment Versus Population, 1965-1969 and 1976-1980



Muhafadaha

1. Anbar
2. Kerebla
3. Wasit
4. Mayson
5. Arbil
6. DIALA
7. Sulaimaniya
8. Babilon
9. Te'mer
10. Thi-Qar
11. Qadisiya
12. Basrah
13. Ninevah
14. Baghdad
15. Muthane
16. D'hok
17. Salah Al-Deen
18. Najaf

However, although it is clear that even in the last development plan one can notice clearly that the relative importance given to each Muhafadah is not equal even if their share of total population is taken into consideration, the plan has adopted a fair principle in distribution of investments among different regions of the country. In building, services and education sectors the distribution of investment corresponds highly to the population size and/or percentages and in some cases to reduce the gap between different Muhafadahs created as a result of previous pattern of distribution of the investments allocated to such sectors. Allocation to other sectors, such as the industrial and the agricultural sectors do not associate directly with population size, but rather with development potentialities of such activities. Accordingly, the plan, as far as the industrial sector is concerned concentrated on Basrah, Anbar, Baghdad and Salah-Al-deen Muhafadahs where industrial development potentialities exist. In the agricultural sector, the plan gave special attention to Daila, Wasit, Baghdad and Ta'mem Muhafadahs. In the transportation and communication sector attention was given to Baghdad, Basrah, Anbar and the Northern Region (Arbil, D'hok and Suliamaniya)(See table (5.11)). In doing so the plan aimed at directing the available financial resources to create a few main development poles other than Baghdad to reduce the latter's increased dominance in almost every sense. Hence, by implementing the latter development plan, decentralisation of both development and population distribution is expected to be achieved to some extent.

5.4. Spatial Development and Distribution of Industry

In general, it was found that the development of industrial projects in Iraq for the period before 1950 was very limited. The industries prevailing at that time were characterised by small size, slow growth

and an orientation to domestic raw material.⁽¹⁾ Only the industrial projects in which the industrial State Bank held shares were relatively large in size. It was estimated that the total investment allocated to industry to 1950 did not exceed 3.9 million I.D., employing a total of 2626 workers.⁽²⁾

Development of industries, in general, and large scale industries, in particular, started in early 1950's. The first industrial census in 1954, showed that there were 22460 industrial projects, of which 727 were large-scale projects, employing 44140 persons and the rest were small-scale, employing 45881 persons or 50.8% of the total.⁽³⁾ Recent statistics shows that in 1976, there was 39148 industrial projects, of which 1479 were large-scale employing 142740 persons and the rest, small-scale employing 85460 persons or 37.3% of the total.⁽⁴⁾

The details in table (5.12), using three main industrial development indicators (number of establishments, number of employees and value added), for different periods (1960, 1969 and 1976), best illustrate the development and spatial distribution of large-scale manufacturing industries. Until 1960, whether number of establishments, employees or the value added is taken into consideration, the trend in manufacturing development was to concentrate most industries in Baghdad. Its share was 53.4% of the total number of establishments (880 large-scale establishment); 60.3% of the total number of manufacturing employment (58946 employees) and 74.6% of the total amount of the value added generated by these industries (36800 000 I.D.). This trend has intensified in 1969 where the share of Baghdad reached to 62.4% of the

(1) K.M.Langley, op.cit.; M.S.Hasan, Economic Development in Iraq, (In Arabic), Al-Maktaba Al Asryia, Beirut, 1965, PP.281-374; A.Al-Najar, Industrialisation Policy in Iraq, (In Arabic), Unpublished Ph.D.Thesis, University of Al-Iskandariya, Egypt, 1973; and J.Hashim et.al., op.cit., Vol.1.

(2) A. Al-Najar, op.cit., P.329.

(3) Ministry of Economics, Annual Abstract of Statistics, 1954, Baghdad, 1954, PP.101-102.

(4) Central Statistical Organisation, Annual Abstract of Statistics, 1976, Ministry of Planning, Baghdad, PP.79 and 97.

Table (5.12)

Distribution of Large Industrial Establishments, Employees and Value Added, in Iraq
by Muhafadaha for the years 1960, 1969 and 1976

Muhafadaha	1960						1969						1976						
	Establishments		Employees		Value Added		Establishments		Employees		Value Added		Establishments		Employees		Out Put		
	No.	%	No.	%	Value (I.D. 000's)	%	No.	%	No.	%	Value (I.D. 000's)	%	No.	%	No.	%	Value (I.D. 000's)	%	
Baghdad	470	53.4	35576	60.3	27472	74.6	779	62.4	55319	65.1	75284	75.5	840	56.8	75274	52.7	326699	57.7	
Basrah	164	18.6	10279	17.4	3018	8.3	135	10.8	8016	9.4	4003	4.0	154	10.4	12359	8.7	35162	6.2	
Ninevah	70	8.0	5637	9.6	2543	6.9	62	5.0	6472	7.6	6670	6.7	108	7.3	10563	7.4	45264	8.0	
Ta'mec	17	1.9	415	0.7	96	0.3	32	2.5	1190	1.4	155	0.2	52	3.5	2011	1.4	9882	1.8	
Arbil	4	0.5	81	0.1	32	0.1	12	1.0	297	.4	52	0.1	34	2.3	5639	3.9	9865	1.7	
Sulaimaniya	6	0.7	481	0.8	605	1.6	7	0.6	1622	1.9	4711	4.7	26	1.8	1948	1.4	9950	1.8	
Diala	5	0.6	761	1.3	668	1.9	21	1.7	1699	2.0	2442	2.5	41	2.8	2509	1.8	9511	1.7	
Ar-Raq	3	0.3	128	0.2	22	0.1	11	0.9	417	.5	1232	1.2	14	0.9	2092	1.5	5948	1.1	
Musit	9	1.0	427	0.7	75	0.2	10	0.8	1296	1.5	216	0.2	11	0.8	3559	2.8	11546	2.0	
Mayaan	8	0.9	1030	1.8	184	0.5	30	2.4	1036	1.2	241	0.2	34	2.3	4529	3.2	12676	2.2	
Babylon	70	8.0	1870	3.2	1034	2.8	42	3.4	2935	3.5	1947	2.0	55	3.7	12437	8.7	56730	10.0	
Keretla	31	3.5	798	1.4	136	0.4	72	5.8	2652	3.1	847	0.8	33	2.2	2060	1.4	1639	0.3	
Qadisiya	8	0.9	928	1.6	777	2.1	17	1.3	1453	1.7	1774	1.8	11	0.7	1357	0.9	1284	0.2	
Thi-Qar	15	1.7	507	0.9	88	0.2	18	1.4	591	.7	134	0.1	14	0.9	1654	1.2	5064	0.9	
Eutkhana	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42	-	
D'hok	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	
Salah-Aldeen	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	0.4	10693	1.9
Hajaf	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32	2.2	1973	0.3
Total	880	100	58946	100	36800	100	1248	100	84995	100	99708	100	1479	100	142740	100	566309	100	

Notes (1) The table includes establishments of private, mixed and socialist sectors.

(2) In 1976 output is used instead of the value added due to the unavailability of published data concerning the value added for this year.

(3) For the reasons of the blanks see table (5.1), footnote number (4).

Sources, The years 1960 and 1969 are taken from A.K. Al-Fadli, Geographical Distribution of Industry in Iraq, Published Ph.D. Thesis, Al-Irshad Press, Baghdad, 1976, Table 24 and 25, PP.113-114 and 116-117.

The year 1976; number of establishments and employees are taken from Central Statistical Organisation, Annual Abstract of Statistics, 1977, op.cit., Table 417, Pt.90-92; and Value of Out - put is compiled from reports prepared by Physical Planning Commission of the Ministry of Planning.

total number of establishments (1248), 65.1% of the total number of employees (84995), and 75.5% of the total amount of the value added generated by these industries (99708000 I.D.)

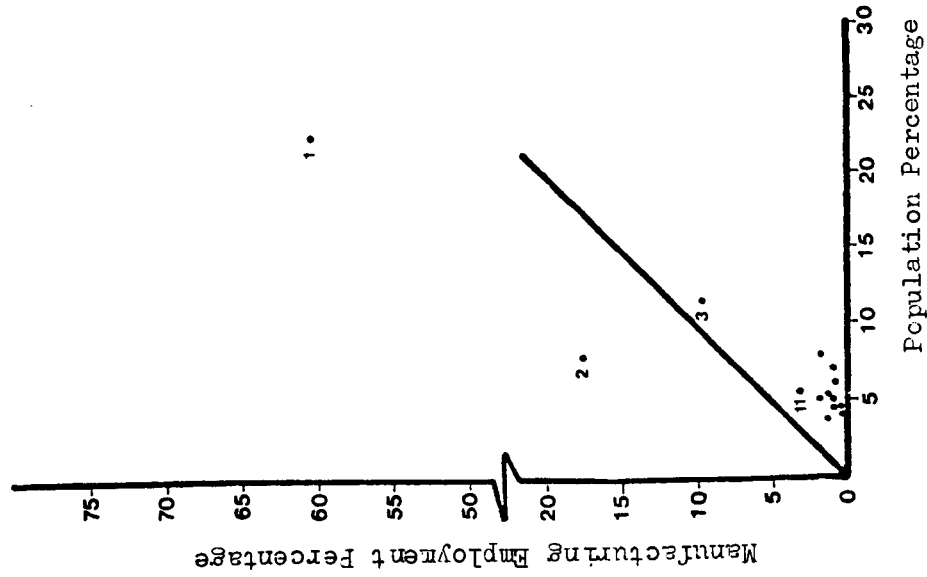
According to 1960 data, Basrah came in the second place, with 17.4% and 8.3% of the total employment and value added respectively. Although the relative importance given to Ninevah and Babylon Muhafadahs is high bringing them to the third and fourth place, it is less than their shares of the total population of the country at that year. The share of all other Muhafadahs was very low and there were many Muhafadahs receiving less than 1% of the industrial development fruits, whether in terms of employment and/or value added. Figure (5.6.1), shows that for 1960, only two Muhafadahs out of fourteen were above the maximum possible efficiency line, that is, their share from industrial employment is higher than their population percentage, especially Baghdad, which attract about 60% of total industrial employment compared to about 22.5% of the total population of the country.

In 1969, although the percentage share of both Basrah and Ninevah declined, whether in terms of employment and value added, they still came in the second and third place except for Ninevah, which came in the fourth place, as far as the value added is concerned. The relative importance given to Suliamaniya has increased together with Diala and Kerebla. However, the trend of concentration in Baghdad has been intensified (see figure (5.6.2)).

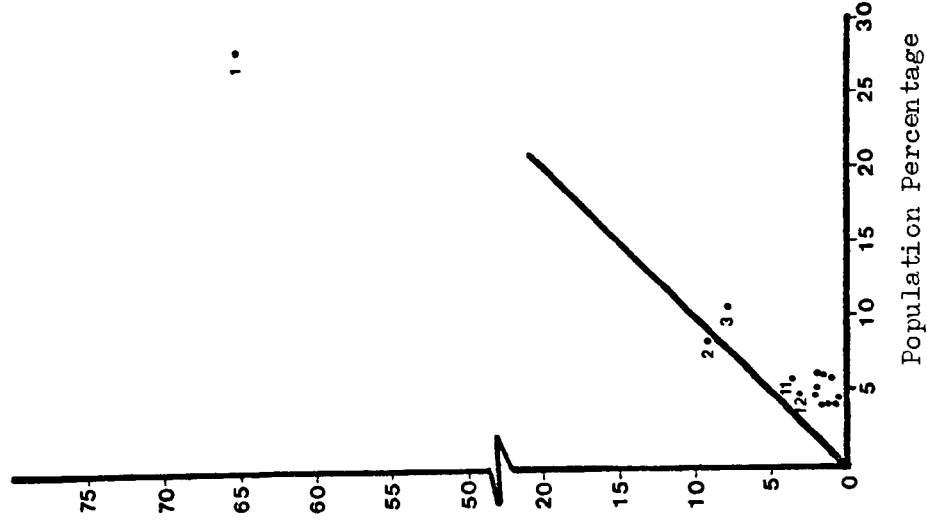
In 1976, although Baghdad continued to receive the highest proportion of industrial development, there was a tendency toward decentralising this development. Accordingly, the share of Baghdad Muhafadah from both employment and output decreased to 52.7% and 57.7% of the total. For the first time, Babylon Muhafadah came in the

Efficiency of Distribution of Iraqi Manufacturing Employment by Muhafadehs for the Years:

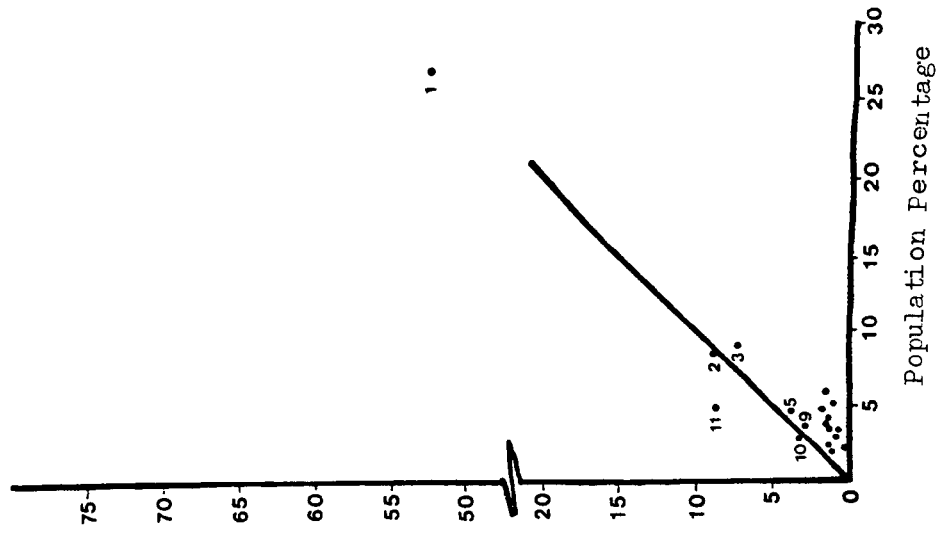
(1) 1960



(2) 1969



(3) 1976



Muhafadehs

1. Baghdad
2. Basrah
3. Ninevah
4. Ta'mer
5. Arbil
6. Sulaimaniya
7. Diala
8. Anbar
9. Wasit
10. Maysan
11. Babylon
12. Kerbela
13. Qadisiya
4. Thi-Qar
5. Muthana
6. D'hok
7. Salah Al-deen
8. Nejaf

Note: the 45° line which represents the most efficient distribution pattern of manufacturing employment is for reference only.

second place with 8.7% and 10% of the total employment and output respectively. Basrah continued to receive comparatively a good share of development, despite decreasing its share from employment to 8.7% of the total. A very good example of decentralising industrial development, is the relative importance given, again for the first time, to the relatively depressed Muhafadahs of Mayasan and Wasit and to Arbil Muhafadah. The share of many other Muhafadahs from both employees and output also increased (see table (5.12)). In total, figure (5.6.3), illustrates the changes in the distribution of large manufacturing employment in 1976. The main characteristics of this distribution are, first the decline in the share of Baghdad; second, two additional Muhafadahs moved above the efficiency line; and third, the share of most other Muhafadahs is being closer to the efficiency line.

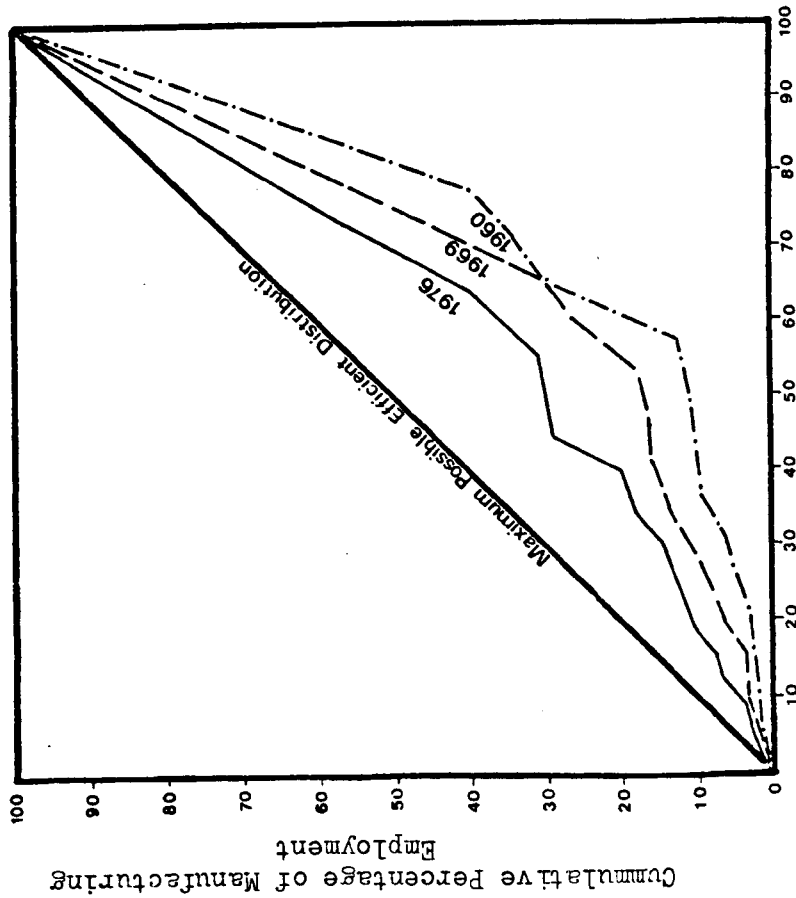
Plotting Muhafadahs percentages of both employment and value added against population percentages on a Lorenz curve, one can find clearly that more equal distribution of industrial development is achieved through successive studied periods, both in terms of employment and value added (see figure (5.7)). Part one of the figure shows that in 1960, about 60% of the total population were receiving only about 10% of the total industrial job opportunities. It increased to about 16% in 1969 and 30% in 1976. Part two of the figure, shows almost the same trend regarding the distribution of value added generated by the large-scale industries. The figure shows that 50% of the population were generating only about 9% of the value added in 1960. It increased to about 11% in 1969 and 26% in 1976. This implies that; first, the rate of transformation toward more equal distribution of industrial development fruits in the latter period is higher than it was in the first period; second, decentralisation of development in the latter period is more apparent; and third, the growth is becoming more balanced,

Figure (5.7)

Lorenz Curves of Iraq Distribution of Industrial Development by

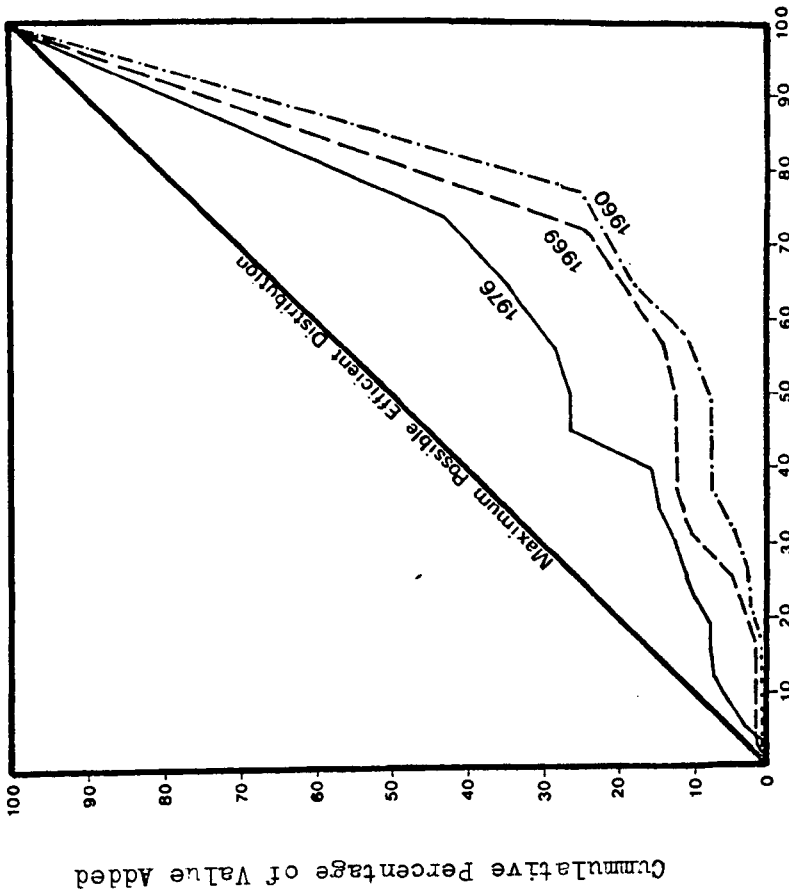
Muhafadahs for the Years 1960, 1969 and 1976

(1) Using Manufacturing Employment



Percentage of Governorates Population, ranked in ascending order.

(2) Using Value Added*



Percentage of Governorates Population, ranked in ascending order.

* Output value is used in 1976 instead of value added due to unavailability of data on the latter.

despite the fact that, the country still resembles a pattern of relative industrial concentration in its capital city and in a few other urban centres. The maturity of industries started in early periods of Iraqi industrialisation surely played an important role in bringing about the prevailing distribution pattern.

The above conclusions are supported if first, the distribution of the newly created industrial jobs for the latter periods is taken into consideration. Table (5.13) shows, that for the period 1968-1971, the distribution of job opportunities created is more equal than it was the case in previous periods. The share of Baghdad was reduced to 46.1% of the total created jobs. Ninevah and Basrah came in the second place containing 14.7% and 9.5% respectively. 6.7% of the new created jobs were channelled to Kerebla. Many other Muhafadahs have received between 2-2.5% of the total, with no Muhafadah containing less than 0.8%. The distribution of the new created industrial jobs for the period 1972-1975 became even more fair and the share of Baghdad was reduced again to 30.1%. just 5% higher than its population share. Basrah and Qadisiyia Muhafadahs came in the second place with 18.8% and 12.6% respectively. A relative attention was given to both Arbil and Thi-Qar Muhafadahs in this period. They received 7.2% and 6.6% of the total new created jobs. Second, as it has been noted in the latter section, the distribution pattern of industrial investment allocated in 1976-1980 National Development Plan will further increase the equality of distribution of industrial development fruits in every sense. Out of 4493.5 million I.D. allocated to industrial sector, only 11.8% was channelled to Baghdad, while Basrah Muhafadah contained about 35% of the total, Anbar Muhafadah received about 12.3%, Salah-Al-deen received about 10% and Thi-Qar Muhafadah received 6.3% (see table (5.11)).

Table (5.13)

Number and Percentages of Newly Established Firms, their Employment
and Investments by Muhafadahs for the period 1968 - 1975
(000's I.D.)

Muhafadahs	1968 - 1971						1972 - 1975					
	Establishments		Investments		Employment		Establishments		Investments		Employment	
	No.	%	Value	%	No.	%	No.	%	Value	%	No.	%
Baghdad	506	64.6	27523	32.3	6540	46.1	481	63.1	65525	19.8	8816	30.8
Basrah	19	2.4	24206	28.4	1354	9.6	32	4.2	110464	33.4	5376	18.8
Ninevah	54	6.9	9864	11.5	2124	14.7	51	6.7	21414	6.5	2023	7.0
Ta'mem	10	1.3	158	0.2	153	1.1	15	1.9	4500	1.3	498	1.7
Arbil	15	1.9	2520	2.9	265	1.9	20	2.6	14792	4.4	2069	7.2
Sulaimaniya	16	2.0	8250	9.7	533	3.8	9	1.2	935	0.3	219	0.8
Diala	35	4.5	1738	2.0	380	2.7	12	1.6	1987	0.6	682	2.4
Anbar	13	1.7	355	0.4	215	1.5	26	3.4	1314	0.4	382	1.3
Wasit	9	1.1	817	1.0	274	1.9	7	0.9	3079	0.9	278	1.0
Maysan	7	0.9	99	0.1	113	0.8	18	2.4	7013	2.1	826	2.9
Babylon	29	3.7	704	0.8	302	2.1	32	4.2	9524	2.9	1266	4.4
Kerebla	40	5.1	5085	6.0	949	6.7	32	4.2	1883	0.6	396	1.4
Qadisiya	18	2.3	3100	3.6	379	2.7	9	1.2	29281	8.8	3608	12.6
Thi-Qar	5	0.6	122	0.1	355	2.5	6	0.6	53237	16.1	1890	6.6
Muthana	3	0.4	139	0.2	152	1.1	5	0.9	5269	1.6	134	0.4
D'hok	4	0.6	565	0.8	98	0.8	7	0.9	844	0.3	188	0.7
Total	783	100	85245	100	14186	100	762	100	331061	100	28646	100

Source, A.K.Al-Fadli, op.cit., Table 23, PP.106-108

Finally, one should note that, the prevailing pattern of industrial concentration created a structural diversity differentiations between the relatively grown Muhafadahs such as Baghdad and Basrah and the less grown Muhafadahs, Muthana and Thi-Qar. The first group characterise by its structural diversity in terms of containing all industries constituting the manufacturing sector.⁽¹⁾ This with other facts of the degree of spatial concentration of industry in few urban centres, is in agreement with the findings of a U.N. Study, that in most developing countries, the prevailing

(1) A.K.Hirmiz, op.cit., PP.25-26.

tendency has been for industry to concentrate in a few locations, preferably in metropolitan areas.⁽¹⁾ However, the recent pattern of industrial development in the country will create more diversification in the relatively less developed Muhafadahs, in accordance with their development potentials and the successive national development objectives.

5.5. Correlation Between Urbanisation and Economic Development Processes

It has been emphasised in Chapter two that a close correlation exists between economic development and urbanisation, and that industrial development is the main vehicle of urbanisation process, especially in developed countries during their course of development. In less developed countries, although various factors affecting their rapid urbanisation differentiate them from the developed ones, it is evident that imbalances in the spatial distribution of population are a consequence of the spatial dimension of investment concentration. Earlier analysis in part one of this research indicates that there are few, if any, less developed countries that do not suffer from this problem, and Iraq is no exception.

The analysis of the previous three sections of this chapter, indicates clearly that the development strategy has affected, to a large extent, the spatial distribution of population and urbanisation pattern. In Iraq, the high rate of urbanisation started early in the 1950's, exactly at the same period of creating the organised development programmes and speeding the rate of the development of the country. In different development planning stages, the positive correlation between urbanisation trends and urban population distribution, on the one hand, and investments distribution, on the other hand, can be illustrated and supported by tracing the growth of Muhafadahs urban population during these

(1) U.N.I.D.O., Industrial Location Policies and Policy Measures in Developing Countries, U.N., New York, 1967, P.3.

periods. The correlation coefficient between urban population of Muhafadahs and investment allocation is found to be positive and very high. It takes the value of (+0.933) for the period 1965/1969 and (+0.765) for the period 1976-1980. This implies that the higher the urban population of the Muhafadahs is, the higher its share from investments is. The decline in the value of the correlation coefficient in the latter period confirm the previous analysis that decentralisation policies are more apparent in latter years.

Hence, the development strategies, directly affected the internal migration movement from the rural areas to urban centres (which makes up the major part of population movement) and from urban to other, mostly larger, urban centres. The orientation of most of economic development fruits, other than the agricultural one, to few urban centres (especially in the first two stages of development planning), mainly Baghdad, Basrah, Mosul and Kirkuk affected, to a large extent, population movement to these major urban centres. This argument is strengthened by the fact that, "The investment in agriculture though important, was not of the kind to yield either quick results or creates job opportunities in comparison with investment in industry, housing and transportation"⁽¹⁾.

In the same way, a positive association could be seen, if urban population growth is traced against the number of persons employing in large manufacturing industries. Again the analysis of the data given in section 5.2 and 5.4 indicates that the correlation coefficient between urban population of Muhafadahs and the number of manufacturing employment is a positive and almost a perfect one. It took the order of (+0.989) for the year 1969 and (+0.943) for the year 1976. This results confirm the previous analysis which shows that Baghdad, Basrah and Ninevah

(1) Rasool F. Al-Jabiri, op.cit., P.179.

Muhafadahs contain the highest percentages of large industries employment. They also contained the highest percentages of urban population and their central cities faced the highest rate of growth during the past four decades. For instance, the 75271 job opportunities provided by large manufacturing industries in Baghdad means that 451644 inhabitants of Baghdad Muhafadah are directly relying in making their living on such activities.⁽¹⁾ The importance of large industries on the growth of urban population would be at least doubled if the indirect effects and induced employment, that is, the employment multiplier effects is taken into consideration.⁽²⁾ During the seventies, the growing industrial importance of some other Muhafadahs, also affected the growth of their urban population. This is clear in case of Babylon and Kerebla Muhafadahs, where in late 1960's an automobile and harvesters factories were established in Babylon, together with the textile manufacturing and the growth of the canned food industry in Kerebla attracted both skilled and unskilled workers to these areas. Hence, for the first time in 1973, Babylon made a net population gain and attracted 49200 migrants, and Kerebla lost only 5100 migrants (see table (5.2)). In the same way, the increasing attention given to the northern region, after putting an end to the war, had affected to a large extent the population movement to urban areas of both Arbil and Sulaimaniya which experienced a net population gain in 1977.

However, although industrial development affects to some extent the redistribution of urban population since 1950, Iraq like many other less developed countries, provides ample evidence for questioning the frequently

(1) This has been extracted on the basis that the average family size in urban areas is 6 persons.

(2) As it will be shown in the next chapter, the regional study of the U.E.R. (Upper Euphrates Region) found that the regional employment multiplier effects is (2.035). Hence this figure is adopted here as an average for Iraq, since not much differences are expected between different parts of the country.

assured primary-secondary-tertiary development sequence. The tertiary component grows much earlier and faster, in Iraq, than secondary activity. Data on occupational structure of the labour force shows that in 1977, the country had slightly more than 32% of its workers in the primary sector, 9.3% of its workforce in manufacturing sector, whilst the tertiary activities employed about 58.6%.

Finally it should be noted that factors other than the economic ones have attributed to the growth of urban areas in Iraq. These factors could be; administrative, represented by practicing administrative functions by the central cities of Muhafadahs. The creation of new Muhafadahs in 1968 and 1976 have affected the growth of their central cities, as a result of the new functions given to them; religious, as it is the case in Najaf and Kerebla cities;⁽¹⁾ quality of life and social overhead capital in certain cities played also an important role in the attraction of economic activities and consequently population to these cities. This is the case for the cities of Baghdad, Basrah and Kirkuk.⁽²⁾ In some cases a collection of these factors have affected the growth of some urban areas. An ample example of this is Baghdad, the capital. Hilmi stressed this point and noted that "The abnormal growth of the capital city population could easily be attributed to a collection of factors. Politically, it is the seat of the central government in the country..., socially, the heterogeneity of the capital's population makes it an attractive place to all fractions of the Iraqi population and, economically, the city's strong predominance over the entire spectrum of economical activities on the nation... Together with a large share of public services, facilities and amenities...."⁽³⁾ To some extent, Basrah and Mosul cities are also a good example since they represent the central cities of the Southern

(1) Ibid, footnote (1), P.190.

(2) N. Jalili, op.cit., P.205.

(3) W. A. Hilmi, op.cit., P.248.

and Northern Macro Regions. In the near future, most likely, Arbil will join this group of cities since it is the centre of the Kurds autonomy region.

To sum up, instead of redistributing urban population so as to create a reasonable urban hierarchy, development policies in Iraq, at least till the early 1970's, have intensified the urban population concentration in the leading cities, in general, and Baghdad Metropolis, in particular. The recent changes in the pattern of investment allocation, with more investments going to the newly created development poles and relatively depressed areas, the migration trend will change in favour of these areas leading to a more balanced spatial hierarchy and less disparities in income.

5.6. Summary

Iraq has many common characteristics of other developing countries. The rate of population growth is one of the highest in the world. In recent years it shows to be higher than 3% per annum. Urban population growth is found to be even higher than that of the total population. Moreover, the most urgent problem in the urbanisation process, is not its rate of growth, but rather the pattern of distribution of urban population which is characterised by the predominance of a few metropolitan areas, in general, and the overwhelming dominance of the capital city, Baghdad, over time in particular.

The concentration of urban population in few major urban centres was due to the previous economic development policies practiced in the country which was oriented toward directing the highest shares of investment to these few major urban centres. It is found that a very close

correlation exist between urban growth and economic development, on the one hand, and between the former and industrial development, on the other hand. Hence, development policies in Iraq, at least until the early 1970's, instead of redistributing urban population so as to create a reasonable urban hierarchy have intensified the urban population concentration in leading cities and Baghdad, in particular. However, the recent changes in the pattern of investments allocation and the spatial development of the industrial sector, which characterise by more investments channelled to areas other than Baghdad, such as Basrah, Anbar, Salah Al-deen and the relatively depressed Muhafadahs will surely lead to a more balanced urban hierarchy and consequently reduce the regional disparities.

CHAPTER SIX
GENERAL BACKGROUND, SPATIAL DEVELOPMENT AND
URBANISATION OF THE U.E.R.
(EXISTING SITUATION AND FUTURE PERSPECTIVES)

CHAPTER SIX

GENERAL BACKGROUND, SPATIAL DEVELOPMENT AND URBANISATION OF THE U.E.R. (EXISTING SITUATION AND FUTURE PERSPECTIVES)

INTRODUCTION

Examination of different aspects of the region is a prerequisite process to regional studies of any sort. It sheds some light on the causes, limitations and constraints of different regional problems and 'thus helps in providing a basis for a more accurate solution. Accordingly, this chapter will examine; the natural characteristics of the study area; the past and present trends of development and its consequences on population growth, urbanisation trends and the land use pattern; and the potentialities of development in the study area. It will extend to include an analysis of the regional employment multiplier effects of the committed major development projects and the distribution of the expected urban growth within the study area.

6.1. Natural Features⁽¹⁾

6.1.1. Location

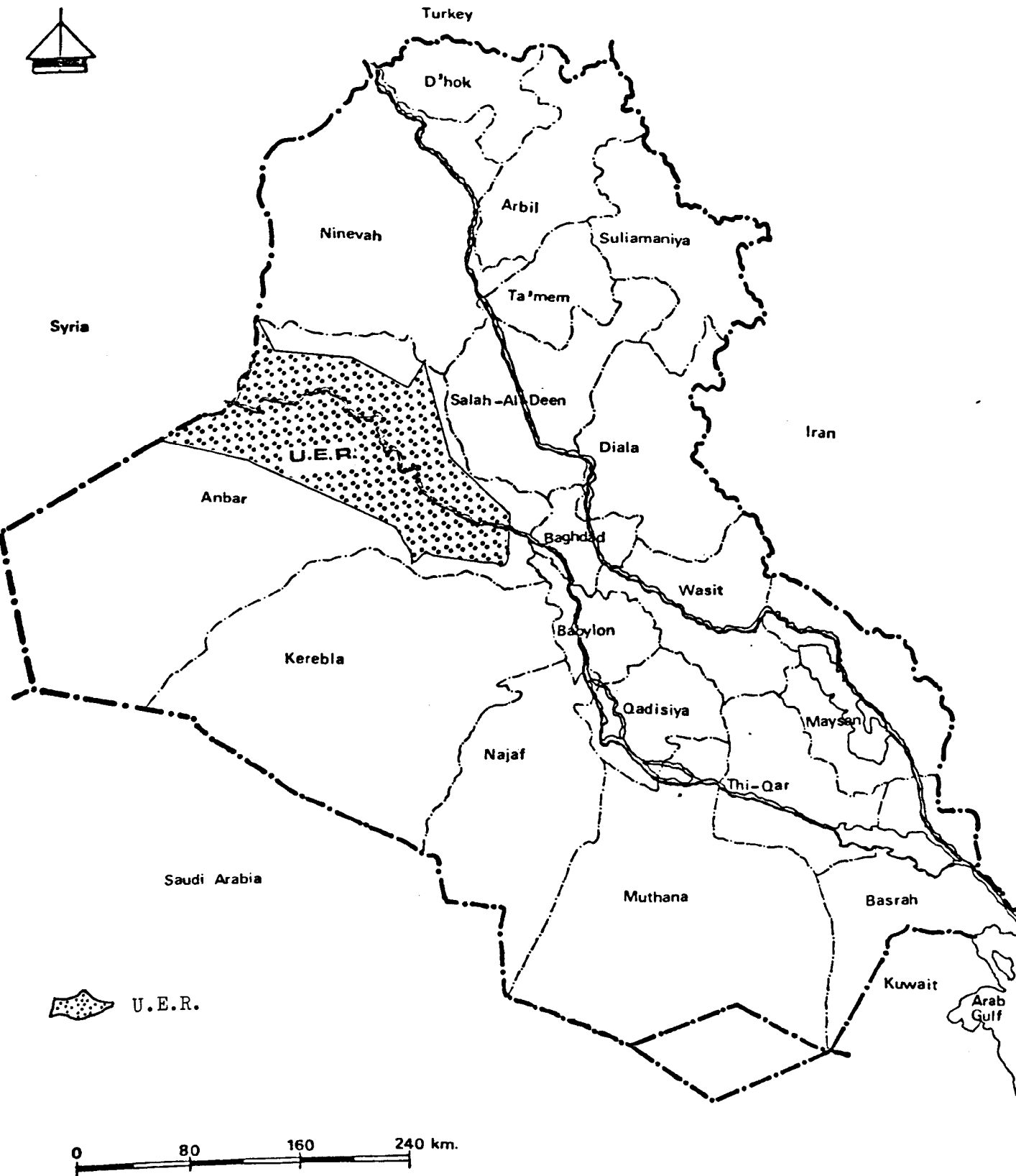
The U.E.R. is situated in the Western part of Iraq and in the Northern part of Al-Anbar Muhafadah of which it is a part. The region is bounded on the North by the Al-Jazira area, on the East by the metropolitan region of Baghdad, on the South by Western desert and on the West by Syria (See map(6.1.))

6.1.2. Topography

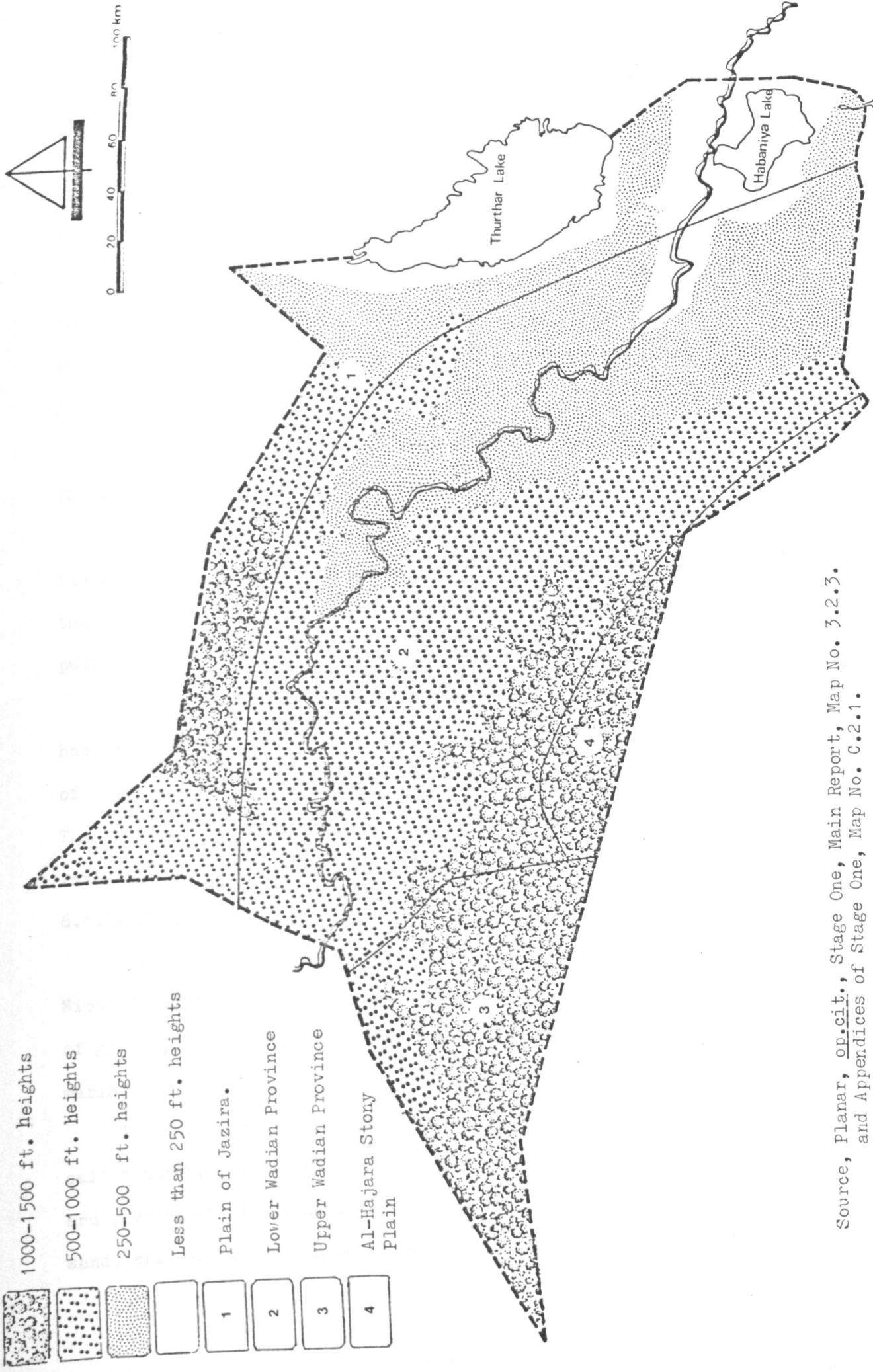
In-general, the regional topography is characterised by a gradual decrease in elevation from the Syrian border to Lake Habaniya. (See map (6.2)). This coincides with the Southeast directional flow of the Euphrates

(1) The source of information of this section is mainly from; Planar, Upper Euphrates Regional Plan and Resettlement of Haditha Reservoir Population, Stage One, Appendices, Baghdad, 1978, PP.C1-C18; and Regional Planning Department, Planning for the Upper Euphrates Region - Resettlement of Haditha Reservoir Population, Preliminary Report, (In Arabic), Ministry of Planning, Baghdad, 1975, PP.1-11.

Location of the U.E.R.



Topography of the U.E.R.



Source, Planar, op.cit., Stage One, Main Report, Map No. 3.2.3. and Appendices of Stage One, Map No. C.2.1.

River within the study area.

Within the Jazira province the elevations vary up to about 1000 ft. Generally speaking, the area is very flat and along the western borders and to the south there are low buttes and many shallow depressions that become lakes and marshes during the rainy seasons. The area west of the Euphrates River is a plateau type of gentle topography dissected by seasonal drainage channels. The plateau rises to the west and south reaching elevations of 1000 and 1500 ft. respectively. This area covers Al-Hajara and Lower Wadian Provinces.

Elevations in lower Wadian Province range from 50 - 750 ft., with the lower elevations along the north east boundary of the province.

The Wadi system south of the Euphrates valley is characterised by its Dendritic pattern, all the Wadis drain into the Euphrates. Some of the wider Wadis develop terraces which may be used for agricultural purposes.

The area South of the Euphrates River in the lower Wadian Province has an intricate system of shallow Wadis draining into the Euphrates, of these the major drainage systems are Wadi Al-Muhammadi and Wadi Hajiya. The area is also characterised by buttes and isolated hills of flat lying remanant of hard limestone and gypsum outcrops.

6.1.3. Soil Conditions

The geological substratum of the area is composed mainly of Miocene deposits, especially of Fars Formation which is composed mainly of gypsum, anhydrite, limestone, shales and local salt deposits, mudstones, marls and siltstones.

The soils are of a eolian lacustrine and fluvial origin with high salt content. The soils of Wadi contain subrounded pink and white cobbles and pebbles of limestone and siliceous rocks mixed with brown calcareous sand, silt and clay. In the inner Wadis the soil is made of a thin covering

of reddish brown calcareous sand. The floors of the shallow depressions are often covered with calcareous mud which exhibit typical mud cracks in the dry season.

Soil types in the Upper Euphrates river valley consist of a thin layer of reddish clay overlying massive gypsum. Secondary gypsum crystals are disseminated throughout most of the reddish clay, while limestone fragments are scattered over the surface.


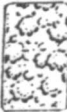
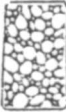
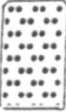


There are many ways to classify soil types emphasising either agricultural or physical properties. According to the agricultural classification, five types can be distinguished.

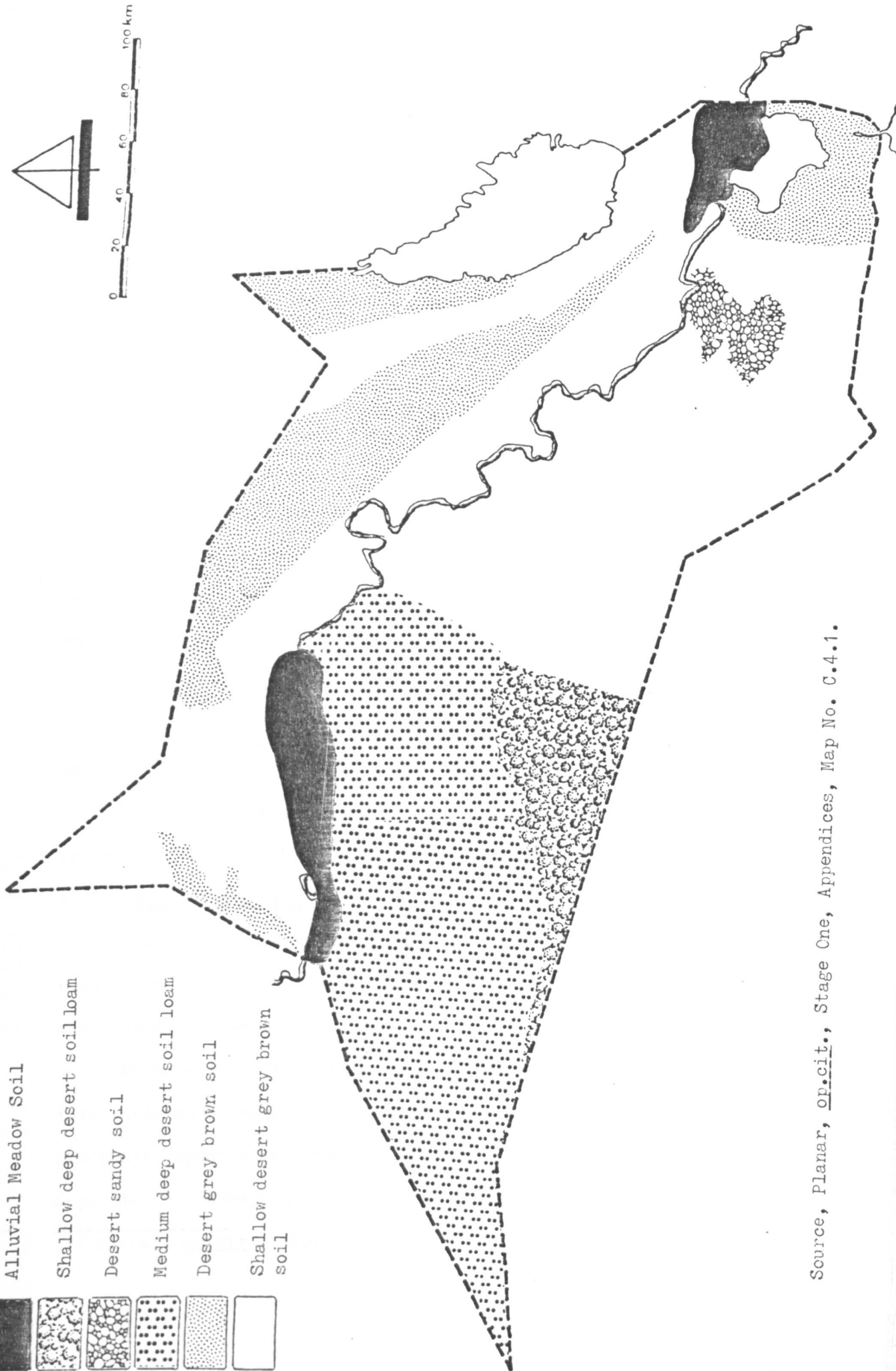
- Sierozem soils
- Reddish Brown soils
- Cray - Brown soils
- Litho soils
- Alluvial soils

The last type of soils which consist mainly of fluvial deposits of Euphrates river, are concentrated in a very thin strip along the river. The Cray Brown soils which concentrate in the Wadis beds, with not more than 500 metres in width, are utilised by Bidwin for crops cultivation. The other types of soils in the study area are not utilised for cultivation or uncultivable, either because they are very poor and/or because of the topographical problems. In future, the Reddish Brown soils could be utilised for cultivation of crops, vegetables in case of having 60 c.m. depth soil.

Map (6.3) shows a more general physical classification of soils in the study area.

Soil Classification in the U.E.R.

-  Alluvial Meadow Soil
-  Shallow deep desert soil loam
-  Desert sandy soil
-  Medium deep desert soil loam
-  Desert grey brown soil
-  Shallow desert grey brown soil



Source, Planar, op.cit., Stage One, Appendices, Map No. C.4.1.

6.1.4. Climate

The climate of the study area is typical of the semi-arid region i.e. extreme temperature ranges and meager precipitation. Throughout the year Westerly winds are prevailing. In summer Northern winds occur more frequently. The (Samom) dry hot wind with dust and sand occurs several times in the summer and also in April and May.

The area is also affected by dust storms comprising masses of air polluted with fine dust particles, these storms are related to wind direction and speed. The area is exposed to 10-15 dusty days during the non-rainy season.

The low winter temperatures cause frost to form due to cold air masses of below zero centigrade temperatures from the north and north east parts of Iraq. An estimate of 15-20 frost days per year are expected in most parts of the area.

The mean annual air temperature is 19° - 23° C. It decreases in January to 7° - 10° C and increases in July to 31° - 35° C. The absolute maximum temperature is 51° C, while the minimum one is -14° C.

The precipitation is 100 mm/year mainly in winter and spring, with no rainfall from June to September. The maximum wind speed is 21 m/sec.

6.1.5. Mineral Occurances

The area under investigation is characterised mainly with occurrences of non-metallic raw materials in addition to underground water aquifers and bitumen.

The main industrial rocks and minerals are dolomites, kaolinites, pure sandstones, sand, gravel, gypsum, in addition to the rich phosphate deposits and the iron deposits. All these types of mineral deposits in the region are found in commercial quantities⁽¹⁾ making the

(1) Planar, op.cit., Table E2.15, P.E22.

region, as it will be seen later in this chapter, the main seat of the related industrial activities.

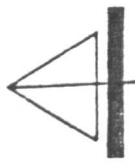
Mineral occurrences in the study area are shown in Map (6.4). The phosphate deposits of Iraq occur in two main localities Rutba and Akashat. The Akashat deposit occurs to the North of the Rutba deposits, near the Iraqi-Syrian borders. Concerning the iron deposits, there are two main locations namely Husainiyat and Gaara. The Western desert provides almost unlimited reserves of various kinds of non-metallic raw materials, mainly of carbonate rocks i.e. limestones, and dolomites.

The glass sand of Rutba sandstone formation which is constituted mainly of pure silicon dioxide makes an excellent raw material for the glass industry. The glass sand quarry is located some 15 km. West of Rutba.

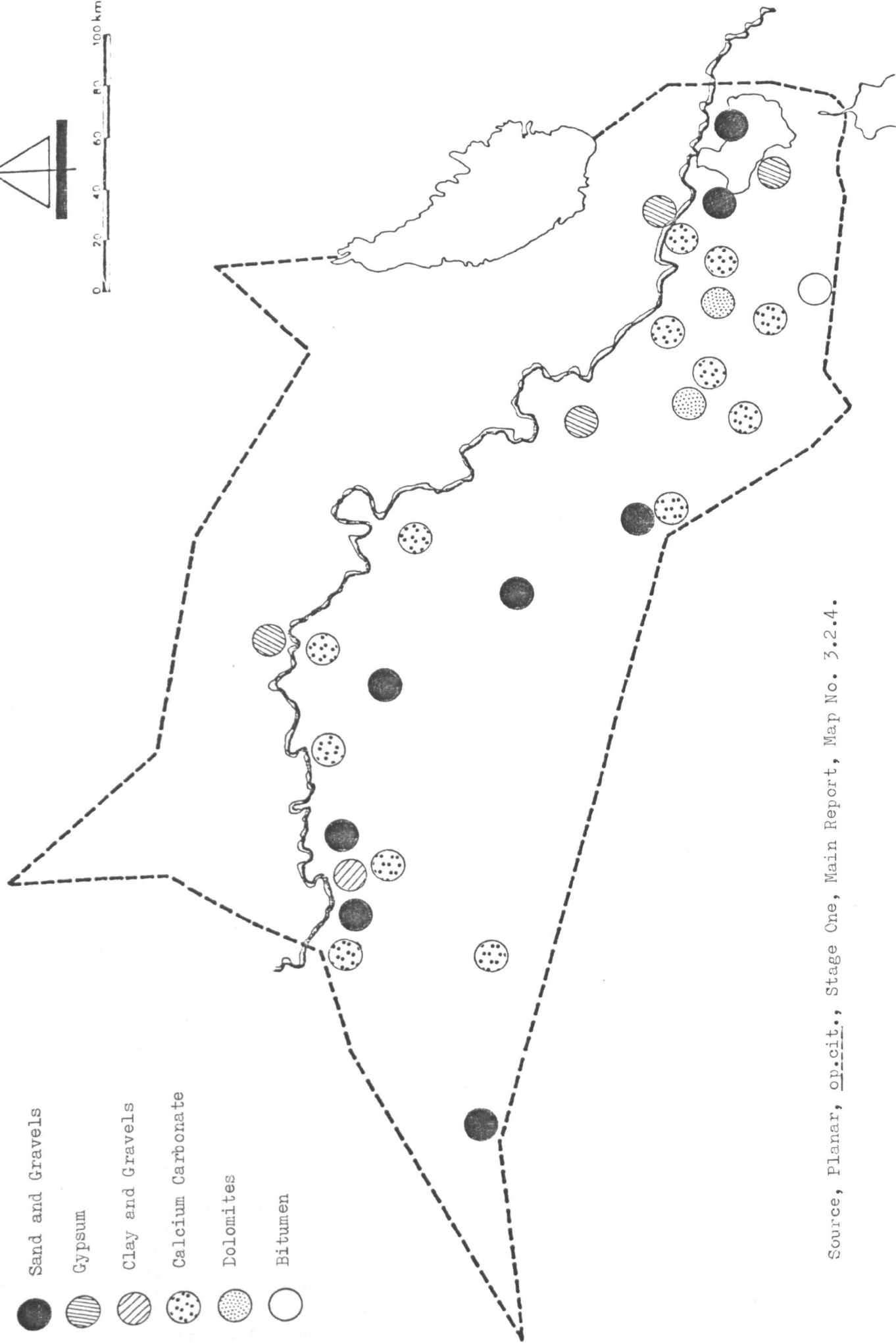
Excellent raw materials for ceramic and refractory industries are found in the Ga'ara depression to the South of the Euphrates valley e.g. in Duekhla and Samhat.

The Ga'ara clays are located on the Southern borders of the Ga'ara depression about 65 km. from Rutba. The basic raw materials for making bricks are generally attainable in the Euphrates valley. Gypsum and anhydrite are important raw materials of the building industry. Gypsum blocks are used for building. Gypsum is also burned in Kilns to form "Juss" the major building agent used in construction in Iraq. The gypsum reserve is concentrated in the area near Hit. Recorded limestone quarries for construction purposes along the Euphrates valley are found at Husaiba, Raw, Ana, Haditha, Khan Baghdadi, Hit, Kubaisa, Abusfia, Kilo 45 and Kilo 60. As for the main quarries of fine (sand) and coarse (gravel) aggregate the following sites are the major known areas: Habhaniya, Wadi Hauran, Karabla, Bauan and Muhamadiyah. Sand stones are also used as building materials e.g. Hauran Sandstone. However this

Mineral Occurrences in the U.E.R.



- Sand and Gravels
- ◐ Gypsum
- ◑ Clay and Gravels
- ◒ Calcium Carbonate
- ◓ Dolomites
- Bitumen



Source, Planar, op.cit., Stage One, Main Report, Map No. 3.2.4.

material has not yet been estimated or exploited for building purposes.

Finally, Bitumen is found in the localities of Hit, Abu Jir and Ain Jabha reserves.

6.2. Area and Administrative Divisions

The U.E.R. covers about 30976 sq.km.⁽¹⁾ that is about 37% of the area of Anbar Muhafadah, and 7.1% of the total area of the country. With a total population of 298235 inhabitants in 1977, the gross density is about 9.6 persons/sq.km., about 1/3 that of the country.

Administratively, the region consists of five Qadhas, with Ramadi as a regional capital. It contains all Qadhas of Anbar Muhafadah except Faluja and Rutba. The first one, according to the delineation of Ministry of Planning (Physical Planning Commission) is part of Baghdad Metropolitan Region, while the latter is regarded as part of the Western Desert Region. However, there is a mutual relationship between these two Qadhas and the U.E.R. whether administratively, as part of Anbar Muhafadah, or economically through the functional relationship. A very clear example of the economic relationship is that, although phosphate deposits are concentrated outside the region, the manufacturing process of these deposits is mainly within the study area.


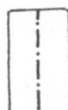
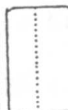
In addition to the five Qadhas, the region consists of ten Nahiyas distributed unevenly among the five Qadhas (See map (6.5)). The above stated administrative structure brings the number of urban centres in the region to sixteen.⁽²⁾

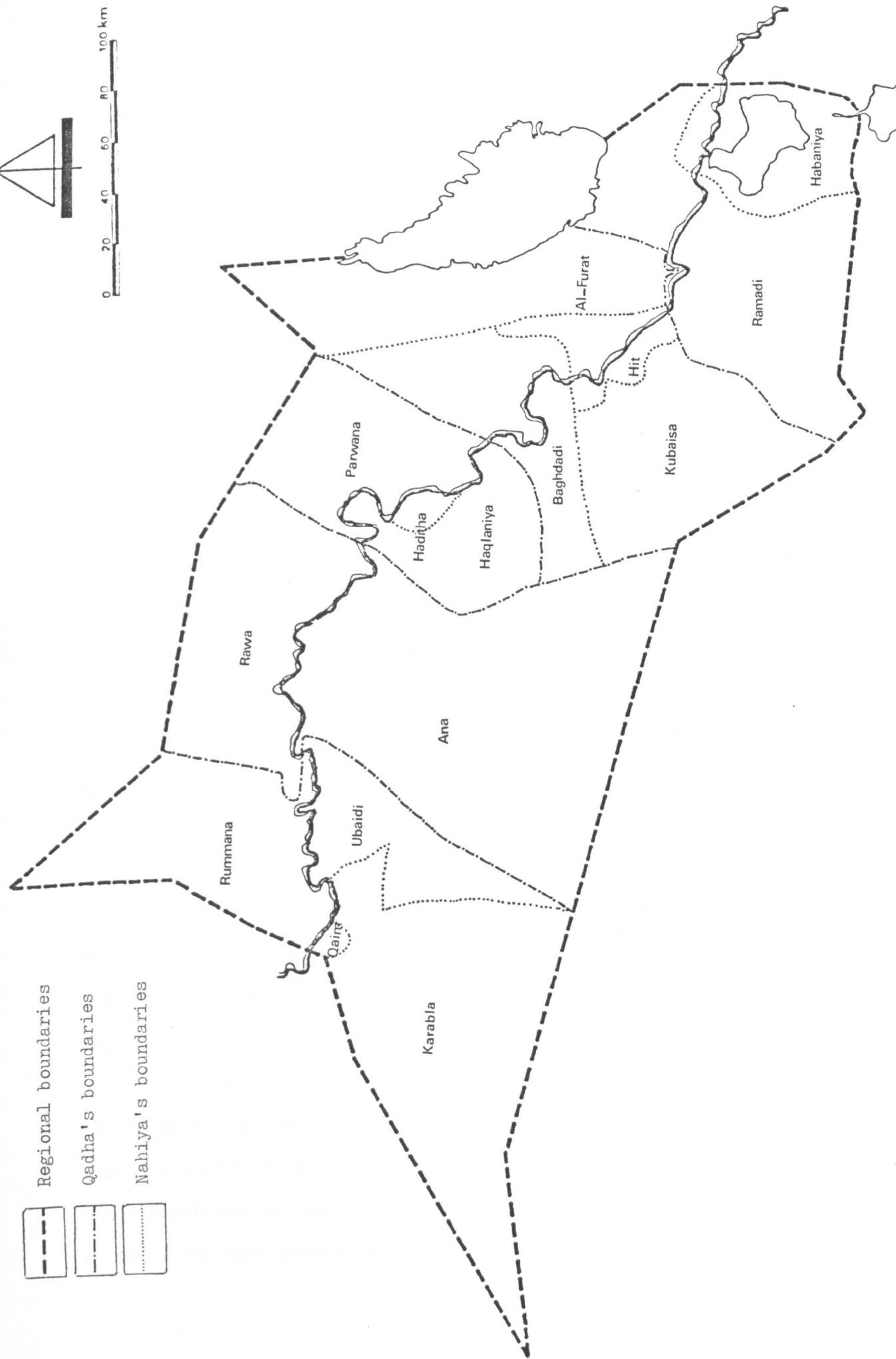
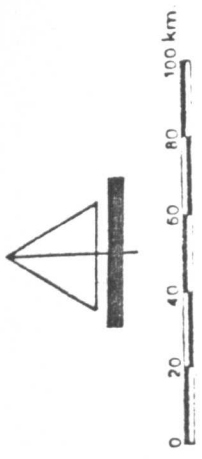
(1) Planar, op.cit., Stage One, Main Report, 1978, P.25.

(2) Urban Centre in Iraq is defined as "Any habitation containing a minimum of 2000 inhabitants or any place which may be declared as administrative centre and/or has been declared as a "municipal area" (S.S.Shafi Urban Planning in Iraq, Ministry of Municipalities, Baghdad, 1972, footnote No. 6, P.7.).

The above definition may not give a real picture of urbanisation in Iraq and the region since, "urbanism is a specific human behaviour attitude, a non-agricultural pattern of working and living, rather than an administrative status of Place." (Rasool F. Al-Jabiri, op.cit., P.171). Thus using administrative criterion to define an urban centre is rather confusing. Both human behaviour and employment within many municipal boundaries are often essentially rural. Nevertheless, in the absence of a more precise definition drawn from accurate data and scientific research, it would seem that using the administrative criterion is, at least temporarily, justified.

Administrative Divisions of the U.E.R.

-  Regional boundaries
-  Qadha's boundaries
-  Nahiya's boundaries



6.3. Population Growth, Distribution and Urbanisation Pattern

6.3.1. Population Growth

It has already been pointed out that, the U.E.R. is very thinly populated. This is true both in terms of area and the economic potentialities which it contain. These, among other factors, were an important impulse to concentrate development in this area in the recent years, in an attempt to decentralise development and take overspill from Baghdad, especially since the region and its capital city Ramadi is within about 110 km. from Baghdad Metropolis.

The total population of the region increased from 116571 to 298235 inhabitants during the period 1947-1977, (See table (6.1)), at a compound growth rate of 3.2% annually. The rate of growth was decreasing at an increasing rate from 1947 till 1970. It was about 3.6% for the period 1947-1957, decreased to about 2.2% and 0.3% per annum for the periods 1957-1965 and 1965-1970 respectively. The decreasing rate of growth of population coincided with the findings of the previous analysis of the spatial distribution of development, which showed that Anbar Muhafadah was among the depressed areas of the country, making it one of the leading contributing areas of migration to Baghdad. It came in the second place, within Iraqi Muhafadahs in 1965, with a net population loss of 79289 persons and in the fourth place in 1973, with a net loss of 71400 persons (see table (5.2)). The proximity of the region from Baghdad Metropolitan Region which absorbed most of the development during this period, accelerated population movement to Baghdad. The Preliminary study of the region by the Regional Planning Department supports this view and show that the destination of the outmigrants from Anbar Muhafadah was mainly to Baghdad Metropolis. It found that about 93.8% of the outmigrants settled in Baghdad, coming in the second place

Table (6.1)

Population Growth of the U.E.R. by Urban and Rural Areas
for the period 1947 - 1977

	Urban			Rural			Total		
	Number	%	Annual Growth Rate	Number	%	Annual Growth Rate	Number	%	Annual Growth Rate
1947	26168	22.4	-	90403	77.6	-	116571	100	-
1957	41778	25.3	4.8	123593	74.7	3.2	165371	100	3.6
1965	78401	39.9	8.2	118135	60.1	-0.6	196536	100	2.2
1970	99481	49.8	4.9	100234	50.2	-3.3	199714	100	0.3
1977	179031	60.0	8.8	119198	40.0	2.6	298235	100	5.9

Sources, General Population Census, 1947, 1957, 1965, 1977 and Preliminary Estimation of 1970.

Diala Muhafadah with 2.9% and Basrah Muhafadah with 1.1%.⁽¹⁾

Since 1970 the situation has changed remarkably. The rate of growth started increasing and by 1977, the annual rate of growth reached 5.9% which is higher than the average rate of growth of the country as a whole by about 2.5%. This again reflects, as it has already been seen, in the previous chapter the special importance given to the region in the recent development plans, trying to transform it from a relatively depressed region to an economically active part of the country. Accordingly outmigration decreased and the 33434 persons which represented the net loss of population by Anbar Muhafadah (see Table 5.2)) seem to be from parts of Anbar Muhafadah other than those included within the U.E.R., that is Faluja and Rutba Qadhas. This fact has been confirmed by the results of 1977 population census which showed that out of 36840 in-migrants to Anbar Muhafadah 31611 went to the U.E.R.,⁽²⁾ that is

(1) Regional Planning Department, op.cit., P.44 and table(6),P.46.

(2) Planar, op.cit., Complementary Report of Stage One, 1979, P.6.

85.8% of the total.

As a general trend all over the country, urban population was growing at a rate of growth higher than the average rate of growth of population for all the mentioned periods. The growing pace of urbanisation was accompanied by a tremendous decline in the rural population. The result is that the urban population in the region is higher than the rural population. The percentage of urban population to the total population increased from 22.4% in 1947 to 60% in 1977. The annual rates of growth of the urban population were 4.8%, 8.2%, 4.9% and 8.8% for the successive periods of 1947-1977.

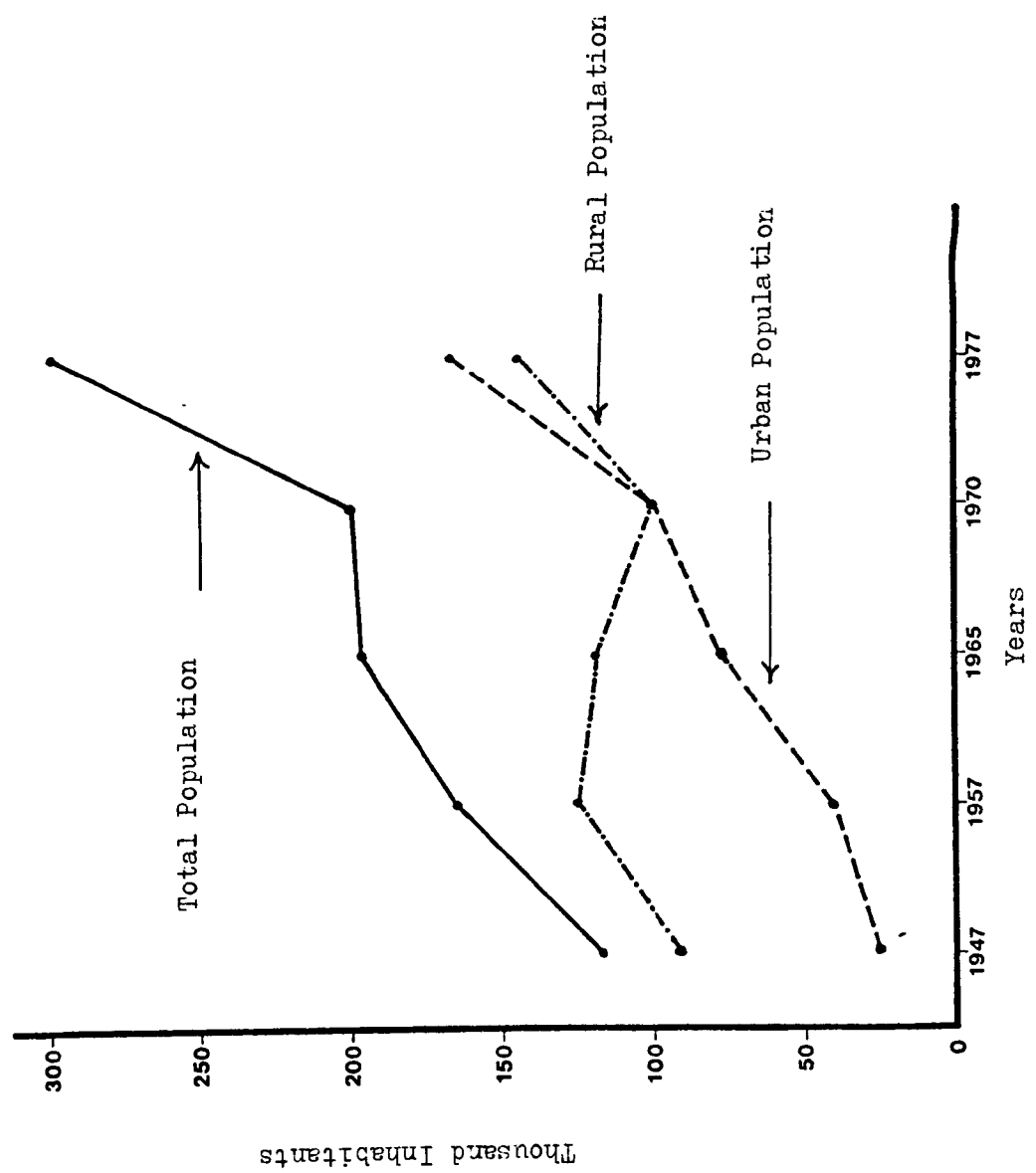
The situation in the rural areas of the region was quite different. The percentage of the rural population decreased rather slightly from 77.6% to 74.7% during the period 1947-1957, and then declined drastically to 40% during 1957-1977. The greatest decline was during the period 1965-1970, when the annual rate of growth was found to be (-3.3%) (see table (6.1)).

The differences in the rate of growth of urban and rural population is best illustrated in figure (6.1). The rapid decline in the rural population could be attributed; first, to the migration of rural settlers to urban areas whether they are within the region or outside the region and second, to creating new urban centres in the region from previously rural areas. The latter factor applies mainly for the periods 1957-1965 and 1970-1977, and justifies the very high increase of urban population rate of growth, especially during the period 1957-1965. Finally, it should be noted that, the natural growth of both urban and rural settlers in the study area is high. This was attributed to many reasons, among them are "social and economic impulses toward marrying young, the high rate of married male and female and the very limited practicing of birth control."⁽¹⁾

(1) Planar, op.cit., Stage One, Main Report, P.38 and Appendices, PP.A4-A5.

Figure (6.1)

Population Growth by Environment for the Years:
1947, 1957, 1965, 1970 and 1977



6.3.2. Spatial Distribution of Population

The population of the U.E.R. tends to be concentrated in some parts of the region, rather than others. This trend of concentration has continued since 1947. Details in table (6.2) show that Ramadi Qadha contained more than half the total population of the region. Of the 116571 inhabitants in 1947, Ramadi Qadha was the most heavily populated of the other parts of the region with 55% of the total population. Its share increased to about 60% in 1977. The share of other Qadhas from the total population shows to be changing and in two out of four cases there was no clear trend of population changes over the mentioned period. For instance, Hit Qadha contained about 17% of the total population in 1947. Its relative importance decreased to about 15% in both 1957 and 1965 and increased slightly to 16% in 1970 then decreased again to about 13% in 1977. The same pattern of population change has been experienced in Haditha Qadha. The only Qadha which continued to experience a gain in its population share was Qain, where its share increased from 6.7% in 1947 to 10.2% in 1957 and 1965 and to 11.9% in 1970, with a slight decrease in 1977, to 11.4%. On the contrary, the relative importance of Ana Qadha was always decreasing. It decreased from about 10% in 1947 to about 6% in 1977.

The spatial distribution of in-migrants to the study area coincides with the trend of population growth. The U.E.R. study depending on 1977 in-migration data (the only data available on Muhafadhs level) showed that "65.3% of the total in-migrants to the region for different groups⁽¹⁾ settled in Ramadi Qadha. In the second place came Qain Qadha with 14.4%.

(1) The study distinguished between three groups of in-migrants, that is, in-migrants for more than 7 years, 3-7 years and less than three years. Planar, op.cit., Complementary Report of Stage One, P.3.

Table (6.2)
Spatial Distribution of Population for the Years: 1947, 1957, 1965, 1970 and 1977

Area	1947						1957						1965						1970						1977					
	Urban		Rural		Total		Urban		Rural		Total		Urban		Rural		Total		Urban		Rural		Total		Urban		Rural		Total	
	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Ranadi Qadha	9797	37.4	54488	60.3	64285	55.1	17826	42.7	72258	59.3	91084	55.1	45995	56.7	62773	53.1	108768	55.3	48777	49.0	57092	57.0	105869	53.0	112269	62.7	66489	55.8	178758	59.9
Hit Qadha	4830	18.5	14648	16.2	19478	16.7	6901	16.5	17214	13.9	24115	14.6	8881	11.3	19911	16.5	28792	14.7	14728	14.8	17850	17.8	32578	16.3	20538	11.5	19230	16.1	39768	13.3
Harliha Qadha	5425	20.7	8226	9.1	13651	11.7	4361	10.4	13228	10.7	17589	10.6	9550	12.2	14310	12.1	23860	12.1	16054	16.2	6347	6.3	22401	11.2	19184	10.7	9042	7.6	28226	9.5
Ann Qadha	5842	22.3	5536	6.1	11378	9.8	11135	26.7	4594	3.7	15729	9.5	10761	13.7	4322	3.7	15083	7.7	11739	11.8	3471	3.5	15210	7.6	11867	6.6	5655	4.7	17522	5.9
Qaim Qadha	274	1.1	7505	8.3	7779	6.7	1555	3.7	15299	12.4	16854	10.2	3214	4.1	16819	14.2	20033	10.2	8182	8.2	15474	15.4	23656	11.9	15179	8.5	18782	15.8	33961	11.4
Total U.E.R.	26169	100	90403	100	116571	100	41778	100	123593	100	165371	100	78401	100	118135	100	196536	100	99480	100	100234	100	199714	100	179037	100	119198	100	298235	100

Sources, The years 1947, 1957, 1960 and 1970 derived from, Regional Planning Department, g.c.e.i.t., PP.35-39.
 The year 1977 derived from the results of 1977 Population Census.

The share of other Qadhas was almost the same. 5.6% for Hit, 7.6% for Haditha and 7.1% for Ana."⁽¹⁾ Taking the most recent in-migrants only, the study showed that 71.4% of the in-migrants settled in Ramadi, 11.7% in Qain, 5.5% in Hit, 6.2% in Haditha and 5.3% in Ana.⁽²⁾

The unstable changes in the pattern of growth and distribution of the Upper Euphrates Region population could reflect mainly, the weak economic base of the region over the period. On the other hand, the spatial distribution of in-migrants to the region reflects the relative economic importance of each Qadha and the size of investment allocated to each one.

Urban population growth seems to be an important factor in intensifying the population concentration trend in the region. The phenomenon of urban population concentration was very high and intensified over time. In 1947, only 37.4% of the total urban population were concentrated in Ramadi Qadha, coming in the next place Ana with 22.3%, Haditha with 20.7%, Hit with 18.5%, and Qaim with only 1.1%. By 1977, the situation changed drastically. Ramadi Qadha contained about 63% of the total urban population, coming in the next place Hit Qadha with 11.5%, Haditha with 10.7% and Ana with only 6.6%. Qaim Qadha contained 8.5% of the total urban population, reflecting the highest rate of growth during the whole period. Its urban population growth was as high as 5 times that of Ramadi Qadha. However, Ramadi Qadha, with few exceptions had the greater attraction power for migrants and grew at a much higher rate than other Qadhas. This greater attraction power, as it will be seen later was due mainly to the existence of Ramadi City as an administrative centre and a main service centre in the region, as well as Anbar Muhafadah,

(1) Ibid, P.3.

(2) Ibid, P.4.

with a relatively better and more diversified economic base. The exceptions mentioned earlier include Ana, for the period 1947-1957 and Qaim, for the whole period. The high rate of growth of Ana urban population for the mentioned period was due not to economic factors but rather to the creation of Rawa as an urban centre in 1957. The high rate of growth of urban population of Qaim Qadha was due to many factors among them are, the creation of new urban centres, Ubaidi and Karabla in 1977⁽¹⁾, the implementation of a very large industrial project in the area (Qaim phosphate complex) which enhanced its economy and attracted the necessary labour force for its implementation. In addition to the fact that Qaim is a border town which added impetus to its growth. These impetus are represented by the existence of some activities associated with many border towns such as the passport office, custom office and so forth. Finally the size of population in the base year (1947) was very small, hence any absolute increase will effect highly the relative rate of growth.

6.3.3. Urban Size and Spatial Distribution of Urban Areas

The urban population of the U.E.R., not only tends to concentrate in urban areas of one Qadha, but more seriously, the trend of urban population to concentrate in one city. In 1957, 44.7% of the total urban population were living in Ramadi City, a figure which decreased to about 37% in both 1965 and 1970. This high reduction in the relative importance of Ramadi City was due mainly to the creation of new urban areas at these

(1) Table (6.3) illustrate, among other things, the effects of creation of new urban centres on urban population growth since 1957. This could be shown by grouping the urban centres related to each Qadha. Ramadi Qadha include, Ramadi City and Habbaniya town; Hit Qadha, include Hit, Kubiassa, and Baghdadi towns; Hadiitha Qadha include, Hadiitha, Haqlaniya and Parwana towns; Ana Qadha include Ana and Rawa towns and Qaim Qadha include, Qaim, Karabla and Ubaidi towns.

Table (6.3)

City-Sizes and Distribution Pattern

City or Town	1957					1965					1970					1977									
	Actual Size	% of the largest City	Rank	Hypothetical Size	% of the largest City	Actual Size	% of the largest City	Rank	Hypothetical Size	% of the largest City	Actual Size	% of the largest City	Rank	Hypothetical Size	% of the largest City	Actual Size	% of the largest City	Rank	Hypothetical Size	% of the largest City	Actual Size	% of the largest City	Rank	Hypothetical Size	% of the largest City
Hamadi	17826	100	1	17826	100	29265	100	1	29265	100	37674	100	1	37674	100	91909	100	1	91909	100	91909	100	1	91909	100
Habaniya	-	-	-	-	-	16730	57.2	2	14633	50	11103	29.5	2	18837	50	20360	22.2	2	45955	50	20360	22.2	2	45955	50
Hait	6901	38.7	2	8913	50	8981	30.3	3	9755	33.3	10543	28.0	3	12558	33.3	14884	16.2	3	30636	33.3	14884	16.2	3	30636	33.3
Hadiitha	4361	24.5	5	3565	20	6849	23.4	4	7316	25.0	10066	26.7	4	9419	25.0	12217	13.3	4	22977	25.0	12217	13.3	4	22977	25.0
Qaim	1555	8.7	6	2971	16.7	3214	11.0	7	4181	14.3	8182	21.7	5	7535	20.0	11723	12.8	5	18382	20.0	11723	12.8	5	18382	20.0
Ana	6117	34.3	3	5942	33.3	5620	19.2	5	5853	20.0	6768	18.0	6	6279	16.7	6734	7.3	6	15318	16.7	6734	7.3	6	15318	16.7
Rava	5018	28.1	4	4457	25	5141	17.6	6	4878	16.7	4971	13.2	7	5382	14.3	5133	5.6	7	13130	14.3	5133	5.6	7	13130	14.3
Haqlaniya	-	-	-	-	-	-	-	-	-	-	3288	8.7	9	4186	11.1	4517	4.9	8	11489	12.5	4517	4.9	8	11489	12.5
Kubaisa	-	-	-	-	-	-	-	-	-	-	4185	11.1	8	4709	12.5	4281	4.7	9	10212	11.1	4281	4.7	9	10212	11.1
Karabla	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3041	3.3	10	9191	10.0	3041	3.3	10	9191	10.0
Parwana	-	-	-	-	-	2701	9.2	8	3658	12.5	2700	7.2	10	3767	10.0	2450	2.7	11	8355	9.1	2450	2.7	11	8355	9.1
Daqhdaji	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1373	1.5	12	7659	8.3	1373	1.5	12	7659	8.3
Utaldi	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	415	0.5	13	7070	7.7	415	0.5	13	7070	7.7

Sources, As in table (6.2)

periods. However, the annual rate of growth of its population experienced a relative decline. It was 6.4% for the period 1957-1965, declined to 5.2% for the period 1965-1970. By 1977, slightly over 51% of the study area urban population were concentrated in Ramadi City. The city experienced the highest rate of growth which went up to 13.6% per annum for the period 1970-1977. Ramadi's position as the administrative centre or capital of Anbar Muhafadah (with all departments and institutions that goes together with this position) was clearly an important factor in its rapid growth in addition to the establishment of the very large glass industry project in the late 1960's.

Such a pattern of growth brought into existence two main characteristics of the city-size distribution in the region.⁽¹⁾ The first characteristic is the appearance of the phenomenon of one major predominant city over the whole urban system and the second is the wide deviation, in recent years, of the existing pattern of city-size distribution from the hypothetical pattern.

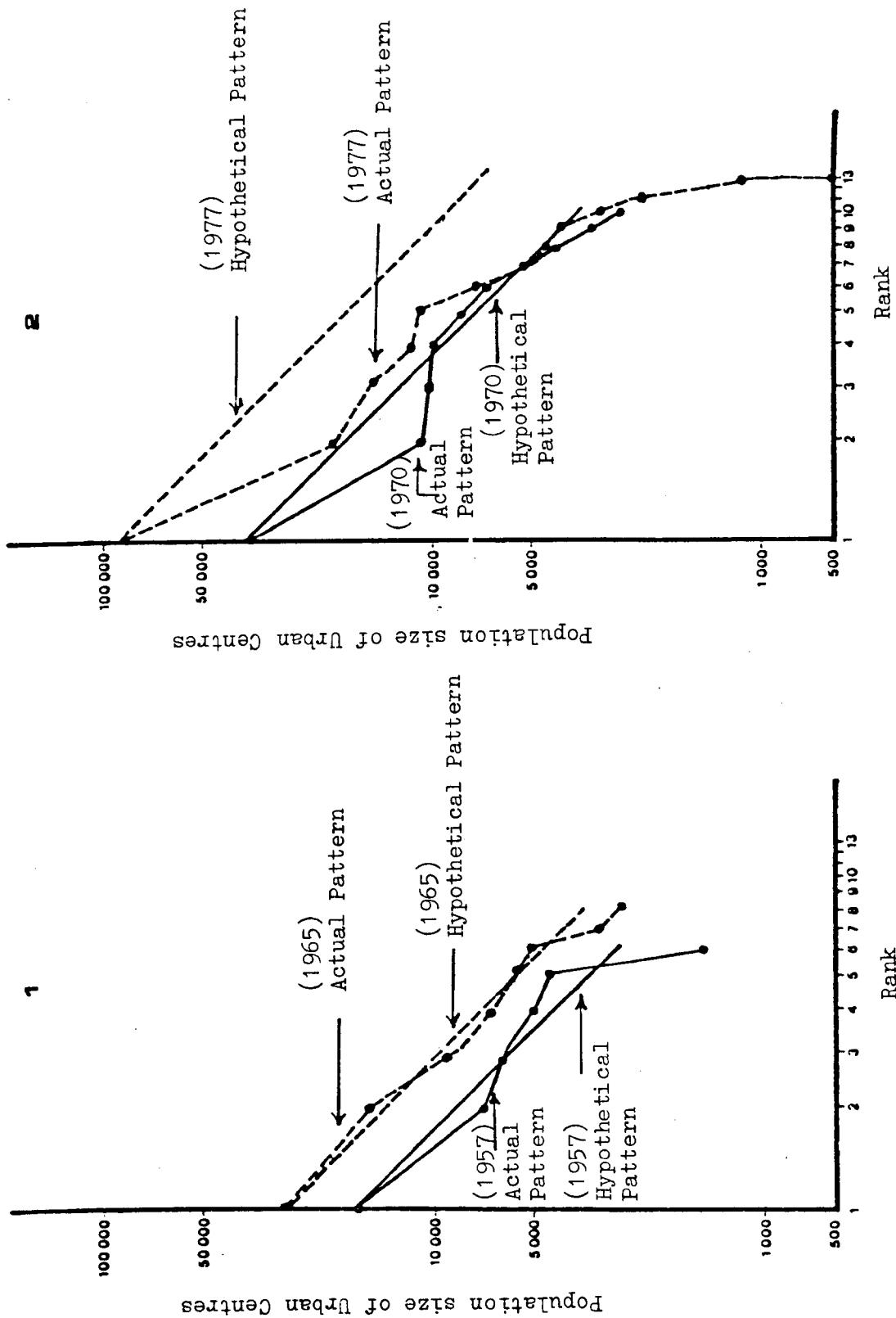
For the first time, in 1970, the predominancy phenomenon was very apparent in the region. At that year, the second settlement (Habbaniya) was about 29.5% the size of the largest city (see table (6.3)). In 1977, its size declined to about 22% the size of the largest city.

The distribution pattern of the city-size in the region shows, in the recent years, a wide deviation from the hypothetical pattern (see figure 6.2). The relatively most balanced distribution pattern occurred in 1965 prior to the emergence of predominancy phenomenon. The size of the second settlement was less than half that of the largest one, and

(1) The city size distribution pattern in the region is examined, for as it has been found in part one of this study the distances between all cities and their closest neighbours, as well as their distances from the biggest centres of economic activity, influences the degree of economic integration of the cities within the regional and national economy and hence the level of external economies and/or diseconomies that the economic units in a particular city enjoy. Hence the examination of the existing city-size distribution pattern of the region will explore the deficiencies of the existing pattern and provides the basis for improving it, when building the urban growth strategies for the region, to serve better the regional and consequently the national economy.

Figure (6.2)

City-Size Distribution in the U.E.R. for the Years: 1957, 1965, 1970 and 1977



the actual distribution pattern was very smooth, especially in the middle tail of the distribution curve (see figure (6.2.1)). In 1970, except for the upper tail of the curve, the distribution was smooth and very close to the hypothetical curve, with three urban centres above the latter curve. The sharpest deviation was evident for the small size settlements (less than four thousand inhabitants), which are mostly recently created (see figure (6.2.2)).

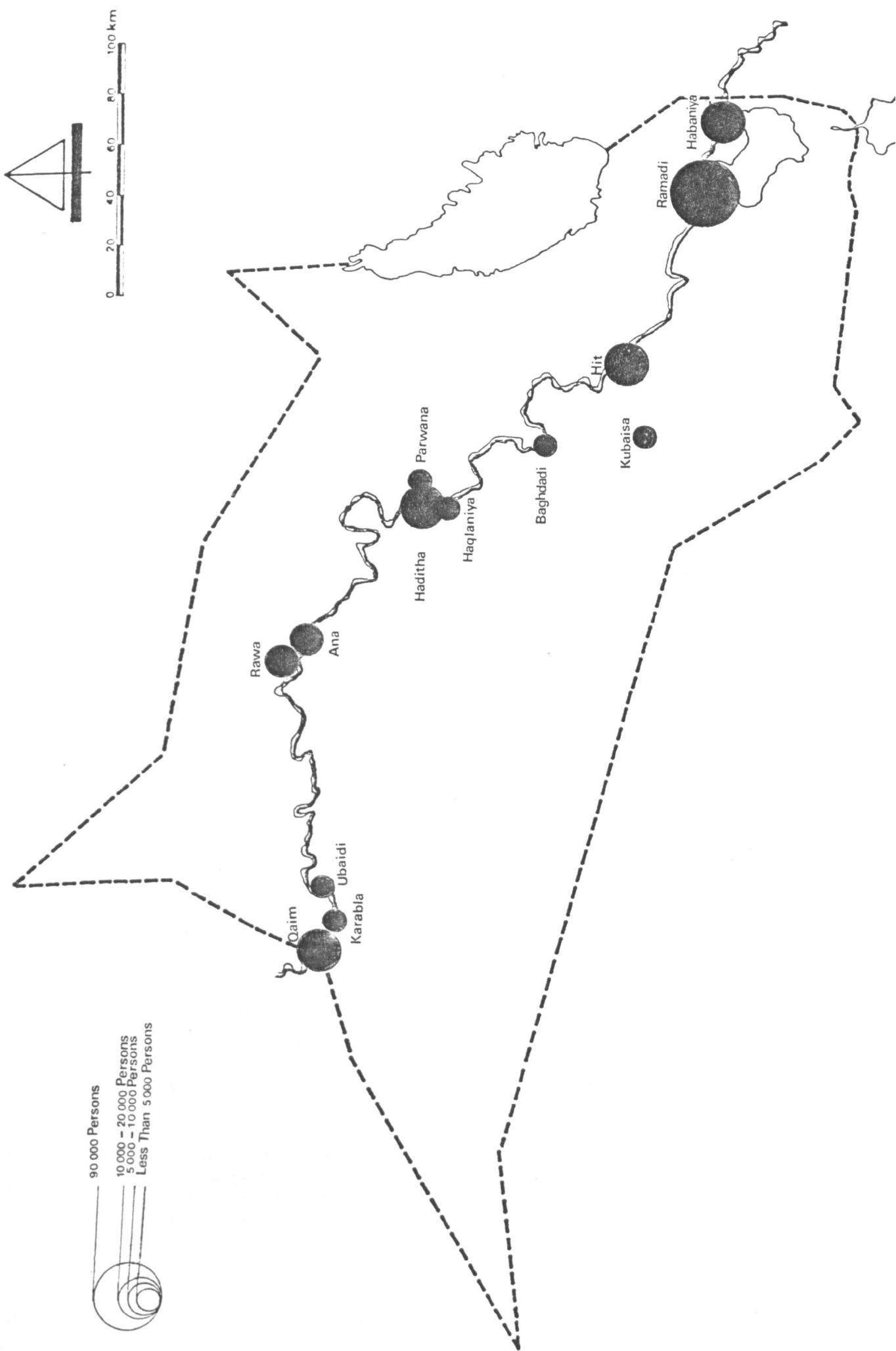
The physical characteristics of the U.E.R. played an important role in shaping the pattern of distribution of the urban centres. It is arguable that in any region with one river, with very scarce fertile lands stretching along it in a very narrow strip (in most cases not more than 300-500 metres wide) and with all other land desert, then the cities and their hinterlands will become established and grow linearly along the river. This is exactly the pattern of distribution of urban centres in this region. Only one of the 13 urban centres in the region was established away from the river corridor, that is, Kubiassa town which was created as an urban settlement in the late 1960's to serve the building materials quarrying in the area.

Knowing that the distance between Ramadi and Qaim, the town exactly at the other end of the study area on the Iraqi/Syrian borders, is about 320 km. one can visualise the huge shortage of urban population in this long ribbon and the unbalanced spacing of urban centres within the urban hierarchy which is characterised by (see map 6.6):-

1. the existence of a central city (around 92000 inhabitants in 1977) at one end of the study area and 11 urban centres, located to the west of it, along the Euphrates River.

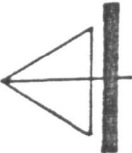
2. the second group of urban centres represented by towns between 10000 and 20000 inhabitants. According to the 1977 census there were four, Habbaniya, Hit, Haditha and Qaim (see table (6.3)). They were

Distribution of Urban Population of the U.E.R. by Urban Size According to the Year 1977



90 000 Persons
10 000 - 20 000 Persons
5 000 - 10 000 Persons
Less Than 5 000 Persons

0 20 40 60 80 100 km



within 20, 70, 160 and 320 km. from Ramadi City. It should be noted that all the towns within this group are administratively of second order (Qadha), except Habbaniya which is of the third order (Nahiya).

3. the third group of urban centres, with between 5000 - 10000 inhabitants consisting of Ana and Rawa towns located within 230 and 240 km. from the central city respectively. Ana will be completely flooded as a result of the reservoir that will be created after the completion of Haditha dam.⁽¹⁾ 2/3 of Rawa (the lower parts of it) also will be flooded.

4. the fourth group of urban centres, with less than 5 thousands inhabitants consist of 6 urban centres, they are: Haqlaniya, Kubiya, Karabla, Parwana, Baghdadi and Ubaidi. Haqlaniya and Kubiya each with about 2.5% of the total urban population and the others with less than 2% each. This group of urban centres are characterised by first, they are administratively of the third order (Nahiya), second, they are very close to their related Qadhas centres and three, despite being considered urban centres according to the administrative criterion adopted in Iraq, agricultural activities dominate all other activities in these centres.

Hence, it could be concluded that the system of urban hierarchy in the region characterise by primacy and unbalanced spacing of urban centres.

6.3.4. Other Demographic Characteristics

Beside the importance of studying the growth, distribution of population, urbanisation pattern and city-size distribution, many other demographic factors are of equal importance in regional planning,

(1) Establishment of Haditha Dam was the main reason behind the absolute decline of Ana's population and the very low rate of growth of Rawa's population (this subject will be dealt with later in this chapter).

especially if the problem under investigation is concerned with urbanisation strategies and the urban size distribution, as it is the interest of this work. Hence, some important demographic characteristics of the region, other than those *already discussed*, will be presented briefly as follows:-

1. Urban and rural fertility and mortality rates:⁽¹⁾ official statistical sources indicate that, there are large differences between urban and rural fertility rates listed at 39.6 per 1000 and 47.0 per 1000 respectively.⁽²⁾ This data indicates a considerable reduction taking place in urban areas and particularly in the large cities. This is attributed to higher marriage ages to allow for higher education and getting established in work, and also to the increased use of birth control techniques.

Death rates, as a whole, have also dropped considerably for Iraq from more than 22 per 1000 between 1950-1955 to 14.6 per 1000 between 1970-1975.⁽³⁾ Official statistical sources list the crude death rate at 9.1 and 12.8 per 1000 for urban and rural population respectively, and infant death rates at 76.3 and 104.5 per 1000 for urban and rural population.⁽⁴⁾

2. Marital status; Marital ratios are very high among male and female of the U.E.R. More than 2/3 of the adult population (15 years and over) are married, coupled with a very low level of unmarried men and women.⁽⁵⁾

(1) Data on country's level will be used here, due to the absence of such data on Muhafadaks level.

(2) Central Statistical Organisation, Annual Abstract of Statistics, 1977, op.cit., P.37.

(3) U.N., World Population Prospects, U.N., New York, 1977, P.114. Iraq data is used here due to the absence of death rates on Muhafadah level.

(4) Central Statistical Organisation, Annual Abstract of Statistics, 1977, op.cit., P.37.

(5) Planar, op.cit., Stage One, Appendices, P.A6.

The very low level of divorce indicates that family life is very settled in the area, and that social custom encourages this situation and consequently discourages divorce. Only 1.9% of the country's total divorce cases were registered in Anbar Muhafadah in 1977.⁽¹⁾

3. Sex Composition: In general the ratio of males to every 100 female in Iraq is between 100 and 105. In the study area, sex composition is significantly different. In 1977, it was about 115. It increases in the urban areas to about 123 and decreases in the rural areas to about 105. Variations between different urban areas of the region is very high, while it is found to be 99.5 in Ana Qadha, it increased to 105 in Qaim Qadha and to a very high level of about 138 in Ramadi Qadha.⁽²⁾ Increasing the ratio of male over female in Ramadi Qadha to such a high level reflects again the relatively strong economic base of the Qadha, especially Ramadi City which attract at the first stages of development the male until they settle and insure their living they bring their families. The same justification applies in case of Qaim Qadha, as a result of the implementation of phosphate industry in the area, which led even to the increase of the sex composition of its rural areas to about 116.⁽³⁾

4. Age Composition: As a general trend in the country, population structure is biased towards the young. The percentage of population 14 years and less is even higher than that of the country. It was according to 1977 population census about 50.7% of the total population, with a remarkable difference between urban and rural areas. The

(1) Central Statistical Organisation, Annual Abstract of Statistics, 1977, op.cit., P.39.

(2) Planar, op.cit., Stage One, Appendices, Table (A.4.1), P.A11.

(3) Ibid, Table (A.4.1), P.A11.

percentage of this age group in urban areas was about 48%, while it showed to be about 54% in rural areas. Contrary to this, is a lower percentage of working age group at about 43% with a very high differences between urban and rural areas of the region. The percentage of active age group in urban areas was about 46% while that of the rural areas was about 38.2%.⁽¹⁾ The above figures support the previous analysis, that the study area is characterised by a high fertility rate in rural areas and the migration of people of the active age group to urban areas, where they can find better job opportunities and higher standard of living.

The dependency ratio which consists basically of the ratio between dependent population and population of working age is high. It is about 132.6 per 100 working people with high differences between urban and rural ratios (116.9 in urban areas and 161.8 in rural areas). In general the ratio is very high compared to that of the developed countries which is about 79 per 100 working people.⁽²⁾ Clearly, from the economic point of view the lower the dependency ratio the better, but on the other hand high dependency ratio means that there is a potential labour force for any future development. The latter point is of great importance in case of Iraq in general and the U.E.R., in particular, where this high percentage of dependent people will enter the labour market successively through time and consequently participate in meeting the increasing demand for them as a result of intensive economic development taking place in the study area.

5. Household Size: Average household size is very high in Anbar Muhafadah. According to 1977 census, the average household size was

(1) Central Statistical Organisation, 1977 Population Census Results, Anbar Muhafadah, Baghdad, 1978, Table No. 23, P.25.

(2) Planar, op.cit., Stage One, Appendices, P.A.14.

8.0 persons, with very slight differences between urban and rural areas (7.8 and 8.0 persons respectively). Continuous improvements in the health standards, a high fertility rate and the continuing extended family household system were the main factors behind such a high average size.

6.4. Economic Base and Potentials of the Study Area

6.4.1. Economic Development Indicators

In general, the U.E.R. was one of the relatively depressed areas in the country until the beginning of the 1970's. Between 1947-1957, there was an economic expansion in the region due to the implementation of the oil pipe line from Kirkuk to Hayfa and Habbaniya irrigation projects.⁽¹⁾ Between 1957-1965, the region was depressed due to the low central investment channelled to it, as a result of the prevailing strategy of over-concentration of development in the capital Baghdad. Since 1965, the relative importance given to the region has increased. Table (5.11) indicates that the National Development Plan 1965-1969 channelled about 6.6% of its total investments to Anbar Muhafadah. (It is expected that most of these investments went to the study area) coming in fourth place among fourteen Muhafadahs at that time and getting twice the proportion of investment as its population. About 33% of the 28.7 million I.D. (the total investment channelled to Anbar Muhafadah) have been allocated to the agriculture sector, 31.4% to the industrial sector and the rest to the building and service sector.

The National Development Plan 1970-1974 continued to place a great emphasise on Anbar Muhafadah. It came second after Baghdad, as far as the per capita investment for the whole period was concerned. The

(1) Planar, op.cit., Stage One, Main Report, PP.47-49.

increased emphasise placed on this Muhafadah intensified in the next national development plan. 943.6 million I.D. of the National Development Plan 1976-1980 have been channelled to Anbar Muhafadah, representing 9.9% of the total investment. This very high percentage of investment moved Anbar Muhafadah up to third place, as far as the total investment is concerned and to first place if the per capita investment is taken into consideration. The per capita investment went up to about 2025 I.D. while that of Baghdad was about 619 I.D. and that of Basrah 2007 I.D. 47.5% of these investments have been allocated to the industrial sector. The transportation sector came in the second place with 34.1%. Only 10.2% and 8.2% of the total investments have been directed to the agriculture and the building and service sectors respectively.

Since allocation of investment in the industrial and the agricultural sectors, in recent national development plans are in accordance to the development potentialities of different Muhafadahs then, the above pattern of distribution of investments could indicate that the regional agricultural potentialities are very limited, whilst industrial development potentialities are very high. The very high industrial potentialities and the very limited agricultural ones will be examined later in this chapter when dealing with the land use pattern in the region. The low share of the building and service sector could be attributed to the low population density in Anbar Muhafadah as a whole, while the high share of the transportation and communication sector could be due to the vast areas of the region and its location as a connector of Iraq with other Arab countries and the Mediterranean sea ports.

Such a dramatic change in the relative importance given to the region could illustrate the change in the situation of the area from being one experiencing a net population loss for a long period to a pull area of the labour force from other parts of the country and could give an answer to the rapid growth of population, especially urban population in the recent years.

Despite the above development of investment, until 1977 the economy of the region was characterised by the dominance of the service sector. Table (6.4) shows that in 1977, out of 68800 employees, the total labour force in the region, some 44.8% were engaged in the service sector generating 43.5% of the total value added. 20.9% of the total labour force were engaged in the agricultural sector, producing only 2.8% of the total value added. The manufacturing industries contain only 4.4% of the labour force and generating the same percentage of value added. The effect of the rapid development of the industrial sector have not yet begun and most of the industrial projects, as it will be seen later, were under construction. This is confirmed by the high percentage of the labour force engaged in the construction sector, which was about 17.3% of the total and generated 31.7% of the total value added in that year.

The above structure of the labour force indicates clearly that development of the services trade and public utilities sectors were the main factor behind the rapid rate of urbanisation in the study area, with limited effects caused by industrial development.

A comparison between the economic structure of the region and the country as a whole shows, the decline in the relative importance of the agriculture and the industrial sectors in the study area, in terms of

Labour Force and Value Added of the E.U.R. and Iraq by Economic Sectors, according to 1977

Sector	U.E.R.			IRAQ		
	Labour Force		Value Added	% of Labour Force	% of Value Added	% of Value Added (without oil sector and Mining and Quarrying)
	No. (000's)	%	Value (000's I.D.)			
Agriculture	14.4	20.9	1874.0	31.5	7.6	16.7
Mining and Quarrying	1.9	2.8	3018.5	1.3	54.0	-
Manufacturing Industries	3.0	4.4	3036.4	9.5	7.1	15.6
Construction	11.9	17.3	21608.5	10.7	7.7	17.0
Electricity, Water and Gas	0.4	0.6	523.4	0.8	0.5	1.2
Transportation and Communication	2.7	3.9	3260.4	7.4)		
Wholesale and Retail Trade	3.2	4.6	1992.6	5.9)	12.7	27.7
Banking, Insurance and Real Estate	0.5	0.7	2190.2	1.0)		
Services	30.8	44.8	29617.8	31.9	10.4	21.8
Grand total	68.8	100.0	68121.8	100.0	100.0	100.0

Source, Planar, *op.cit.*, Final Report, Baghdad, 1979, Table (6.1), P.16.

employment and value added, against the rise of the relative importance of service and construction sector compared to that of the country (see table (6.4)).

Differences in the productivity of the labour force among different sectors of the economy of the region, on the one hand, and between that of the region and the whole country, on the other hand, are very apparent. In the region, for instance, 20.9% of the labour force in the agricultural sector generated only 2.8% of the total value added, whilst 0.5% of the labour forces in banking, insurance and real estate generated almost about 4.8% of the total value added. If productivity figures in the region are compared to that of the country one can find, for instance, that the productivity in the agricultural and the mining and quarrying sectors is lower in the region. In case of the mining and quarrying sector, 1.3% of the total labour force, in the country, generated 54.0% of the total valued added whilst 2.8% of the total labour force in the region generated only 4.4% of its total value added. This very high difference in productivity was due to the unavailability of oil in the study area which characterised by the very high productivity compared to other mining and quarrying activities. In case of the agriculture sector, 31.5% of the total labour force, in the country, generated 7.6% of the total value added if the mining and quarrying sector is included and 16.7% if the latter sector is excluded. In contrary, the productivity in the service sector, for instance, was higher in the region compared to that of the study area (see table (6.4)).

Finally, the activity rate⁽¹⁾ of the economically active population in the region was found to be lower than that of the country. According to the 1977 census it was found to be 23.1% compared to 25.5% in the case of the whole country.

6.4.2. Land Use Pattern of the U.E.R.

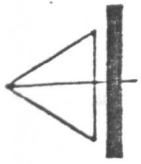
Until recently, the location of the natural resources had largely determined the pattern of land use in the U.E.R., with deliberate human effort, such as providing a well equipped infrastructure in specific areas rather than others, designating various types of land uses by regional zoning legislation or by encouraging (or discouraging) the allocation of certain economic activities to certain areas having little effect. However, "Such pattern of regional...land use is a common characteristics of all countries, and of less developed countries in particular, that have not adopted regional or town planning by which the pattern of land utilisation (more strictly, the location of economic activities) is imposed by the government, as in socialist countries, or indirectly led, as in capitalist countries (e.g. the stick and carrot policy in the U.K.)"⁽²⁾








Map (6.7) shows the various land uses in the study area which can be briefly listed as follows:-

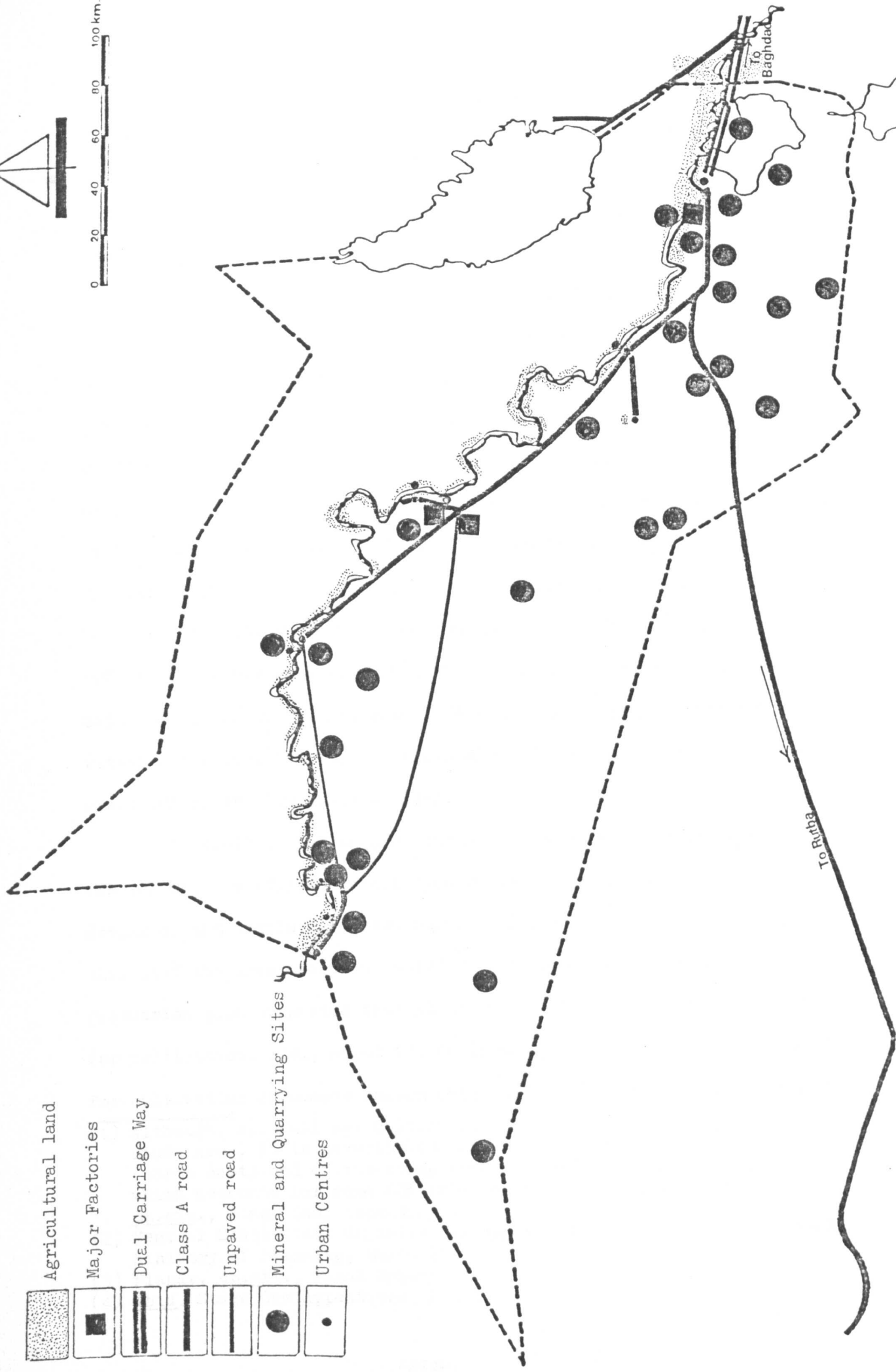
- Agriculture
- Mining and Quarrying
- Industry
- Transportation
- Unused land

(1) Several different definitions of activity rate are in use; it may mean the number of persons in a population who are in employment or seeking employment for every 100 persons in that population (see United Nations, Methods of Projecting the Economically Active Population, Manual V, New York, 1971, P.5 and A.H. Pollard et.al., op.cit., P.20). Here by activity rate it is meant the number of persons who are in employment for every 100 persons in the population of the region.

(2) Rasool F. Al-Jabiri, op.cit., PP.204-205.



-  Agricultural land
-  Major Factories
-  Dual Carriage Way
-  Class A road
-  Unpaved road
-  Mineral and Quarrying Sites
-  Urban Centres



Due to the important role played by most of these uses in shaping the existing pattern of both development and urbanisation processes in the region and the expected role to be played by each of them in the future perspective of these two phenomena, some details on each land use will be given as follows:-

(a) Agricultural Land use.

Shortage of existing agricultural land is a main characteristic of the land use of the region. As map (6.7) indicates, cultivable land is confined to a thin river basin strip widening out at both ends of the study area. According to the 1971 agricultural census (the only comprehensive agricultural survey in the country), the total arable land in the region was about 192052 donums of which about 80% is irrigated directly from the river basin, and the remaining areas are located outside the river basin and depend mainly on rainfall.⁽¹⁾ Almost about 50% of the arable land is within Ramadi Qadha. A further 18% within Qaim Qadha, 16% within Hit Qadha, 8% within Haditha Qadha and 10% within Ana Qadha.⁽²⁾ Thus, the two ends of the study area account for about 70% of the agricultural land.

As a result of the high migration trends from the rural areas of the region, the official statistics showed that, in 1977, only 65000 donums of the arable land were utilised for cultivation, that is, less than half the area utilised in 1971.⁽³⁾ However, the 1978 agricultural production plan suggested that about 70% of the arable land be utilised for cultivation, i.e., about 134436 donums, of which 20% to be utilised for cultivation of summer season crops and 80% for the winter season.⁽⁴⁾

(1) Although, rainfall agriculture is not particularly reliable, in the study area, it is nevertheless used quite extensively in the upper (north east) end of the study area and particularly in Qaim Qadha which accounts for some 42% rain fed agricultural land (See Planar, op.cit., Stage One, Appendices, P.D14).

(2) Central Statistical Organisation, Results of 1971 Agricultural Census, Ministry of Planning, Baghdad.

(3) Planar, op.cit., Final Report, P.21.

(4) Ibid, Stage One Appendices, P.D3.

According to recent reconnaissance surveys carried out by the State Organisation of Soil and Land Reclamation, the area outside the immediate river valley (narrower than the river basin in geological terms) is non-arable. The main problem even in the good surface soil areas is the shallow depth of the soil and sub soil layer formation.

The type of agricultural production varies according to the size and quality of arable land and to its distance from the main markets. Thus the eastern end of the study area where the river basin is wide and agricultural land relatively abundant (in the context of the study area), grains, legumes and vegetables are cultivated for the nearby Baghdad market. On the other hand, in the western end of this area, the cultivated crops, include onions, potatoes and cotton which can be stored and transported fairly easily.

Date palms and fruit trees cover about 15685 donums of the total areas along the river. According to 1971 agricultural census, the total number of trees in the area found to be about 865000 of which 612500 were date palms and the rest fruit trees, mainly citrus, apple, hardstone fruits, almonds, grape and so on. Again Ramadi Qadha accounts for 40-45% of the total number of trees in the study area. The number of trees in Hit Qadha are almost equal to that of Ramadi. About 70% of the trees concentrated in these two Qadhas are date palms.⁽¹⁾

Due to the above stated agricultural conditions animal resources are very limited in the study area. The total number of animals, in 1971, were estimated at 140000 sheep, 20000 goats and 14000 cows.⁽²⁾

The distribution of this resource is to a large extent directed by the size of land cultivated. Thus farmers cultivating small plots have few

(1) Central Statistical Organisation, Results of 1971 Agricultural Census, op.cit.

(2) Ibid.

sheep and goats, and the reverse is generally valid for those cultivating large plots. Ramadi Qadha accounts for 45%, 21% and 79% of sheep, goats and cows respectively. Ana Qadha follows with 20%, 27% and 4%. Qaim Qadha is not far behind Ana, with 18%, 23% and 3% of the livestock listed.

Finally, chicken farming is also practiced extensively. Two major poultry projects were established in the area, late 1970's, Ramadi project for producing eggs with a capacity of 70 million eggs a year and Thurthar project for producing meat with annual capacity of 21 million chickens. In addition to these two projects, the agricultural co-operative associations have established about 30 small poultry projects to produce meat with a total production capacity of 75 tons. Seventeen of these projects are concentrated in Hit Qadha, eleven in Ramadi Qadha and only two in Haditha Qadha.⁽¹⁾

(b) Mining and Quarrying

As has been seen earlier in this chapter, the study area is rich in different non-metallic raw materials and the mineral extraction and occurrences are distributed throughout different parts of the region, where ever minerals exist in commercial quantities. They are mainly concentrated in the south east and north east parts of the study area.

(c) Industrial land-use

The study area has not historically been industrial in character, and the limited number of existing industries of any size are recent additions. Accordingly industrial land use does not have an influential impact on the overall regional land use pattern. The very limited number of industrial activities in the region tend to be concentrated in Ramadi City. Of the total 22 large industrial establishments in the region in 1975, 18 were located in Ramadi City.⁽²⁾

(1) Planar, op.cit., Stage One, Appendices, P.D9.

(2) The large industrial establishment according to the definition used in Iraq is the one which employed 10 persons and more.

Most of these industries are local market-oriented industries, such as flour mills, bakery plants, ice-making, small textile factories, car repair and maintenance workshops in addition to construction material plants (clay bricks, concrete blocks and gypsum plants). The only influential industry in the region is the glass industry in the periphery of Ramadi City, which employs some 1570 persons. The next largest establishment appears to be a stone quarry in Haqlaniya near Haditha which employed 128 persons in 1977. Apart from that, very few industrial plants exist in Qaim, Haditha, and Hit which are mainly involved in construction industry, except in Haditha, where a small oil refinery factory exists in K3, employing about 50 persons.⁽¹⁾ However, the recent importance given to the industrial sector will effect to some extent the pattern of land use whether directly or indirectly.

Hence, it is possible to conclude that apart from Ramadi city, the rapid process of urbanisation in the region is not due to industrial development, but rather to the growth of administrative and service sectors. The very rapid growth of Ramadi City has been accelerated by the growth of industrial activities in the city, especially the glass industry. The total effects of industrial development (direct and indirect effects) contributed in increasing Ramadi's population by about 25740 inhabitants,⁽²⁾ i.e. 1/4 of its total population.

(d) Transport

At present time there are no rail, air or river transport facilities in the study area. The only transport routes are roads.

Map (6.7) shows that the main highway in the study area is the one which

(1) Compiled from data available in the Central Statistical Organisation of the Ministry of Planning.

(2) It is calculated, on the basis that large-manufacturing industries in the city employ about 1650 persons, the average family size is 7.8 persons and the regional employment multiplier effect is around 2 (for the source of the multiplier effects see section 6.5.2).

connects Baghdad with Jordanian borders at a distance of about 550 km. From Baghdad to Ramadi, it is dual carriage way (107 km.). From this highway a road some 100 km. long ending at Syrian border at Tennf exists.

Another main access route in the study area is the road which connects Ramadi with Hit, Haditha and Ana, south of the river route. From Haditha to Qaim there is an earth road some 130 km. in length.

Secondary roads connecting Hit with Kubiassa, Haditha with the site of the dam under construction and Qaim with Ubaidi also exist.

However, transport facilities under construction will improve the accessibility in the region and will affect to some extent the future pattern of land use. The new facilities include certain road schemes and railway schemes, (see map (6.8)) such as:-

- Express way No.(1): This will be of motorway standard (6 lanes) and the Western Section will closely follow the line of road connecting Ramadi-Rutba. Eastward from Ramadi it passes north of Falluja before turning South to Hella, Qadisiya and Basrah. It is expected to be completed early 1983.

- Qaim - Haditha road: it will be a class A road, 195 km, in length which will replace the existing unpaved Haditha-Qaim road. Most of the unpaved road will be flooded as a result of the Haditha dam construction. This road is expected to be completed by the end of 1982.

-Qaim - Akashat road: it will be a class A road, 125 km, in length. The aim of the road is to connect the phosphate mine at Akashat with Qaim. It is expected to be completed late 1982.

- Akashat-Rutba road: it will be a class A road, 90 km, in length. It is a continuation of the Qaim-Akashat road. It will connect with the already existing road (Ramadi-Rutba) some 20 kms. west of Rutba. It is

expected to be completed late 1982.

- Falluja-Habbaniya lake road: it will be 19 kms.in length, linking the new tourist village at Habbaniya lake to the main road. It is expected to be completed early in 1982.

- Baghdad-Qaim Railway: This line will be open for traffic by late 1982. It will be double track between Baghdad and a point 30 km's. west of Ramadi and single track between this point and Qaim and it will be utilised for both passengers and goods transportation.

- Qaim - Akashat Railway: it will also be open for traffic by late 1982 and is predominantly for goods traffic.

In addition to what has been stated above, local and agricultural roads are continuously being paved.

(e) Unused land

It constitutes the most parts of the study area except the very thin strip along the river. It is mainly desert areas with very low potentialities of agricultural utilisation but with very high mineral potentialities in concentrated deposits (see Section 6.1.5).

6.5. Economic Development and Urban Growth Pattern of the U.E.R. for the Period 1978-1985

As it has already been suggested, the development of the service sector and administrative sector, were the main causes of urbanisation and of the urban distribution pattern in the study area. The industrial sector has been shown to have a very limited affect in most cases except in case of Ramadi City where its direct and indirect effects accounted for about 1/4 of the city's population and the very high rate of growth of its population coincide with the establishment of Ramadi glass factory, the main industrial project in the region until the late 1970's. However, the very intensive development in the

region, the effects of which have not yet appeared fully, will have tremendous consequences on the socio-economic and physical pattern of development in the area.

Planar's study concerning planning for the U.E.R. showed that the total investment allocated to major projects in the region is about 1327.6 million I.D. It is expected that 97% of this amount will be spent by 1985.⁽¹⁾ This high amount of investment brings the per capita share in the study area to about 4200 I.D. i.e., 600 I.D. per capita per year during the period 1978-1985. This per capita investment is almost double that of Anbar Muhafadah (already mentioned in the last section), and six times higher than that of the country as a whole.

To discover exactly what effect the implementation of these projects will have on the urban growth of the region, some basic information about them will be given and then the effect of their employment multiplier will be estimated. Map (6.8) shows the location of these projects, whereas table (6.5) summarises the characteristic features of them:

6.5.1. Major Committed Development Projects


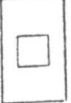




(a) Major Industrial Projects

There are four major industrial projects expected to affect, to a large extent the study area, they are:-

- The Qaim Chemical Complex
- The Hit Cement Factory
- The Number(2) Glass and Ceramic Factory in Ramadi.
- Stone Cutting Plant in Haqlaniya

(1) Planar, op.cit., Final Report, P.72. Taking the current implementation trends (Section 5.3.3) and the expected dates of completion of the committed development projects (table 6.5) into consideration, then the very high expected rate of implementation seems to be highly justifiable.

The Committed Projects

-  Major industrial projects
-  Tourist village of Habaniya
-  Hadiitha dam and reservoir
-  Iraqi express No. (1)
-  Road class (A) under construction
-  Railway lines

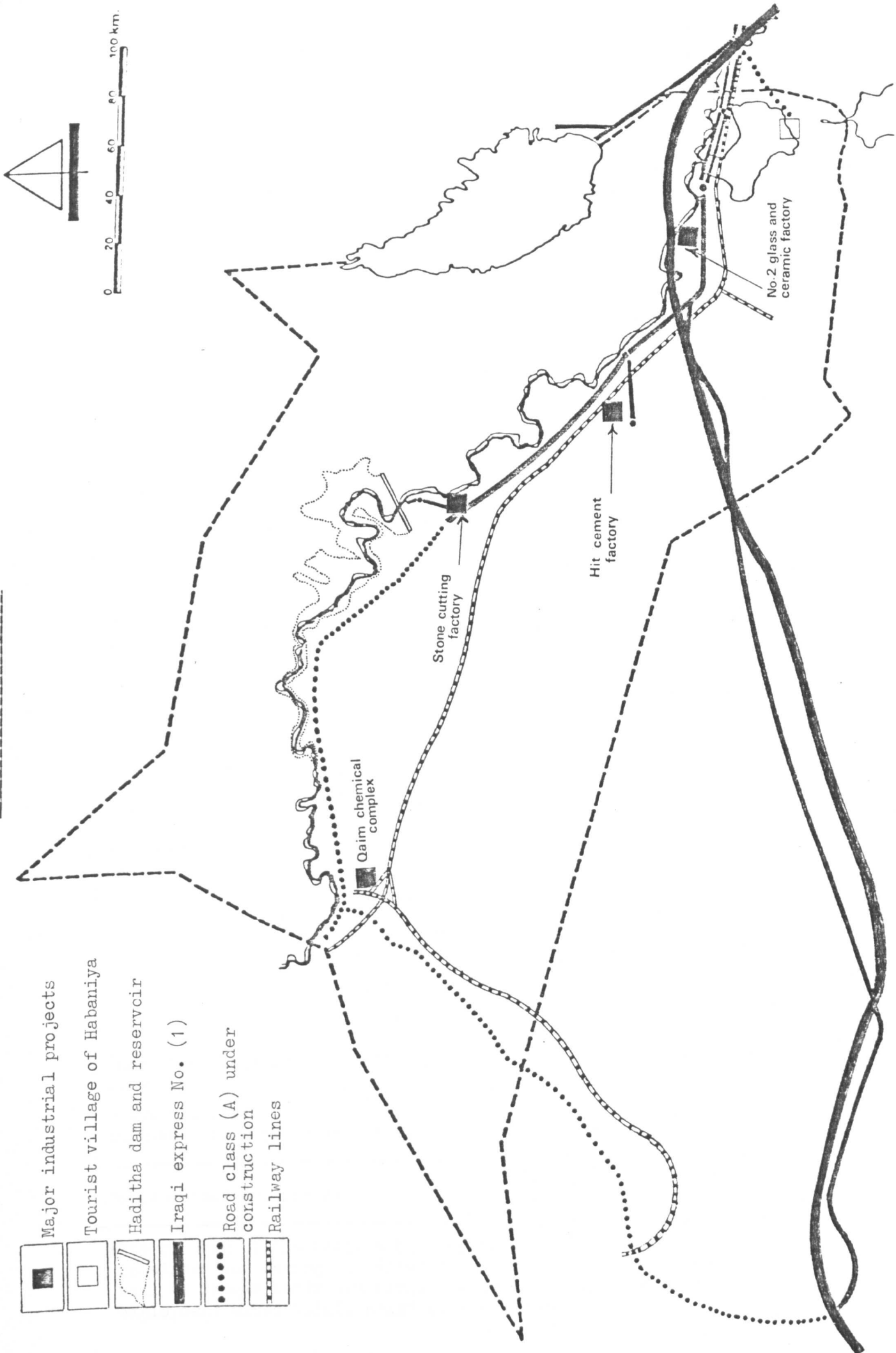


Table (6.5)

The Characteristic Features of the Committed
Development Projects in the U.E.R.

Project	Location	Employment	Expected Date of Completion
Industrial sector:			
Qaim Chemical Complex	Qaim	2555	1981
Hit Cement Plant	Kubiasa	600	1982
Ramadi Glass and Ceramic Complex:	Ramadi:		
Ramadi Ceramics Plant	Ramadi	228	Completed (1979)
No. 2 Glass Factory	Ramadi	1218	Completed (1981)
Stone Cutting Plant	Haqlaniya	172	Completed (1981)
Other Major Development Projects:			
Haditha Dam	Haditha	150	1984
Akashat-Qaim-Baghdad rail-line	U.E.R.		1982
	Ramadi	407	
	Hit	108	
	Haditha	99	
	Qaim	1346	
	Others	340	
Tourist village in Habbaniya	Habbaniya	1200	Completed (1979)*
Roads and other infrastructure projects	U.E.R.	292	
Total direct employment		8715	

*The running of the complex has been contracted to a firm of Swiss Hoteliers and during the first five years, only 20% of the staff will be Iraqis under training. Hence, the local effects of employment would mainly start by the end of 1983.

Qaim Chemical Complex

The Complex will create, in the first phase, about 2555 job opportunities, of which 180 persons will be employed in the adjacent water treatment project and 15 persons in a small waste treatment plant. The Complex will be the second largest in the study area up to 1985. In the long run, the Complex and its expansion will be the largest industrial Complex in the area.

The Complex is located about 17 km. south east of Qaim and about 10 km. south west of Ubaidi town. The Complex is planned to utilise the huge quantities of related raw materials in Akashat phosphate mines, some 150 km. south west of Qaim, to produce fertilizers. The production scale of the Complex will be in excess of domestic requirements of the country and large quantities will be exported. The project is expected to be completed by the end of 1981.

Hit Cement Plant

The location of the Plant was determined by the presence of important raw materials for cement within the vicinity of Kubaisa. It is about 12 km. north west of Kubaisa town. It will increase the capacity of cement production in the country significantly. The Plant, which is expected to be completed by 1982, will create 600 new industrial jobs in the area.

Ramadi Glass and Ceramics Complex

The addition of a second glass factory and a ceramic tile factory to the existing Ramadi glass factory will create the largest industrial Complex in the study area.

The Ceramic Tile Plant was completed in 1979. It created some 228 new industrial jobs. Full capacity of 4000 tons of tiles was expected to be reached by 1980. Although the site of the Plant is in the periphery of

Ramadi City, just next to the site of the existing glass factory, its raw material (clay), comes from Rutba some 340 km. distant. It seems, in deciding the location of the plant, its interlinkages with the two glass factories were the main factor.

The number two glass factory in Ramadi will concentrate on glass bottles and containers, leaving the already existing factory to specialise in glass sheets for construction. It will produce employment for a further 1218 persons, bringing the full capacity employment level of all three plants within the Complex to over 3000 and making the study area the only region of the country specialised in such an industry on a very large scale. The factory was completed in 1981.

Stone Cutting Plant in Haqlaniya

Stone is a main building material in the region and the state encourages the use of local construction materials in building due to the shortage of bricks, the main construction material all over the country. The plant which is located in Haqlaniya will create 172 new jobs in the area. It was completed in 1981.

(b) Other Major Development Projects

In addition to the industrial projects stated above, many other development projects are being constructed in the study area which in turn will affect the economy, land use pattern and urban size distribution of the study area. Among the most influential projects are:

The Haditha Dam⁽¹⁾

The idea of constructing the dam is an old one. It is as far back as 1959. Since that time many studies have been carried out and alternative suggestions have been presented. Finally in 1974 a site of the dam was chosen. The dam is located some 7 km. upstream of Haditha. It includes a hydro-electric power station and a spillway on the right

(1) For a full detail of the project see, Regional Planning Department, op.cit., PP.267-278.

bank of the river.

The dam will cause the formation of Haditha reservoir, with an area of 500 sq.km. at a normal storage level. The reservoir will be 155 km. in length, with 4 km. average width and 16 m. average depth. It will have a storage capacity of 7.5 million cubic metres of water and will generate 1500 million k.w.h. per annum of electricity.

The project will flood about 176000 donums of land of which 22400 is cultivable. Ana town, the lower part of Rawa town and about 57 small villages will be flooded. About 30% of the palm and other fruit trees in the study area, 150 km. of paved roads and 115 km. of communication lines will be damaged.

The total population that will be affected as a result of the construction of the dam is about 19751 inhabitants, according to 1977 population census, of which 60% are urban (living in two urban centres namely Ana and Rawa towns), and the rest are rural settlers of both Ana and Haditha Qadhas. Table (6.6) shows the distribution of these populations by administrative units and environment.⁽¹⁾

Table (6.6)

Distribution of Haditha Reservoir Dam Population by Administrative Units and Environment

Administrative Unit	Urban	Rural	Total
Ana Qadha Centre	6734	1617	8351
Rawa Nahiya	5133*	2319	7452
Haqlaniya Nahiya	-	1500	1500
Parwana Nahiya	-	2448	2448
Total	11867	7884	19751

* The lower part of Rawa town will be flooded which contains about 63% of its total population.

Source, Planar, op.cit., Final Report, table (1 & 2), P.51.

(1) For the details of the socio-economic characteristics of the Haditha reservoir population see, Planar, op.cit., Different Stages; Regional Planning Department, Planning for the U.E.R., op.cit., PP.246-265 and Socio-Economic Study of Haditha Reservoir Population, Baghdad, 1977.

The project aims at; controlling the levels of the Euphrates River water after entering Iraqi borders; it will help in establishing new agricultural projects in the central and southern parts of the country; it will generate substantial electric energy necessary to meet the increasing industrial, as well as residential requirements of the country; it will create a wide lake which could be utilised as tourist resort and for fish industry purposes. Finally the project will create 150 permanent job opportunities by 1984, the year of completion of the dam. In the shorter term, it will add about 10000 jobs during the construction phase.

Railway lines Projects

The already mentioned under construction two rail lines in the region, will create about 2300 job opportunities. The expected date of completion is 1982.

Tourist Village in Habbaniya

It is designed to cater for up to 2000 overnight visitors. The recreational facilities are designed to cater for up to 2800 people. It is provided with a variety of recreational facilities and the access to the Complex will be by a new 19 km. stretch of road connecting it with the main Baghdad-Ramadi road just across the river from Falluja. At present the access to the Complex is through a secondary road. The first stage was completed in 1979. The expected job opportunities that will be created by the project are 1200 persons by 1983.

In addition to the above projects, many others are under construction in the study area, such as roads (mentioned in the previous section), small scale industrial projects, infrastructure projects and so on. Because of their limited employment effects in operating phase, they are excluded from the analysis.

6.5.2. The Regional Multiplier Effects of the Committed Projects

Implementation of such a development programme will have many consequences on the economy of the region. It will increase the region's share of national production, raise its performance, change the structure of the economy of the region, raise the standard of living of its population, and affect the spatial distribution of the existing urban growth pattern and so on. However, the impact of any development project is not restricted to its direct effects, but indirect and induced effects are of crucial importance. The regional development plan for the U.E.R. forecasting the impact of these projects on the economy of the region found that:⁽¹⁾

First, they will lead to an increase in the value added from 68121000 I.D. in 1977 to about 126241000 I.D. by 1985, at an annual rate of growth of about (10.8%).

Second, they will lead to changing in the relative importance of the regional economic sectors. From 1977 to 1985 most sectors will increase the contribution they make to the gross regional product, mainly at the expense of services which will decline from 43.5% of the total to 34.3%, and which will move down from first position to second position. The Construction and the Manufacturing sectors shows the largest individual increases. The Manufacturing Sector moves up from fifth position to third and the Construction Sector takes over first position from Services. The relative importance of the Construction Sector will increase to about 37.8% and that of Manufacturing to about 6.3%.

However, what is most important to this study is the effect of the

(1) Planar, op.cit., Stage Two, Appendices, Baghdad, 1979, Table (B.4.2), P.B11 and Table (B.4.3), P.B12.

operating phase⁽¹⁾ of developmental projects on the employment in the region. The total numbers of direct jobs created by these projects is expected to be 8715 by the end of 1984 (see table (6.5)). This direct employment will generate other rounds of indirect and induced employment⁽²⁾ or it has, what is known in economic and planning literature, an employment multiplier effect. The Planar's regional

-
- (1) In the construction phase, these projects will have remarkable effects on output, income and employment. But because these impacts are temporary ones and will be eliminated entirely by 1984 (the year of completion of all these projects), they have been neglected.
- (2) These three mechanisms have been formalised in a model developed by Hansen and Tiebout (See W. L. Hansen and C. M. Tiebout, 'An Intersectoral Flows Analysis of the California Economy', Review of Economic Statistics, Vol. 45, 1963, PP.409-418), and set out also in a study by Yeates and Lloyd of the impact of a programme of industrialisation in Ontario. Yeates and Lloyd estimated the total employment generated from

$$M_i = E_i + \sum_{j=1}^n E_{ij} + \sum_{k=1}^n E_{ik}$$

where: M_i = total employment

E_i = direct employment initially created in industrial sector i,

E_{ij} = indirect employment, generated by the demands of sector i on sector j, and

E_{ik} = induced employment, generated by the demand of the workers in sector i on the final demand of sector k.

(See M. J. Moseley, *The Impact of....-II*, op.cit., P.79). Though the above model is non-spatial model. Moseley, believes that its useful three fold categories of generated employment can easily be translated to the geographical dimension.

development study, by developing a multiplier model,⁽¹⁾ found that the regional employment multiplier was 2.035. This multiplier ratio sounds justifiable since the actual data of 1977 shows that commodity/tertiary employment ratio to be 1.177 and consequently total employment/commodity sectors employment ratio was 2.177, that is, the ratio of commodity sectors jobs⁽²⁾ to total jobs in the study area was 0.459. The very slight

(1) To estimate the regional employment multiplier, the following methodology have been developed:-

1. The following formulation have been adopted to calculate the direct, indirect and induced effects of these projects on the commodity sectors themselves

$$O_j^r \times \frac{\sum_i j a_i^r c_i^r}{1 - p^r}$$

Where, O_j^r is the annual operating expenditure of project j.

ja_i^r is the expenditure of project j on regional sector i.

c_i^r is the propensity of regional sector i to consume in the region

p^r is the average propensity to consume in the region.

2. The impact of additional exogenous and induced investments have been calculated, that is, the extra investment which will be required to basic services (schools, health facilities, infrastructure) for increased regional population; the additional investment in the region resulting from the resettlement associated with the construction of Haditha dam; and additional investment which will be induced by the increased output and employment resulting from the investment schemes already described, together with the further component which will result from any of the investment schedules of the individual economic units which go to make up the regional economy.

The first and second components were combined and their overall impact on the region was assessed using the following model:

$$I^r \times \frac{\sum_i a_i^r c_i^r}{1 - p^r}$$

Where, I^r is investment in the region

a_i^r is expenditure on regional sector i

c_i^r and p^r as defined above.

The calculation of the effects on public services have been based on the official standards of different services per 1000 persons

The third component, the induced investment, it is thought that it is likely to begin after 1985, so it is ignored in calculating the multiplier effects of employment. (See Planar, op.cit., Appendices of Stage Two, PP.B14-B34).

- (2) The commodity sector jobs include jobs in the agricultural, mining and quarrying, the manufacturing and the electricity, water and gas sectors, whilst the tertiary sector jobs include the ones in the transportation and communication, the wholesale and retail trade, the banking, insurance and real estate and other services sectors.

reduction to 2.035 in 1985 is also justifiable since the region is just in the take off stage of development, which implies that; many of the institutional and administrative frameworks are not yet completed; many of the settlement and resettlement schemes are expected to take place in a new site which will require new municipal and administrative departments and a complete staff to provide different types of services; and as it will be seen later, the lack of some basic services and/or the lack of spare capacity in services provided in many existing urban centres will keep the above figure by 1985 as high as it was in 1977.

Accordingly, the total number of job opportunities that will be created in the study area as a result of implementing the above stated projects is expected to reach about 17730 jobs (See table (6.7)), of which 55% will be generated by the industrial sector and the remaining by other major development projects. If the spatial effects of this development is taken into consideration one can find that about 45% of the total generated employment will go to Qaim Qadha and 35% will go to Ramadi Qadah. Therefore, these two Qadahs will contain about 80% of the total generated employment. The remaining 20% will be distributed among other parts of the region (see Table (6.7)).

Assuming that the average family size of people working in such projects will be 4 persons,⁽¹⁾ this means that the total effects, of the committed development on the urban growth of the region, will be 70940 persons. Based on the distribution of direct employment, and, assuming that the regional employment multiplier effect is the same all over the region⁽²⁾, then the share of Qaim Qadha will be 31752 persons and the

(1) The average family size is assumed 4 persons depending on the results of similar cases occurred recently in Iraq (see footnote of table (6.7)).

(2) This assumption has been adopted due to the unknown geographical differences in the multiplier effects.

Table (6.7)

Expected Growth of Urban Population as a Result of
Implementing the Committed Development Projects

	1	2	3	4		5	
Qadha	Site	Direct Employ- ment	Indirect and Induced Employ- ment	Total Employ- ment	%	Total Number Of Population	%
Ramadi	Ramadi	1853	1918	3771		15084	
	Habbaniya	1200	1242	2442		9768	
	Total	3053	3160	6213	35	24852	35
Hit	Hit	108	112	220		880	
	Kubaisa	600	621	1221		4884	
	Total	708	733	1441	8.1	5764	8.1
Haditha	Haditha	249	258	507		2028	
	Haqlaniya	172	178	350		1400	
	Total	421	436	857	4.8	3428	4.8
Qaim	Qaim	3901	4037	7938		31752	
	Total	3901	4037	7938	44.8	31752	44.8
Other Parts of U.E.R.	-	632	654	1286	7.3	5144	7.3
Total		8715	9020	17735	100	70940	100

Sources, Columns (1) and (2) extracted from table (6.5)
 Columns (3) and (4) extracted on the basis that the Regional multiplier effect of employment is 2.035.
 Column (5) extracted by multiplying Column (4) by 4.
 4 is assumed as an expected average family size. This average family size, is adopted from similar studies carried on in Iraq in recent years. See for instance the study of Al-Baker new industrial towns which, based on the actual situation of the already existing Al-Iskandaria new industrial town in Babylon, has adopted this average in Planning for the town. (General Directorate of Planning and Engineering, Master Plan of Al-Baker New Industrial Town, (In Arabic), Ramzi Press Ltd., Baghdad, 1975, P.24.

share of Ramadi Qadha will be 24852 persons. The remaining expected urban growth will go to Hit Qadha (5764 persons), Haditha Qadha (3428 persons) and other parts of the region (5144) persons mainly along the rail lines to serve them directly.

6.6. Proposed Urban Growth Strategies for the U.E.R.

Before suggesting an urban growth strategy for the U.E.R., it is necessary to examine the possible solutions suggested by other studies, if there is any. Hence this section aims at exploring the remedies suggested for the problem of urban growth in the region by previous studies, their limitations, their approach to analysis and the criticisms that could be made of them. The three studies which have dealt with the regional development strategies of the study area will be presented here, i.e.; first, the Zaramba urbanisation directives; second, the Regional Planning Department study of the U.E.R. and finally, the most important study of the U.E.R. development and resettlement of Haditha reservoir population conducted by Planar (private consulting team).⁽¹⁾

(1) It should be noted that there is a Ph.D. thesis conducted in the University of Manchester which dealt with the implementation of regional planning in Iraq, case study of the U.E.R. This study will not be presented here due to the fact that it dealt mainly with the problem of plans implementation and the institutional structure of the central planning system in Iraq. It proposed a structure for the implementation of regional planning in Iraq. Furthermore, although the title of the study indicate that it is a case study of the regional planning implementation of the U.E.R., the study adopted a hypothetical health project to examine its hypotheses and to recommend an implementation structure for the regional planning in Iraq. Hence, it is far beyond the scope and aims of the present study to be presented here in some detail (For a full detail of the thesis, see Emil J. Shaman, Proposed Structure for the Implementation of Regional Planning in Iraq (case study of Upper Euphrates Region), Ph.D. thesis, University of Manchester, 1979, PP.1-539.

6.6.1. Zaremba's General Urbanisation Directives

In the previous discussion of the spatial economic development in Iraq, it was pointed out that problems of concentration of both economic development and urban population in few urban centres became so apparent that they required explicit consideration in the overall National Development Policies. In an attempt to solve the problems of disparities of spatial growth, early in the last decade, Iraq adopted regional planning as an equity tool of solving such problems. A Regional Planning Department at the Ministry of Planning was created in 1972. To undertake its tasks, the Ministry invited, among others, Professor Feodor Zaremba, a Polish expert in town and regional planning for parts of the years 1972-1974, to give advice in the process of dividing Iraq into planning regions and to help in formulating spatial development strategies.

In 1974, Zaremba submitted a report entitled. "The outlines of the strategy of Spatial Development in Iraq."⁽¹⁾ In this report Zaremba's proposed strategy reflected the significance of the three major metropolitan regions, Baghdad, Basrah and Mosul as the main "Poles of Development", with urbanisation concentrated along axes of development that are parallel to the two rivers, the Tigris and the Euphrates. Hence, "The main axes of development form a huge figure '8' with Baghdad at their centre....The trends of spatial development of Iraq are based on the "Poles and Corridors" system of growth."⁽²⁾ The resulting system consists of three poles of urban development, each connected with the nearest one by two corridors of development. (see map (6.9)).

(1) P. Zaremba, The Outlines of the Strategy of Spatial Development of Iraq, Ministry of Planning, Regional Planning Department, Baghdad, 1974.

(2) Ibid, P.6.

Map (6.9)

Main Axis of Development of Iraq - Three poles of growth.

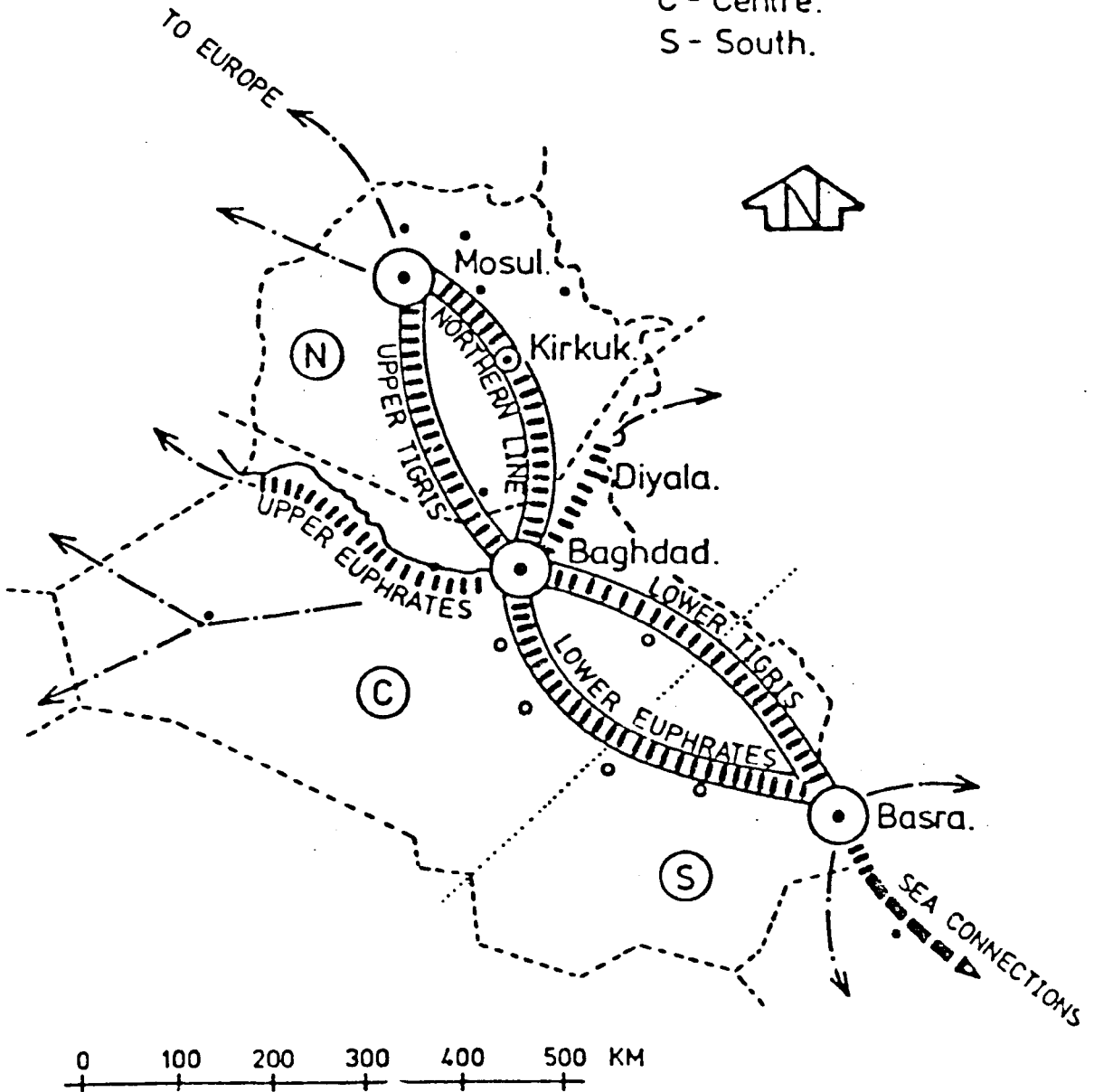
Four main corridors of development (and two secondary)

MACRO REGIONS

N - North.

C - Centre.

S - South.



Source, Zaremba, P, "The outlines of the strategies of spatial development".

According to Zaremba's strategy, the U.E.R. was considered as a secondary corridor of development. The strategy suggested that the main urban centres of this corridor (Ramadi, Habbaniya, Hit, Haditha, Ana, Rawa and Qaim), should accommodate around 300000 inhabitants by the turn of the century.⁽¹⁾

Zaremba's spatial development and urbanisation strategy introduced a general useful guide line which was likely to help the physical and regional planners at the national and regional levels to introduce and develop a new planning procedure into the Iraqi planning machinery and to develop a regional development plan. However, the study embodied many draw backs to be regarded of any important interest in determining the urbanisation policy in Iraq, in general, and the U.E.R., in particular. These draw backs could be summarised as follows:-

First, the proposed strategy of spatial development by Zaremba does not differ from the conventional approach of development that had been applied in Iraq over the past three decades. Al-Jabiri stressed this point and stated that, "It encouraged further investment concentration in the traditional, and comparatively prosperous, metropolitan centres, and, more seriously, it stressed the importance of the growth pole (centre) theory as a policy instrument for spatial development in Iraq through the implicit assumption that nature (the geographical configuration), and the historical trends of urbanisation and development have created agglomeration economies in these poles that made them more favourable for further development."⁽²⁾ As a consequence, Al-Jabiri argued that this strategy ignored two important facts, "Firstly, the historical trend of development in Iraq, which has followed almost the same strategy, although no strategy was officially announced, has led to a seriously unbalanced urban structure, accompanied by spatial

(1) Ibid, P.29.

(2) Rasool F. Al-Jabiri, op.cit., P.197.

differentials in the concentration of economic activities, particularly industry, and in per capita income. Secondly, it overlooks the conceptual and technical deficiencies in the growth pole (centre) theory."⁽¹⁾

Second, because Zaremba's study is on a macro scale hence, the urbanisation strategy proposed by him in the mentioned report is too vague. Moreover, it does not deal with the U.E.R. by itself in detail, but rather as a part of the whole country. The general outlook of the report does not leave the opportunity to answer some vital questions, as why the main urban centres should accommodate the 300000 inhabitants, how that will be brought about, where exactly they will be accommodated and consequently what is the most efficient urban growth pattern in the region. Zaremba attempts, in a highly descriptive way to explain his proposals. He does not really cast any light on the unbalanced urban hierarchy in the region, nor does he formulate the urbanisation policy that is capable of re-ordering and reinforcing the spatial relationships between various urban centres in the region. However, the vague policy could also, in part, be attributed to the dates of formulating both the urban policy and the economic development strategy. The first one was formulated in 1974 whilst most of the major development projects, which as it has been seen will be the main cause of the urban growth, were involved within the National Development Plan, 1976-1980. Since as it has been seen in Part One, both economic development and urbanisation are almost synonymous processes, such time differences did not provide the opportunity for Zaremba to know exactly the type, size and spatial distribution pattern of investment which would help him in further elaboration of the urban growth pattern. More recent studies based on more concrete bases, i.e., the committed economic development and close examination of the economic development potentialities of different parts

(1) Ibid, P.197.

of the region indicate that between 1978-1985 the urban population will increase by about 71000 inhabitants (see previous section) and as it will be shown later (Chapter Nine) the urban population will further increase by about 207000 inhabitants for the period 1986-2000 bringing the total population in the region to about 455 thousand inhabitants by the turn of the century, i.e., about one and a half times that estimated by Zaremba. These differences in the urban growth estimation of the main urban centres could be taken as an indication of the no more reliability of Zaremba's proposed urbanisation strategy.

6.6.2. Regional Planning Department Study of the U.E.R.

In 1974 a new structure for the regional planning department was set up.⁽¹⁾ According to this structure, the department consisted of four planning groups each concerned with planning for a specific area. The U.E.R. was among the areas of interest in order to solve the problem of where to locate the population that would be affected by the creation of Haditha Reservoir.

The study which was conducted in 1975 by a multi-disciplinary team including qualified town and regional planners, architects, transport engineers, geographers, economists, statisticians and urban sociologists, stated that its aims were; first, to formulate development strategies which ensure the achievement of rapid and comprehensive development of the different aspects of the region (socio-economic and physical aspects) within the framework of the National Development Planning of the country; and second, to derive the planning principles which would guide the resettlement of Haditha reservoir population in accordance with the

(1) Up to 1974 the department was working as one unit consisting of few researchers, mostly unqualified planners involved mainly in conducting the required surveys and studies to assist Zaremba to produce his preliminary reports concerning the division of Iraq into planning regions, the outlines of the strategy of spatial development of Iraq, and two other general studies concerning the directives of development of Baghdad and Basrah metropolitan regions.

regional development strategies.⁽¹⁾ However, it did not achieve either of the stated aims. It did not progress beyond the preliminary stage of the planning process, where a detailed inventory of the different regional aspects was collected. The inventory stage extended to include the natural features of the study area, population growth and distribution, economic base, social services and infrastructure, commercial services, details on Haditha dam and the resulting reservoir and the tentative socio-economic characteristics of the population that were expected to be influenced directly by the dam. No proposals for either the future urban growth pattern nor for the resettlement scheme were formulated by the study. Instead, it recommended that a further comprehensive studies of both aspects should be carried out in order to find an appropriate solution to both questions. Hence, although this study provides some important data on different aspects of the region which can be used as a reference in conducting further studies, it has a very limited importance as far as the urban growth pattern in the region is concerned.

6.6.3. Planar's Urban Growth Strategy

After beginning the construction of Haditha dam, resulting in the flooding of Ana town, the lower part of Rawa town and some 57 villages, resettlement became a real problem to be faced. This problem needed a serious solution before the Haditha reservoir could be filled with water by the end of 1984. The solution to this problem could not be undertaken in isolation of the remaining parts of the region. Hence the Ministry of Irrigation, the responsible authority for implementing the dam, asked Planar (Iraqi consultants in planning, architecture and research) in 1978 to carry on a special and comprehensive study concerning the regional development of the U.E.R. and the resettlement

(1) Regional Planning Department, Planning for the...., op.cit., P.A.

of Haditha reservoir population under the supervision of the physical planning commission of the Ministry of Planning. The study, which lasted eighteen months, consisted of three main stages;⁽¹⁾ the inventory stage in which a detailed study of different aspects of the region were studied after formulating the aims, objectives and limitations of the study; the alternative strategies formulation stage in which alternative strategies of both regional development and resettlement scheme were presented and discussed; and the final stage which was completed by the end of 1979 and on which a preferred regional development pattern and resettlement solutions were suggested.

The Planar's study represents the first successful regional planning attempt in Iraq. It was based on a comprehensive and systematic approach in presenting different aspects of the planning process. It incorporated the political strategies and the National Development Plans objectives in its analysis and policies. It presented a realistic picture of the existing situation of the region and forecast a long run picture which depended on the aims of the long run National Development Plans and by the use of relatively sophisticated regional economic forecasting models.

In its three stages, the study elaborated on many crucial aspects of the regional development plan and the resettlement scheme. In formulating the regional development alternatives the plan gave considerable attention to the problem of supply and demand of the labour force and the efficient utilisation of domestic raw materials based on a "Disaggregated Matrix Technique."⁽²⁾ the study derived both the regional development alternatives up to the year 2000 and the resettlement of Haditha reservoir population and suggested the preferred

(1) Planar, op.cit., Different Stages.

(2) The basic principles of this technique will be outlined in the next part.

regional development and resettlement strategies. The study also extended to include a chapter on phasing the implementation of both plans and suggested the organisational framework responsible for their implementation.

Despite the comprehensive outlook of the study to both regional development of the area and the resettlement of Haditha reservoir population, the most apparent defect of the study was that it did not give sufficient attention to the problem of the growth of urban settlements and the distribution of the expected urban growth. Although the study elaborated on the existing urban system pattern, stated its main deficiencies and regarded overcoming these deficiencies among the aims of the regional development strategy, nevertheless it did not achieve this aim. All that it did in this respect was to state in a very broad way the effect of the regional development up to 1985 and 2000 on the urban system and summarise this effect as follows:⁽¹⁾

1. The establishment of a new town near Ubaidi and the establishment of a major industrial project in Qaim urban node⁽²⁾ will reinforce the relative importance of the small towns and their main urban centre (Qaim town).

2. The establishment of a cement factory and the new town between Kubaisa and Hit will enhance this area and reinforce Hit urban node.

3. The implementation of transport network will increase the accessibility within the urban system. It will especially reinforce the linkages between urban centres of Qaim urban node and other parts of the study area from one side and with Syria from the other side.

(1) Planar, op.cit., Final Stage, PP.79-81.

(2) By urban node it is meant all the urban centres that are within a diameter not more than one hour travel time, with Qadha centre as a focal point of it(see section 8.3).

4. The existing relative large size of Ramadi, having a relatively strong economic base and with the concentration of administrative and services activities will continue to reinforce it as a leading and dynamic urban centre in the region.

5. The creation of a new town near Haditha dam site will affect the pattern of growth of Haditha town itself and will reinforce the whole Haditha urban node, especially in the long run and after the creation of tourist activities in the area.

Hence, based on the committed employment in different parts of the region and the derived employment multiplier effects, the study concluded that the population of each urban node would increase from the existing size to a certain size without specifying, except in case of the suggested new towns, where the expected urban growth should be directed, i.e., is it to the main urban centres in each urban node or to other existing urban centres. The study accepted the suggestions made by the Ministry of Industry, for establishing a new town in Qaim, Haditha and Hit, and the State Organisation of Resorts and Tourism, for establishing a new town near Habbaniya tourist village, without examining by an analytical approach the necessity of such action, its effects on the whole urban system and whether or not the suggested new towns could solve the deficiencies of the urban system which have been stated earlier. The study did not consider the costs and level of services that could be provided in these suggested new towns compared to other possible alternatives, such as the expansion of the existing urban centres. Furthermore, the study did not examine the social, structural and environmental consequences of establishing such towns compared to expanding the existing ones. In total, the study failed to provide a justifiable solution, in socio-economic and physical terms,

to the problem of urban growth in the region. The study concentrated mainly on the alternative patterns of economic development of the region and the resettlement of the population of Haditha Reservoir. Almost half the text of the study had been devoted for solving the latter problem.

However, it should be noted that the very rough analysis of the expected changes in the urban system may, in part, be due to the scope of the study. It is a regional development study, most likely oriented toward examining and solving a macroregional problems and accordingly micro results, such as the ones at question, are not expected from it.

Hence, in order to avoid such serious defects in regional planning practice in Iraq and bring about an analytical evaluation approach to the problem of urban growth, this research will primarily deal with this problem. It will, in the following part, examine, analyse and evaluate the possible alternatives of urban growth strategies in the U.E.R. basing on a selected evaluation technique and by taking into consideration all the factors that are expected to be of real importance in deriving the preferred urban growth policy.

6.7. Summary

Different aspects of the study area, whether they are physical, demographic and/or economic, were examined in this chapter.

The study area which is part of Anbar Muhafadah was until the late 1960's among the depressed areas of the country experiencing an increasing rate of loss of population. Since early 1970's the situation has changed remarkably. The rate of population growth started increasing and by 1977 the annual rate of growth reached its peak at a rate of growth of 5.5%. These changes reflect the special importance given to the region in recent development plans, in an attempt to transfer it from a relatively depressed region to an economically active part of the country.

As a general trend all over the country, it is found that; first urban population was growing at a rate of growth higher than the average rate of the total population growth; second, more than half the region's population showed to be concentrated in Ramadi Qadha, the main administrative unit in the region; and third, urban population concentration showed to be an important factor in intensifying the overall population concentration trend, where again about 50% of the total urban population were concentrated in Ramadi City in 1977. This pattern of urban concentration produced an unbalanced urban size distribution in the region. Moreover, the spacing of urban centres is found to be also unbalanced. The physical characteristics of the U.E.R. played an important role in shaping the pattern of distribution of the urban centres along the Euphrates river.

The economic base of the region characterised by the very limited agricultural potentialities and very high mineral potentialities which provide a strong bases for construction, glass and ceramic and chemical industries. The industrial role in the growth of the region was very limited until the recent years. However, it is expected that the role of the latter sector to increase after the operation of the committed industrial projects in the region. Consequently the rapid process of urbanisation of the region was not due to the industrial development but rather to the growth of the administrative and the service sectors. Only the very rapid growth of Ramadi City has been accelerated as a result of the industrial activities created in the city late 1960's.

The transport facilities which are limited, at present, to roads only are poor. However, transport facilities under construction which include roads and railways schemes will improve the accessibility in the region and the country as a whole and affect to some extent the future pattern of the regional land use.

The committed major development projects, with high regional multiplier effects, are concentrated in Qaim and Ramadi Qadhas. It is expected that 80% of the urban growth until 1985 will concentrate in these two Qadhas.

Finally, it is found that no serious attempt to study the problem of regional urban growth pattern in an analytical and systematic approach has been adopted in Iraq yet. This work represents an attempt along this way.