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Summary

This study sets out to explain why a particular urban form, the arrangement of urban fabric with its physical and social dimensions, is as it is. It is proposed that urban form is closely related, both as an outcome of and a contributor to, general societal processes through the physical development process by which the urban fabric is produced and its form established. By tracing the interaction of the agencies and structures in this social process and its contexts, the component parts of the development process and their role in determining urban form are identified. It is argued that, in a development process, there are development agencies which operate through certain development factors within interrelated social and physical contexts.

Applying this analytical framework to the case of Tehran, after identifying the general characteristics of urban form, the process of development of this urban fabric since the second half of the nineteenth century has been studied. The development agencies and their interrelationships, purposes, and rationalities, as well as their social and physical environments, are investigated. The interaction of these agencies with the development factors is then analysed, the latter including the resources they use, such as finance, land, labour, building materials, and technology; the rules they acknowledge, such as the planning system; and the ideas underlying their production of the space, concepts inherited from previous generations or borrowed from other cultures. These investigations show how the interplay of the agencies and factors of development has resulted in the production of the urban fabric and its particular form. This is an interplay in which a few component parts, resources such as land and finance and rules and ideas such as the planning system and the concepts of space, and the agencies which control and use them, often play the most significant parts. Nevertheless, given the circumstances, other component parts can each gain a decisive role.
INTRODUCTION
The growing concentration of people in urban areas, although at very different rates across the world, is a fundamental feature of modern times. Characterizing this process is the creation and expansion of built environments to accommodate the ever increasing urban populations and activities. There is no doubt that the progressively complex physical forms that these conglomerations take have some relationship with the general societal processes which have led to the redistribution of populace in favour of towns and cities and to the creation of urban fabrics. However, it appears that, although many studies have centred on urban form, the arrangement of urban fabric with its social and physical dimensions, there is still a large conceptual gap as regards this relationship. This implies that many more studies are required to provide frameworks for understanding urban form in relation to wider societal contexts and it is towards this end that this study hopes to take a step.

1. Aims and Objectives

In order to find out about the relationship between general societal contexts and urban form, a main question has been formulated as, "why is a particular urban form as it is?", to be supplemented by another question as to "how is it likely to change?". The primary aim of the research is, therefore, to find a response to this main question through attempting to identify the determinants of urban form and to reach a better understanding of their relationship with urban fabric, with each other, and with the wider contexts of which they are a part.

The main proposition of this research is that urban form is tightly related to, both as an outcome of and a contributor to, general societal processes, those processes in which human beings interact with their physical and social environments. It is further argued that this relationship will be understood by specifically focusing the research on the physical development process, a major component part of the societal processes through which the urban fabric is produced.

It is hoped that the response to the research questions would contribute to the discussions attempting to provide conceptual frameworks with which each particular urban form would be studied. It is also hoped that, by tracing the links between urban form and societal processes, not only an awareness of the former will result, but also that some new insight into the latter, as reflected in built form, will be achieved.
This research is the outcome of the attempts of an architect-urban designer to find a better understanding of urban form. Although it is not directly oriented towards design, the study is expected to provide an awareness which would be of assistance in the process of urban design. The study, therefore, has been carried out not only to analyse and explain urban form but also to assist the work of those involved in designing the elements of urban fabric.

Located within the subject matters of social and environmental sciences, the research is designed to develop a methodology, or at least an analytical framework, which is then empirically tested in a case study. It will, therefore, also be useful in providing information about a particular urban form and process. The outcome of this research can not, and is not meant to, be conclusive and final. It is intended, however, to provide platforms which would pave the way for further research.

2. Methodological Approach

Although a full discussion of the methodology is given in Chapter One, it seems helpful to put forward its outline here in the Introduction to show how it is in close relationship with the main question and the proposition of the research.

In order to develop a hypothetical response to the main question of research, it is helpful to take into consideration that urban fabrics are often built and re-built over a relatively long period of time. This conveys the notion that its form would be best understood by investigating the process of its making. Proposing a series of fundamental questions, as to when?, where?, how?, and why? the urban fabric has been produced will unravel the most important determinants of its form. Since urban fabric is produced by human agencies, its form is determined by the way these agencies operate, with certain development factors, within given social and physical contexts. Any attempt to understand urban form, therefore, will need to focus on interactions of contexts, agencies and instruments across time and space. Based on these focal points, it will be then possible to work out a methodology to be applied and tested in a case study.
3. Selection of the Case Study

The case of Tehran has been chosen for a number of reasons. There are only a few studies of urban form of this city. Although numerous general discussions have been made about Tehran, there are serious deficiencies in investigating its spatial characteristics in the academic studies. Most of the studies of urban form in Iran have been concerned with traditional urban fabrics, which Tehran is largely short of. The rapid and seemingly chaotic expansion of this city have appeared unattractive to the students of form. Other studies, which have been concerned with social and economic processes of Tehran, have paid little or no attention to its form. Therefore, a study which looks at Tehran’s urban form within its wider societal contexts will fill a gap. The study will also make some contribution towards understanding the urban development process in Iran.

In a country such as Iran, it is Tehran, the capital, the country’s connecting point to the outside world, which has witnessed a diversity of phases of urban development. This has provided its urban form with a variety of different patterns which would be absent in other cities of the country. Furthermore, it is this city which sets the pattern for other cities of the country and, therefore, its study would be assisting the study of other cities by showing how its urban form has developed.

As one of the large cities of the Middle East and of the Third World, a study of urban form in Tehran would contribute to the research in these fields by providing information and analysis.

There are also personal reasons for this selection. The experience of living, studying, and working in Tehran has helped the author develop his ideas about urban form; that this experience has made him familiar with Tehran more than any other city; and that this experience has given rise to an enthusiasm about finding the results of the research in this particular context.

4. Organization of the Study

After the Introduction, the first chapter starts with a discussion of some of the variety of approaches to definitions of urban form, followed by a review of existing approaches to analysis and understanding of urban form. Discussing these theoretical and practical approaches, mostly drawn from urban geography and architecture, the chapter then
moves to establish and develop the conceptual bases and the methodology of the study. Before that, however, a brief account is given of the approaches to the Third World urban phenomena and form, of which the selected case is a part.

Chapters Two to Seven are devoted to the case study of Tehran. Chapter Two provides a description of the particular urban form of Tehran, mainly through the analysis of census data at both levels of city-wide urban structure and for urban quarters. The main characteristics of Tehran’s urban form are thus put forward as a description of the phenomena to be analysed and explained.

Chapters Three and Four look at the contexts in which Tehran’s fabric has been developed. Chapter Three discusses its physical environmental context through both natural and built environments and how these have undergone radical transformations. Chapter Four investigates the contexts of the social environment, which have evolved since the nineteenth century in Iran, by tracing political, economic, and social developments.

Within the frameworks defined in these two chapters, Chapter Five focuses on the identification of the development agencies and their relationships with these frameworks. Chapters Six and Seven look in more detail at the development factors with which development agencies interact to produce urban fabric and its determining impact on urban form.

Chapter Six investigates the resources which these agencies use, discussing the subjects of finance, land, labour, building materials, and technology. Chapter Seven looks at the rules and ideas involved in the development process, including the planning system and the concepts of space.

The final chapter produces a summary and conclusion of the case study, an evaluation of the methodology applied, and some speculations about the use of the findings in design processes.

More detailed information about the analysis of Tehran’s urban form can be found in the Appendices to Chapter One. The rest of the Appendices are devoted to further information about the historical evolution of urban form in Iran. For the sake of clarity and consistency, all the relevant investigation of the development of urban form which referred to periods before the nineteenth century have been placed in these Appendices.
These include the Appendix to Chapter Three, the Appendix to Chapter Four, and the Appendices to Chapter Seven. The only exception to this has been the brief account of the emergence of Tehran as a city and as the capital of Iran.
Chapter One

CONCEPTUAL FRAMEWORKS
OF THE RESEARCH
This chapter is meant to establish the conceptual foundations of the research. It is divided into two sections. The first section is a review of the definitions and approaches to urban form. The purpose of such a review is to discover, from these definitions and approaches, ideas which will be helpful in addressing the research question. The second section is devoted to developing a methodology for the research. It is a logical consequence of the first section, drawing together the concepts which have resulted from the review and from the examination of the subject. The second section also addresses the conduct of the case study and the research methods applied.

1.1. A Review of the Approaches to Urban Form

Urban form has been studied by a variety of disciplines, each having a different approach to its understanding with different definitions and conceptual frameworks. After trying to establish a definition of urban form, this section seeks to review two distinct approaches to urban form: those of urban geography and urban architecture, which have provided conceptual frameworks for other disciplines such as urban planning and urban design. The final phase of the review is a brief encounter with the approaches to the Third World societies and urban form. During the course of the review, the ideas which seem helpful in the attempt to work out a response to the main research question are identified to be used afterwards in the development of the theoretical and practical bases of this research.

1.1.1. Definitions of Urban Form

The term urban form has been defined from many different points of view. Reviewing the literature in search of an explicit definition, Bourne (1982:29) recounts that he has encountered an "immense diversity and frustrating inconsistency" in the way researchers have used terms such as urban form and spatial structure.

Urban form has been equated with the term "townscape", which was developed by Smailes (1955) as the urban equivalence of landscape, comprising the visible forms of the built-up areas. Its three main components are street plan or layout, architectural style of buildings and their design, and land use (Herbert & Thomas, 1982). In historical approaches to urban form, cities are studied through their morphological component parts such as, in the case of medieval cities, walls and gates, streets and

Urban designers define urban form in both two-dimensions, in terms of its physical extent, street pattern and different areas; and three dimensions in its sculptural expression of different heights and shapes (Lowndes & Murray, 1988). It has been equated with "skyline" (Hedman & Jaszewski, 1985). In search of the domain of urban design, the physical elements of urban form have been identified as land use, building form and massing, circulation and parking, open space, pedestrian ways, activity support, and signage (Shirvani, 1985). Morphological elements of urban space are identified as streets and squares (R. Krier, 1979a; 1979b), blocks (L. Krier, 1978), which have been geometrically typified, and quarters (Ungers et al., 1978; L. Krier, 1979).

As for Reekie (1972), the town consists of: buildings and other structures; open and enclosed spaces; and vehicular and pedestrian circulations. These are arranged in the central core, in residential, industrial, and recreation areas. This definition is to some extent consistent with that of Scargill (1979) who defines the form of cities in two distinct scales. There is a form which the elements of physical fabric of the city take, dwellings and the more specialized structures in which retail, office, and manufacturing functions are housed. There is also a form which "assemblages of structures" take.

For Clark (1985:667), urban form is "the juxtaposition of land use zones in an urban area, regarded as the response to variety in accessibility". Rogers (1971:210) defines the theory of urban spatial structure as being concerned with the disposition of human socio-economic activities in urban areas, with the goals of discovering, explaining, and ultimately predicting regularities that exist in people's adaptation to city space.

Criticizing the attempts which equate urban spatial structure with physical arrangement of land uses, Bourne (1982) tries to elaborate the definitions of urban form and urban spatial structure to allow for both spatial and aspatial dimensions of the city. Within the boundaries and restrictions of systems theory, Bourne defines urban form as the spatial pattern or "arrangement" of individual elements within a city system. These elements include built environment, buildings and land uses, as well as social groups, economic activities, and public institutions. With interactions, these individual elements are integrated into functional entities or sub-systems. The patterns of behaviour and interaction within sub-systems, when overlaid on urban form and combined with a set
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CONCEPTUAL FRAMEWORKS OF THE RESEARCH

of organizational rules which link the sub-systems together into a city system, constitute the urban spatial structure.

Each of the stated definitions seems to refer to one or more aspects of a multi-facet phenomenon. Indeed, the diversity in the definition of urban form stems mainly from the fact that urban fabric is both a physical and a social artifact (Harvey, 1985:226). As Gottmann (1978) interprets, the built environment is a "hardware" in which the socio-economic system works as "software". Any study of urban form, therefore, should address these two interrelated dimensions or, if focused on certain aspects of form, be able to locate the focus with due considerations towards these two major dimensions.

Physically, urban fabric might be seen as a grouping of built spatial units. Here the study of form can, at different scales and in both two and three dimensions, refer to single buildings, blocks, urban quarters, and the whole urban fabric as the combination of these physical component parts. It is also possible to focus on the space between these parts in the study of pattern of streets and squares.

The social dimension of urban form deals with the spatial arrangement and interrelationship of the characteristics of the people who build, use, and value the urban fabric. Here the study of urban form refers to the way the physical entities, single or in group, are used and valued, their spatial arrangements, and their interrelationships.

Social and physical dimensions of urban form have a dynamic relationship. Physical fabric is conditioned by different social procedures. At the same time, the form of urban space, once built, can exert influence upon the way these procedures recur.

On these bases, it is possible to envisage urban form as a spatial continuum in which individual elements, with both physical and social dimensions, are combined progressively through their interrelationships shaping complex combinations, from the scale of single buildings up to the level of entire urban fabric. In other words, the city as a whole might be seen as formed by a spectrum of structures at various scales down to the level of a single element. At all levels, physical and social, dimensions of the structures are interwoven, though distinguishable and modifiable in the degree and the extent of their linkage.
1.1.2. Approaches to Urban Form

Approaches to the study of urban form have been as varied as the approaches to its definition. Yet it is possible to identify two basic explanatory approaches within the frameworks of the disciplines of geography and architecture. The difference between the descriptive nature of the former and the prescriptive nature of the latter is minimized when they focus on the urban phenomena. Geography, which had started with describing the phenomena on the earth's surface, narrowed down to the level of intra-urban studies in the field of urban geography. On the other hand, architecture, which was mainly concerned with the design and construction of single buildings, extended its scope to cover whole cities. Though different in their subject matter, these two lines of investigation of urban form have found their overlap in the prescriptive fields of urban planning and urban design.

Despite this vicinity, their different approaches to the understanding of the urban phenomena, as reflected in their different areas of interest, has kept them apart leaving a large gap in between. Whereas urban architecture tended to see the city as a physical entity, urban geography shifted its focus more on the people who lived inside this fabric. In this way, urban geography concentrated on the study of urban spatial structure as against the study of the urban fabric carried out by urban architecture. A linking approach between them has been urban morphology which has combined elements of both.

1.1.2.1. Urban Architecture's Approach

The architectural approach to the study of urban form, which conveniently might be called the "design" approach (Eisenstadt & Shachar, 1987), deals with the plan of the city, the various components of urban space, and its functional and aesthetic aspects. The approach mainly seeks to explain urban form with an ultimately practical aim of being an aid to the design process.

Due to the presence of aesthetic aspects, the city in this approach is explained mostly through a set of values. The cities are seen as a gathering of people who create "a collective surplus of enjoyment" and a gathering of buildings which can collectively give visual pleasure (Cullen, 1962:9). The city is an act of will, a work of art which is made up of two elements of the architecture of movement and the architecture of
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repose (Bacon, 1975:322). A purpose is worked out for the city: to offer pleasure and psychological welfare instead of stultification (Smith, 1977:261).

1.1.2.1.1. Conceptual Bases

The pattern of conceptual development of this approach, consistent with the social developments of the post-war period, shows an oppositional movement towards the accepted norms. This is reflected in a major dichotomy which has dominated this line of enquiry for more than two decades: the contrast between modernism, the established post-war approach to design, and post-modernism, which emerged as a reaction to it from the 1960s (Jencks, 1973). This contrast has deeply affected the way urban form and phenomena have been explained. Both Morris (1979) and Vance (1977), in their historical research, focus on the contrasting categories of towns which have been developed on a "planned" or "preconceived" basis as against the "organic growth". This view expresses a debate on the role of planning in the development of urban areas. It is similar to the contrast between "blueprint" and "process" principles of design identified by Bourne (1982), or to "utopian" as opposed to "natural" (Gosling & Maitland, 1984). It is manifest in the contrast between "modernity" and "tradition", between "revolution" and "evolution" (Smith, 1977), between centralized authority and the people, and between laws and master plans with piecemeal growth (Alexander et al, 1977). Other aspects of this dichotomy are the difference in the scale and the scope: the universal plan as against specific working details (Collins & Collins, 1986), and in the battle against and for the revival of aesthetics (Scruton, 1983; 1979). These are the lines of argument of post-modernism against modernism which was criticized for its stress on "technology, authoritarian utopianism, and mega-scale thinking" (Collins & Collins, 1986:125).

This dichotomy has its counterpart in social philosophy in the discussions of Habermas and Lyotard (Dews, 1986). Albertsen (1988:355) tries to establish a link between the transition from high-modernism to post-modernism with the transition from high-Fordism, the post-war socio-spatially centralized system legitimized by grand narratives of progress and emancipation, to post-Fordism as a socio-spatially decentralized system whose characteristic is the "exhaustion of utopian energies" (Habermas, in Albertsen, 1988). Harvey (1989:256-7) refers to modernism as the utopian programme to transform society by transforming space, a programme whose failure had linked modernism to capital accumulation through mass production. Modernism was representing corporate power, and, with the changing circumstances, post-modernism was gaining ground to represent the flexible accumulation of capital.
Despite the extensive literature produced by the design approach, Eisenstadt and Shachar (1987) argue that it has provided almost no paradigm, and that many of the studies in this approach, aiming at identifying the unique features of the city structure of a given period or place, are ideographic. It should be noted, however, that, although the approach has not developed a complete conceptual framework, it has provided considerable information on architecture and urban forms, which has helped understanding of urban design and basic elements of the internal structure of the cities.

Moreover, the relationship of modernism with pre-modern and post-modern schools of design and thought and the attempts which have tried to put these relationships into changing societal contexts have provided valuable insights to the dynamics of both form and societal contexts. Any study of urban form, therefore, due to the predominance of modernist thinking in a large part of the present century throughout the world, will have to take it into consideration. It will have to address its impact on the production of that particular urban form, along with its associated societal processes, and the types of reaction to it.

1.1.2.1.2. Approaches to Urban Form

One of the major lines of research in the design approach has been to envisage the city as an "historical creation" (Benevolo, 1980:5), or an "historical process" (Blumenfeld, 1982:51).

One branch of the historical approach has been dealing with identifying the architectural styles and the development of various urban forms in historical periods with an attempt to explain the relation between societal processes and these developments (Benevolo, 1980; Morris, 1979; Vance, 1977). A similarity between this approach and that of urban historical geography and urban morphology might be found with the difference that the historical approach in design stresses more the architectural details.

Benevolo (1980:5-6) tries to explain the development of cities on the basis of the "major changes in productive organization that have transformed everyday life", and the subsequent rise in population in each period. The change in physical environment, which is influenced by all other aspects of civilization and in turn influences them itself, and the way they are hindered by the monuments of the past and hastened by the buildings of the modern era are subjects of study. From a descriptive viewpoint, Morris
(1979) has aimed to study the most significant examples of urban form, through their morphological component parts, and also to establish the factors with great determining effects on urban form, especially the "politics of planning".

Another branch within the historical approach was the post-war townscape movement which aimed to study the historical evolution of cities as a concern for preservation and conservation against the threats of redevelopment (Sharp, 1968). The modernist approach to history was developing an evaluation and a critique of the past to establish modern solutions as an achievement of the age (Le Cobusier, 1971; Gidieon, 1967; Gibberd, 1959). The urban form of the past is studied to prove its inability to cope with the requirements of the modern civilization (Sert, 1944).

As a reaction to this, the post-modernist branch is concerned with the urban forms of the past for developing a critique of the present and propositions for the future. An approach developed by Sitte (1945, originally 1889) was to extract "universal principles out of the array of specific examples that old cities present" (Collins & Collins, 1986:64). This was criticized by the modernists as breaking from the time (Gidieon, 1967); returning to medieval values; and to the praising of aesthetics, which was unacceptable in "an age of motor-cars" (Le Corbusier, 1971). With the revival of this approach, "the traditional syntax of the cities" is appreciated, since it has been developed over millennia and is entirely sensitive to a wide range of psychological needs and aspirations (Smith, 1977). This approach has been criticized on grounds that it reinforces its argument "with all the nostalgia and authority which this view of the past can provide" (Gosling & Maitland, 1984:29).

One of the early branches which developed as a counter-movement towards the modernists with the aim of humanizing the approaches to urban form was a search for the image of the city and its "legibility" (Lynch, 1979). It stimulated extensive research on patterns of behaviour and mental mapping of the cities and held a strong position in the development of criteria for morphological studies and design (Bentley et al, 1985; Tibbalds, 1988; Jacobs & Appleyard, 1987). Cultural imperatives in the development of urban form (Rapoport, 1977; 1969) and symbolic meanings attributed to the site of a city or a particular structure within it (Harvey, 1985; Tuan, 1977), and to the allocation of different areas in the city to various groups (Tuan, 1982), and the alignment of walls, gates, and major road axes (Wheatley, in Eisenstadt & Shachar, 1987) have constituted major lines of investigation of urban form.
Ecological methods were applied in which the city was understood as a form which is derived from "geological and biological evolution, existing as a sum of natural processes and adapted by man" (McHarg, 1969:175). The historic development of the city is also perceived as a sequence of cultural adaptations which reflect in the city plan and its constituent buildings both individually and in groups.

The city as a natural phenomenon, a concept which Tafuri (1980) traces back to the century of Enlightenment and the development of capitalism, is reflected in a number of design approaches. Alexander et al (1987:13) identify a shared feature between the old towns and "all growing organisms", which is a "self-determined, inward-governing, growing wholeness". For Smith (1977), the city of the past has evolved according to universal principles in which the growth is the result of transaction between organism and environment on the basis of a fixed rule.

Morphological studies of the past have also been carried out by trying to explain the development of urban form and architectural styles through the development of capitalism (Tafuri, 1980:178). Therefore, modern architecture is regarded as an attempt to resolve the imbalances, contradictions, and retardations which characterize the capitalist reorganization of the world market and productive development. Also the appreciation of the collective memory through the monuments of the past (Rossi, 1982); and the identification of the pre-industrial urban elements of the street, the square, and the quarter, form a basis on which the re-integration of public realm contributes to the struggle against capitalism (R.Krier, 1979a; 1979b; L.Krier, 1979; Gosling & Maitland, 1984).

Morphological rules of thumb have been proposed to study the urban form at three levels of basic components; elements; and historical and contemporary characteristics. Here the positive contribution of urban design is seen to confine its ideas to small and manageable areas such as blocks, streets, or buildings. Urban morphology, an empirical form of study as approached by urban geographers, is considered as offering considerable opportunity for the "understanding and appreciation of historical and morphological context" (Lowndes & Murray, 1988). This approach to urban form has been criticized as leading to environmental determinism, ignoring the economic, political, and cultural context within which buildings have been produced. What is called for are the guidelines which translate "all our understanding about the contemporary ways the built environment is produced, used and valued" (Healey, 1988:4).
Different branches of the historical approach have tended to study the morphology of certain significant cities or parts of them to provide the required information on morphological developments; or to provide patterns for future policies concerning urban form, such as preservation and conservation; and to provide a framework for criticism either from the present or the past approaches to urban form.

Whatever their differences, these approaches seem to share the notion of the historicality of urban fabric. This notion, which has been taken as the starting point of this research, has been developed out of the belief that since cities are built over long periods of time, any approach to urban form should take account of this historical evolution. However, it should be noted that, since urban fabric has social and physical dimensions, only those views of historical evolution of urban form that address both these dimensions simultaneously will be useful.

In this way, by considering that urban fabric is the outcome of an historic process of development, it will be possible to establish links between form and general societal processes by focusing on this development process. The development process, as the social process through which urban fabric is produced, finds a central importance in the study of the form of this fabric. It is through tracing this process that the course of the development of a particular urban form and hence its rationale and its determinants will be identified.

Researchers of urban form, along with those involved in the conservation and development of the city, are thus required, as Jacobs (1985:137) proposes, to know how cities have grown and developed physically and how this has been related to their social and economic history. This, however, is a notion which the design approach, due to its specific concentration on physical dimensions of urban fabric, has not sufficiently developed. In order to find conceptual frameworks which address the development process as a social process, other approaches to urban form, notably that of urban geography, should be taken into consideration.

1.1.2.2. Urban Geography's Approach

The demand for a better understanding of the economic, political, social, and cultural context has been developed within urban geography. Urban geographers' approaches to urban form, within a variety of conceptual bases, might be categorized in two distinct
branches of urban morphology and the analysis of the internal structure of the city. Whereas the former deals with the individual component parts of the city, such as buildings and land uses, and their arrangement, the latter tends to focus on the form that the groups of individual component parts take and their interrelationships.

1.1.2.2.1. Conceptual Bases

Before the 1950s, the traditional geographical approach mainly dealt with synthesizing separate features into a regional unity (Hall, 1984). In addition to this regionalism, Herbert and Thomas (1982) refer to two earlier paradigms in the traditional approach: exploration and environmentalism, the latter at times reaching the stage of determinism, investigating the ways in which the physical environment affects the functioning and development of societies.

From the 1950s onward, the conceptual bases of urban geography have experienced a rapid evolution. New paradigms reoriented the perspectives of urban geographers, mainly resulting in a greater regard for the philosophies of the social sciences. The pace of the emergence of new paradigms resulted in tensions, and a situation in which no paradigm has been totally discarded (Herbert & Thomas, 1982).

The need to relate "shapes on the ground to the shapes in society" (Carter & Wheatley, 1979:237), the need to reconcile the social and physical space (Shaw, 1979); focus on the relationship between pattern and the underlying social, economic, and political processes, have been stressed by social geographers (Pooley & Lawton, 1987). During this period, other social sciences, especially economics, sociology (Saunders, 1981), political sciences (Agnew, 1987), and urban history (Tilly, 1984), have found a much greater awareness of the need for the recognition of the roles of space in the comprehension of human behaviour. As King (1990:1) puts it, "physical and spatial urban form actually constitute as well as represent much of the social and cultural existence".

The evolution of geographical thought during the post-war period has taken the form of three main branches: a quantitative, a subjective, and an institutional. Hall (1984) identifies the various stages of this evolution as being a quest for deeper levels of explanation, the latter two being developed as a reaction to the former. This pattern, mostly in essence being associated with the growing social movements since the late 1960s, shows consistency with urban architecture's approaches to the study of urban form. The difference occurs in the way they apply concepts and ideologies to their
subject matter in response to their different aims and objectives and their different nature.

1.1.2.2.1.1. Quantitative Approach

In this approach, patterns of urban land use are described on the basis of models relating location and accessibility through the price mechanism. The approach, which is called quantitative for the sake of convenience, is also called "neoclassical-functional description" (Johnston, 1982), "empirical-analytical" (Bourne, 1982) or "quantitative-theoretical" (Herbert & Thomas, 1982). It focuses on documentation of the spatial organization of society and is strongly linked with the "quantitative revolution" (Hall, 1984). Having "spatial analysis" as its paradigm, it became the dominant approach in contemporary geography (Herbert & Thomas, 1982).

The central feature of the quantitative approach, first started in the USA, was an explicit philosophical position, logical positivism; a trend towards the development of geography on the basis of a quantified form of theory such as "models"; and subsequently tested through empirical observation (Hall, 1984). The description of the earth's surface was replaced by an attempt to search for underlying laws governing the distribution of certain features on the space of the earth. The explanatory models of the approach stem in part from those of neoclassical economics, emphasizing the price-fixing mechanisms through competition in the free markets, into which the extra costs of crossing distance are introduced by the geographer; and from the functional sociology of Talcott Parsons with its demographic notion of social structure (Johnston, 1982).

Characteristics of the post-war scientific developments in America which were transferred to urban geography as spatial analysis were: a stress on general trends and patterns and interpreting specifics within a theoretical matrix instead of focusing on the unique and exceptional; an application of numerical methods to analyse data and so becoming "scientifically" respectable; and an apparently predictive power capable of being used in the development of public policy (Herbert & Thomas, 1982).

The theoretical underpinnings of the approach were: location theory, which was previously developed in Germany and dealt with the mapping of economic costs onto geographic space; and the gravity model and its later more sophisticated derivatives. Borrowed from the Newtonian physics, the latter argued that the interaction between any two points on the earth's surface would be found to be directly proportionate to the
size or mass of the place and inversely proportionate to the distance between them. For the urban geographer, the application of location theory and spatial physics resulted in the search for the underlying order in urban behaviour in the framework of a social science. Urbanites, producers or consumers, were rational beings with pure economic objectives who confronted the "friction of distance" in geographical space. To overcome this, they created spatial regularities, in various forms of urban space, patterns of land use, and the distribution of inter- and intra-urban trips, that were the expression of basic universal laws. Absent from this approach was an explanation of urban phenomena where sociological, psychological, cultural, and political factors came in (Hall, 1984).

1.1.2.2.1.2. Subjective Approach

The subjective approach, or as it is also called, "behavioural" (Johnston, 1982), "symbolic" (Eisenstadt & Shachar, 1987), or "subjective-humanist" is identified more as a critique rather than a precise methodology with a cohesive structure (Herbert & Thomas, 1982). In the late 1960s, as a counter-movement to the quantitative approach, a general shift occurred towards a much more individually oriented, small-scale approach to urban studies (Hall, 1984).

The approach attacked the quantitative approach as being mechanistic, aggregative, "dehumanizing", failing to separate fact from value and reducing place and space to abstract geometries in which man is a "pallid entrepreneurial figure" (Ley in Herbert & Thomas, 1982:34). The "black box" now becomes the subject of study and the role of human values of space are re-asserted. Location theory is no more a series of equations which weigh cost and distance. It was argued that the "environment in the head" is important because "it is the subjective environment which influences behaviour" (Rapoport, 1980).

The subjective approach has increasingly accepted the broad frameworks of phenomenology as defined by Husserl who argued that the world could only be understood through a knowledge of the attitudes and intentions which motivated human behaviour. A proposed narrower concept focuses on the ideas and beliefs that lie behind human action and argues that behaviour must be understood through the mind of the "actor" at the point in time and space in which it occurs (Herbert & Thomas, 1982).
Two intellectual developments resulted that did not produce major traditions, although they proved interesting. In the first one, individual behaviour, and individual perceptions as a key to that behaviour, were stressed. This was reflected in the work on mental mapping of individuals and groups (Hall, 1984). In this strand, sophisticated quantitative techniques are used to analyse large data sets collected from individual respondents. The internal structure of the city has been studied in the light of two particular decisions about living and shopping places. Many of the resulting bank of empirical analyses and techniques tested hypotheses derived from the neoclassical approach, notably that people aim to travel as short a distance as possible (Johnston, 1982).

The stress in the second development was on the cognition of the individual as a guide to his or her culture. The concern is more with a verbal, instead of quantitative, presentation of the ways in which people experience the world around them (Johnston, 1982). Although little empirical research was produced, it led to a rediscovery of regional geography, interpreted in terms of individuals' perceptions of time and space. This was a phenomenological approach in which the researcher, to avoid the imposed conceptual strait-jacket of the positivist thinkers, needed to get inside the individual actor (Hall, 1984).

1.1.2.1.3. Institutional Approach

The institutional approach (Johnston, 1982), also called "radical" or "socially concerned" geography (Hall, 1984), "structuralist" or "political economy" (Herbert & Thomas, 1982), originated from the social movements of the late 1960s, and was a reaction to the established approaches. By the early 1980s, this approach constituted almost the standard geographical approach (Hall, 1984).

It attacks the other two branches for ignoring the realities of human decision making and focuses on the "constraints that society as a whole, and particularly certain groups within it, imposes on the behaviour of individuals" (Johnston, 1982:81). The institutional constraints are disregarded in both other approaches: in the positivism of the quantitative approach which focuses only on statistical associations between various aspects of the socio-economic system and the models emphasizing individual choice; and in the subjective approach which studies only the perceived world of individuals who may well be only dimly aware of these constraints.
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CONCEPTUAL FRAMEWORKS OF THE RESEARCH

The claims of the established approaches of being objective, value-free, and politically neutral were criticized to be working to serve the existing social system and enable its survival. The main other themes of criticism were: the assumption of consensus arrangements between conflicting and unequal social groups; the descriptive role of the quantitative approach and the mechanical way in which it could predict within the prescriptions of existing orders; and the reductionism of subjective approaches.

Hall (1984) identifies the role of the liberals in this approach. Their focus on the question of "who got what in the contemporary city", led to the study of distribution of money income, of access to private and public services, followed by looking at the political processes within the city to understand how inequalities arose. The Marxists rejected the logical positivist philosophy that the liberals and the quantifiers shared, and adopted the view that objective knowledge of reality, as the product of a given socio-economic formation, can only be achieved by understanding the historical laws that govern the rise and fall of such formations.

The institutional approach argues that the main determinant of locational behaviour is power, particularly economic power, and identifies the core of problems facing geographers as being the structural analysis of capitalism and its spatial manifestations (Johnston, 1982). Structuralism, described as "a diffuse tendency rather than a really consistent doctrine", is concerned with grasping the meaning of underlying structures. It is a holistic scheme which views patterns and processes as largely affected by "structural imperatives" (Herbert & Thomas, 1982:41).

Despite the criticisms of the existence of "hidden structures" (Scruton, 1985), the value of structural approaches should be stressed as pointing towards the broader contexts within which urban spatial structures and social problems must be studied. Points of departure occur at more detailed levels of understanding, where local factors need to be considered. This has led, within the framework of structures, to the study of "symbolic" or social values and the impacts of more localized organizations and institutions, as well as the study of "managers" in the societal system (Herbert & Thomas, 1982). There have been attempts to integrate the different approaches as "openings" which lead to the flexibility of Marxist thought (Herbert & Thomas, 1982). An example of this has been Pickvance (1974) who suggests that the mode of production exercises a general rather than a specific effect upon the social content of spatial forms.
1.1.2.2. Approaches to Urban Form

The approaches of urban geography to urban form might be grouped into two trends which focus on internal structure of the city and on urban morphology. An examination of these two trends will reveal how urban geographers have approached urban form both at citywide and at more detailed levels.

1.1.2.2.1. Internal Structure of City

The study of the internal structure of the cities started from the traditional descriptions of urban structure, generalized in three models, concentric, sector and multiple nuclei, and developed to a combination of these models in the form of social area analysis through the methodology of factorial ecology (Bourne, 1982).

Korcelli (1982) identifies six major approaches from varied, and, until recently, unrelated disciplines which have contributed to the existing body of theory on urban spatial structure and growth. These approaches are: ecological concepts from sociology; theories of urban land from economics; urban population density models from demography; models of intra-urban functional patterns (or spatial interaction models) from urban planning; settlement network (or system) theories; and models of spatial diffusion on intra-urban scale, both from geography.

The earliest classical model of the city structure, developed in 1925, was that the growth of a city takes place concentrically. Inspired from the study of plant and animal ecology, Burgess envisaged the outward growth of the city resulting from invasion and succession, providing a descriptive framework to study both the spatial organization of land use in the city and its change over time, and the relationship between population mobility and social organization (Scargill, 1979; Herbert & Thomas, 1982).

This theory was supported by urban land rent theory which assumes the centre of the city as highly desirable, and due to shortage of land supply, the users will make competitive bids for a site here (Alonso, 1971). The theory was criticized due to its static-equilibrium form and the assumptions which tend to simplify reality, such as the location of all the service and employment opportunities at a single city centre, a symmetric pattern of transport costs and the condition of perfect competition. Importance of factors such as topography, directions of urban growth, environmental quality, and historical factors were empirically established in numerous studies (Korcelli, 1982).
Hoyt in 1939 formulated a sector model on the basis of rent levels in residential neighbourhoods. According to him, the residential areas were not distributed in the form of concentric rings, but as pie-shaped sectors. "If one sector of the city first develops as a high, medium, or low rental residential area, it will tend to retain that character for long distances" as through the process of city’s growth, the sector extends from the city centre along transportation routes (Hoyt, in Nelson, 1971:79).

These two models are modified by a third, the multiple nuclei model, which was developed by Harris and Ullman in 1945. They argued that the city grows around a number of centres, not from a single one, which are, in number and specialization, proportionate to the size of the city.

These models were tested extensively in many cities with no conclusive results. The pattern of intra-urban population density, described as a negative exponential decline of density with the distance from the city centre, was also another supportive theory which was never invalidated (Korcelli, 1982). This has been attempted to be explained in two ways: that cities are subject to de-concentration processes as a result of the passage of time and growth in size; and that the de-concentration processes, linked to certain economic, technological and cultural factors, are a feature of the modern world.

The traditional models were developed in a certain period in America and, due to the change in circumstances, they failed to be applicable to other times and places. Yet they remained as valuable conceptual tools for analysing the city. Hoyt (1971) attempted to summarize the effects of urbanization, of widespread ownership and use of the car, high rise construction for office and residential use, and other social and technological changes on the distortion of the traditional patterns. Bourne (1971) called for attention to be paid to the additional effects of changes in attitudes and in political and institutional organization.

As against the declining relevance of the traditional models of the city structure, Berry (1971) argued that, in each city a different combination of three classic principles of urban location operate: cities as the sites of special functions; cities as the expressions of the layout and the character of transport networks; and cities as central places.

Another attempt to address the processes which shape the internal structure of city is by Gottmann (1978). For him, the city, as a social and political phenomenon, exists with
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the concurrence of three components: a large number of people, their built environment, and a combination of models of life. He argues that the life and form of the cities are directly and indirectly affected by the forces that modify the society, categorized traditionally under four titles: demographic forces; economic forces; the impact of technological change; and cultural variation.

There have been attempts to introduce overriding principles determining urban form, as exemplified by Mumford (1975), who views the cities of all times as expressions of various combinations of two principles: accumulation and conquest (Tilly, 1984). Another version of this approach might be found in Eisenstadt and Shachar (1987) who identify two processes of concentration and centrality at work in the formation of the cities and urban systems. The city is seen as a mosaic, each of whose parts is the outcome of different environmental orientations, and whose concrete form is influenced by these orientations in different combinations (Cohen, 1976; Eisenstadt & Shachar, 1987).

For Nelson (1971), some of the most significant factors, contributing to the urban structure in American cities, include rapid and massive growth, a heterogeneous population, the desire for a single family detached house, and the changing form of urban transportation. Blumenfeld (1982:51) looks at the urban form as a result of "the interaction of situation, function, and site". It also results "from the concepts in the minds of its citizens and from the types of structure they build, both derived from pre-urban roots; and from the reaction of these on situation, function, and site, and on subsequent human activity".

Scargill (1979) envisages the processes which shape the city in two principal categories: the historical processes, focusing on the impact of the former patterns of land ownership on the growth of the city; and the political processes concerned with the role of politicians and planners. According to Ravetz (1980:13), the stress is on "the ideas or deliberate policy and design...; the technology (building)...; and the influence of cities as mechanisms for the control of some people by other groups".

As a proposition on the nature of structural growth of the city, Bourne (1982:37-9) introduces "designer principles" as addressing the "rules, both explicit and implicit, that act to 'design' the structure" of the city. These principles pose the essential question of "why cities are laid out the way they are? Who then determines or designs the spatial
form of the city? and on what criteria?". He identifies in the literature three sets of designer principles: blueprint; process; and relational principles.

Blueprint principles describe a premeditated process of planning and reflect the presence of a complete monopoly over the instruments of design. In the process principles, the gradual evolution of urban structure is emphasized which has taken place through a sequence of thousands of events, actions, and decisions in which the parts fit together through adaptation, or trial and error. Three types of such processes are identified: competition, as reflected in land market and territorial claims, which generate contradictory processes of co-operation and monopoly; socialization/stratification, as reflected in the process of social clustering, networks and organizations; and institutions, as reflected in the formalized patterns and rules of behaviour.

The third set of designer principles include viewing the urban spatial structure as based on some physical analogue, incorporating principles of least effort, minimization of the friction of distance, maximum entropy, allometric principles, or biological analogies. Bourne argues that in contemporary times, any urban area in some part is subject to all these rules of design, thus "the internal structure of the city mirrors a complex interplay of pressures that derive from competing -if not contradictory-attempts to 'design' a structure that fits someone's image and/or interests".

The extensive literature which the studies of the internal structure of cities have provided a rich source of theoretical and practical approaches to urban form. Any attempt to utilize these approaches, however, will need to take into account the limitations inherent in their conceptual bases, as referred to earlier. The quantitative techniques, which study the locational behaviour of individuals and their impact on determining the urban structure, will then be of prime importance when coupled with the consideration of their double involvement with social structures and systems discussed by the institutional approach.

1.1.2.2.2. Urban Morphology

The term morphology means "the science of form" (Shorter Oxford Dictionary, 1970), which studies the "shape, form, external structure or arrangement, especially as an object of study or classification" (Supplement to the Oxford English Dictionary, 1976). It has been mainly used in biology for the study "not only of shape and structure in plants, animals and microorganisms, but also of the size, shape, structure, and
relationships of their parts". Although it is typically contrasted with the study of functions of organisms and their parts, physiology, their separation is somewhat artificial due to the close interrelation of the function and structure of organisms (New Encyclopaedia Britannica, 1984).

Urban morphology is the systematic study of the form, shape, plan, structure and functions of the built fabric of towns and cities, and of the origin and the way in which this fabric has evolved over time (Small & Witherick, 1986; Clark, 1985; Goodall, 1987). For Gordon (1984:3), morphology is formed of "plots, buildings, use, streets, plans, townscapes". It is dealt with mostly in urban geography which studies spatial aspects of urban development from two inter-urban and intra-urban viewpoints. In the case of the latter, "urban areas are studied in terms of their morphology, producing concepts and generalizations related to the character and intensity of land use within the urban area and to the spatial interactions of one part of the urban area with another, i.e. internal structure and processes" (Goodall, 1987).

Until the 1960s, the main concern of urban geographers was the internal structure of the city focused on morphology which, mostly being historical, plotted the ages and types of buildings and identified different historical components of town plans (Dennis & Prince, 1987). Urban morphology in its most active period was emphasizing the classification of subregions within individual cities in relation with the phases of urban growth (Herbert & Thomas, 1982).

Urban morphology in its homeland, the German-speaking world, was flourishing in the inter-war years and remained an integrated part of urban geographical research in the post-war period (Whitehand, 1987). Architects and historians as well as geographers had contributed to develop urban morphology. This line of central European research was introduced to Britain mainly through the work of M.R.G. Conzen (1960), who tried to explain the present structure of a town plan by examining its development.

In the 1960s with the rise of interest in functional classification and the economic bases of urban systems, urban morphology was severely criticized as being mainly descriptive, lacking in good measurement techniques and failing to develop a general theory, and focusing merely on the observable and the inanimate (Herbert & Thomas, 1982).
After a period of quiescence, research activity in urban morphology has renewed since the late 1970s. In its revived form, urban morphology has focused on town plan analysis and building form. A theoretical framework was worked out which referred to the creation of morphology by "actors" in "stages" (Gordon, 1984). Whitehand argues that for a more realistic perspective, it is necessary to "set individual decision makers into a wider framework of morphogenetics, economics, property interests and artistic considerations" (1987:288). He sums up the research questions of one of the most important lines of investigation in British urban morphology in the 1980s as dealing with the location of the individuals and the firms involved in the development process, their relationship with each other, and the implications of these relationships for the change of building form. These are the questions in response to which new studies have been carried out (Larkham, 1986).

With the focus of research on the social geography of the nineteenth-century cities, they were studied on the basis of the ecological theory of the Chicago School and social area analysis (Dennis & Prince, 1987). The spatial structure of the cities were reconstructed and compared with a few standard types: Sjoberg's pre-industrial city, Burgess's concentrically zoned city, and Hoyt's sectors. It was then possible to locate the city in question somewhere along a transition from "pre-industrial" to "modern". In the 1970s, the studies being still principally descriptive, the observed changes were accounted for only by the most general of processes such as modernization. But over time, the concept of modernity has become less unilinear and more historical through the observation of modern attitudes, perceptions, political philosophies and forms of class consciousness together with the spatial patterns (Dennis & Prince, 1987).

In Germany, recent studies on urban growth during the nineteenth century often proceed to investigate processes and the agents, political, functional, social, and economic, that lay behind such urban expansion (Denecke, 1987). Detailed studies have focused on urban fragments, their morphogenetic and functional change, especially during the nineteenth and twentieth century. Individual sections of towns, as representatives of the whole, are studied reflecting the processes that the town underwent. The researcher is thus allowed to go into detail and to follow threads, that finally again knit everything together on a more general and theoretical level.

With these characteristics, urban morphology seems to provide the necessary frameworks for the study of urban form. Nevertheless, there are some major issues which it leaves unaddressed. Although focusing on the operation of agencies within
certain structures, it fails to address the general processes and contexts in which these operations are carried out. The extensive empirical studies of this line of enquiry are not often concerned with the understanding of social structures. The weakness of these links to the social structures has meant that the social dimensions of the urban morphological analyses are weakly developed. This implies that, despite its apparent attempts to link urban form with wider societal contexts, it has only concentrated on certain aspects of urban form in relation to certain characteristics of the development agencies.

1.1.2.3. The Way Forward

The review of the design approach to urban form suggested that, in order to trace the relationship between urban form and wider societal processes, the development process, in which urban fabric has been produced, should be studied. It was in a search for the social dimensions of this process that urban geography’s approach to urban form has been reviewed.

The three conceptual trends of urban geography, reviewed earlier as quantitative, subjective, and instrumental, tend to explain the patterns of human behaviour along two main lines. These explanations underline the freedom of individuals pursuing their objective or subjective interests, or the lack of such freedom due to the structural constraints they have to comply with.

The dichotomy between structure and individual is a central problem of the main theoretical approaches to sociology as reflected in functionalism and structuralism on the one hand and hermeneutics and the various forms of "interpretive sociology" on the other (Giddens, 1984). Nevertheless, as Giddens rightly observes (1989:704-5), the differences between the two views can be exaggerated. He argues (1984) that social structures, as recursively organized sets of rules and resources, refer to structural properties of social systems. The structures, whose transmutation or continuity leads to reproduction of social systems, are not external to individuals and exert constraining as well as enabling powers upon them. There is a process of "double involvement" of individuals and institutions: "we create society at the same time as we are created by it" (Giddens, 1982, 14).

Acknowledging the double involvement of individuals and structures has some important implications. It implies that none of the valuable insights which the reviewed
trends have offered are to be discarded. Bearing in mind the limitations that their determinism has put on their approaches it will be possible to take advantage of their developments.

On this basis, those trends which emphasize the supremacy of the individual in social processes, such as the quantitative and subjective approaches in urban geography, will be of special value when the actions of individuals are being studied. Simultaneously, the trends which stress the importance of social structures, such as the institutional approach, will be helpful in understanding the social processes from a wider point of view. The crucial point, however, will be to acknowledge the importance of each of these trends without ruling out the importance of others. This acknowledgement will, therefore, be a major contributor to an approach which identifies a social process as an interaction between human agency and social structure.

At the level of structures, for investigating the way these structures influence the agencies by framing their actions, the concepts of commodification of space and the flow of resources into the built environment are of fundamental importance in the study of urban process. The concept of the production of space was introduced by Lefebvre (1976; in Burgel et al, 1987: 29-30), "space as a social and political product, space as a product that one buys and sells". It was based on the notion that commodification, which is basic to the analysis of capitalist order, is extended to space to entangle the physical milieu in the productive system of capitalism as a whole. He further argued that the organization of the environment and the society, and the layout of towns and regions are all dependent on the production of space and its role in the reproduction of the socio-economic formation.

The process in which this commodification takes place is illuminated by Harvey (1989, 1985, 1982). He recognizes the contradictions within the primary circuit of capital, where the capitalist production process takes place. Here, the drive to create surplus value by competing capitalists leads to over-accumulation. This becomes manifest in over-production of commodities with falling prices and surpluses of labour and capital. Trying to overcome the contradictions, these extra resources are switched into a secondary circuit of capital, where investment is made in the built environment creating a whole physical landscape for purposes of production, circulation, exchange, and consumption. There is also a switch of flows to the tertiary circuit of capital where investment is channelled to research and development and to improvement of labour power. The switch is, however, cyclical, due to the cyclical nature of over-
accumulation, and temporary, due to the crisis rising from over-investment in built environment. The implications of these contradictions for the landscape created under capitalism are, therefore, devaluation of structures to be put to use later and destruction of the existing landscapes to open up fresh room for accumulation. It should be mentioned, however, that these patterns, although generally applicable, find different forms in different social systems.

Bearing in mind these structural frameworks, it will be then possible to move into the level of agencies. Here the concepts developed by the quantitative approach, according to which the socio-spatial patterns are the outcomes of competition between individuals, will enable the study to look at the dynamics of agencies' actions. Also, the developments of the subjective approach, which focus on the psychological and cultural aspects of an action, will help to further the understanding of the processes in which urban form is being produced.

Although such combination of these separately developed conceptual frameworks would address the two required levels of analysis, the agency and the structure, they are not yet referring to the dynamic interrelation between the two. It appears that a special attention should be paid to this interrelation which Giddens (1984; 1982) identifies to be of central importance in the social processes.

To tackle this important issue, it will be needed to try to investigate the interaction of the human agency, individual or collective, and the structures, resources, rules, and, as developed by Healey and Barrett (1990), ideas. These are the resources which the agencies draw upon, the rules they acknowledge, and the ideas they assert in the course of their action.

Furthermore, it is important to investigate the rationalities with which the course of action is being undertaken by the agencies. This notion draws upon the theoretical developments in social philosophy through the critical theory of Jurgen Habermas (Dews, 1986; McCarthy, 1978). He has developed a communicative model of action and reality which attempts to address, at the same time, all three objective, social, and subjective issues. In this way, this model offers an alternative to the models which aim to focus only on one of these issues. These models are identified as the teleological model in which the actor relates to an objective world cognitively and volitionally as rationalized by "truth" and "success"; the norm-guided model in which the actor is related to a normative, social context as rationalized by "normative correctness" or
legitimacy; and the dramaturgical model in which action is related to the subjective world of the actor as rationalized through "truthfulness" or "authenticity" (White, 1988).

In the development process, these notions play an important role. The instrumental rationality of the teleological model is the channel through which the actor, the development agency, seeks self interest from the course of development. The norm-guided model offers a social rationality for this course of action, in which a social, as distinct from individual, gain would be resulted. These two rationalities, instrumental and social, are especially important notions which, along with the subjective rationality of the dramaturgical model, are needed to be identified if any course of development, as a social process, is to be thoroughly understood.

The study of development process and its relationship with urban form, however, would not be complete without the study of the contexts in which these processes take place. Therefore, there is an emphasis to be put on the social systems of which the studied structures are a constituent part, parallel with the Giddens' recognition of differentiation between structure and system (1984). In the study of the form of the urban fabric, in addition to this social context, it is obvious that physical context also plays an important part.

1.1.2.4. Approaches to Third World Cities

The contemporary development of urban process and form is directly linked to the transformation of societies in the modern world. Although these processes have different patterns and dynamics in different societies, they are, essentially and increasingly, interrelated. That is why the conceptualization of this transformation in the context of the 'less developed' countries of the Third World has focused on the relationship of these societies with the 'developed' countries of the West and their transformation. Since the selected case of Tehran is located within the context of the former, it is necessary to take into consideration these transformations and their inter-relationships.

1.1.2.4.1. Conceptual Bases

The nature of change that has transformed the modern world is addressed by two contrasting theories of industrial society and capitalist society. Associated with these theories, in the context of the Third World, are modernization theory as distinct from
imperialism, dependency, and world system theories, as briefly examined in what follows.

1.1.2.4.1.1. Industrial Society and Modernization Theory

The concept of industrial society was rooted in nineteenth century social thought and re-emerged as the dominant post-war approach. It saw the most significant set of changes in the modern world as a progressive movement in history by transition from traditional, agrarian societies into modern, industrial ones characterized by institutionalization of class conflict and liberal democrat states (Giddens, 1981). The traditional society usually meant to include everything left behind after the beginning of the industrial age. The theory saw the patterns of development as essentially the same in all the industrializing societies and the modernized society which results from this "progress" as similar (Strasser & Randall, 1981).

With respect to the non-industrialized societies, the concept of industrial society is closely linked with modernization theory. This theory views the world as progressing from underdevelopment to development on the pattern provided by the modern industrial societies of the West. When addressed to the Third World, it has led to the conceptualization of underdevelopment as an original state whose characteristics were traditionalism and backwardness, features which should be abandoned to achieve the development and modernity of the advanced nations. The change from traditional to modern was expected to take place through the diffusion of capital, technology, values, institutional arrangements and political beliefs from the West to the traditional societies (Slater, 1986). Modernization is defined by Moore (1963:89) as, "the 'total' transformation of a traditional or pre-modern society into the types of technology and associated social organization that characterize the 'advanced', economically prosperous, and relatively politically stable nations of the Western world".

Urbanization experience in underdeveloped countries is seen by Reissman (1964) as a replication, though more concentrated and uneven, of that of the European nations at the time of their urban industrialization. The similar points between them such as the rural-urban migration process, the rapid growth of cities, and the social problems of European cities in the nineteenth century are emphasized. What is called for is a balance between the factors that complement each other in the development process, namely urban growth, industrialization, the presence of middle classes, and nationalism. Any imbalance between them is conceived of as the source of social problems and a hindrance to progress.
When it was revealed that such replication has not been viable, the difference between the experiences of developed and developing nations has been investigated. It is said that differences in the pace and dimensions separate the urbanization of the earlier urbanized countries from that of the developing World (Todaro, 1984; Beier, 1984). The four important factors which have made the experience of urbanization in the developing countries different from that of the now developed countries are identified by Cohen (1984) as: the higher rates of population growth; the declining available agricultural land in some countries; the lower costs of transportation and communication which facilitates migration; and the more restricted international migration.

Within the context of the Third World, the traditional-modern dichotomy has been translated into the notion of urban-rural duality in which the city practises a positive diffusing influence as a catalyst of transformation. Cities were viewed as centres of development and modernization as against rural areas as zones of economic backwardness and cultural traditionalism. With the manifestation of the contradictions of the socio-economic development in the Third World cities, concepts of "over-urbanization", "hyper-urbanization", and the "pathology" of urban growth echoed the idea of "breakdowns" in the modernization process. The city now was judged as a problem and urbanization as excessive (Slater, 1986: 9-10).

The modernization theory is open to criticism from at least two points: firstly, that it relies on the categories invented in response to Western experience and viewed as constants of every possible society, a pattern which is unable to account for the historical specificity of social development in the Third World (Slater, 1986). Secondly, that, by calling for the Third World societies to be transformed on the pattern of the industrialized countries, it has served to some degree as an ideological defence of the dominant Western capitalism over the world (Giddens, 1981).

1.1.2.4.1.2. Capitalist Society and its Expansion

The concept of capitalist society, also developed in the nineteenth century, has been the main opponent of the concept of industrial society. It views capitalism as both an economic enterprise, with two fundamental, conflicting elements of capital and labour, and a type of society, which is subsequently marked by the existence of a distinct class system. The changes in the modern world result from a transition from pre-capitalist, feudal societies to capitalist ones. This has occurred through accumulation of capital
and formation of wage labour, which have accompanied the process of industrialization and the rise of the capitalist class to power. The two crucial characteristics of the capitalist societies of the West is that they are highly industrialized and that the largest part of their means of economic activity is under private ownership and control (Miliband, 1969; Giddens, 1982).

As regards the relationship of these societies with the rest of the world, various views have been developed to address how capitalism, with its characteristic drive for expansion, has spread across the world (Giddens, 1989). The theory of imperialism views the external expansion of capitalism as resulting from its search for new markets, raw materials, and labour power, pressures which led to the conquest and subjugation of other peoples through colonialism. The theory of neo-imperialism traces how, after the demise of colonial empires, the control of the key positions in world trade and the influence of large corporations operating on a global basis have perpetuated the privileges of the capitalist industrialized economies.

Linked to the theory of neo-imperialism and a substantive challenge to modernization theory, the dependency approach was developed by a number of Latin American intellectuals. It rejected the inherent notion of modernization theory that the Western development and the Third World underdevelopment were separate phenomena, and that the contact and influence of the former were necessarily beneficial for the latter. The negative effects of this contact was reflected in the "creation of underdevelopment", "continuing forms of external dominance", or the continual "siphoning off of the surplus" (Slater, 1986).

Roberts (1978:11-13) looks at the modernization concepts of transition and convergence as having limited usefulness in understanding the experience of urbanization, leading to an overlooking of its interdependent nature. "Urbanization is essentially the product of capitalist development and expansion", which has occurred unevenly over different historical periods and has affected most areas of the world. He argues that development should be seen as "an interdependent process in which some countries and regions acquire a predominant place within the division of labour". As a result of these uneven relations, the dominated partner is being used as a source of cheap raw material or foodstuff and as a market for manufactures. This situation is expressed by the two related concepts of dependency and core-periphery.
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The most sophisticated form of the attempts to interpret these relationships is the world system theory. According to this theory, with the development of capitalism from the sixteenth century, a global system has emerged comprising a centre, a semi-periphery, and a periphery of exploited satellites. The capital accumulation flows from the satellite nations to the core through the unequal trading relations, which result in underdevelopment (Laite, 1984). The constant economic expansion of the world system is derived from the capitalism which "as an economic mode is based on the fact that the economic factors operate within an arena larger than that which any political entity can totally control" (Wallerstein, 1974:348).

From the viewpoint of modernization theory, the difference in the pattern of urbanization of the Third World cities compared to the advanced industrial societies tended to be attributed to their failure to conform to the Western model. New perspectives saw this difference as stemming from "their late entry into the global capitalist economy and dependence on advanced industrial societies for capital, technology, export markets, etc" (Safa, 1982:3). The fundamental changes which occurred in their organization and structure of production and distribution, and in labour force were due to the fact that the penetration of capitalism in the Third World undermined its pre-capitalist modes of production.

The creation of underdevelopment derived from the effect of the Western merchant capital preventing the indigenous economic development and from the effect of political control and deliberate confinement of industrial production to the West. The societies which were drawn into the orbit of the world economy were confronting the erosion of their cultural, economic, and political distinctiveness. This led to the emergence of a duality in these dimensions through the existence of two separate but related sets of institutions within these societies (Giddens, 1982).

Although the studied case of Tehran has never been a colonial city, as Iran was not colonized, it has been subject to colonial influences and relationships. As the historical development of the country since the nineteenth century shows, there has been a gradual and forceful integration of Iran into the world market as a peripheral partner. On this basis, the frameworks provided by the studies of capitalism and its worldwide expansion are of special assistance in the study of Tehran.
1.1.2.4.2. Approaches to Urban Form

In the context of the Third World, few studies have been carried out by urban geographers (Potter, 1985). In spite of an increasing interest from the part of geographers, there is no model of the Third World city, as compared to the classical models of the structure of the Western city. Scargill (1979:182) suggests that, "in absence of a common frame of reference it is tempting to view even the most culturally diverse places in terms of their conformity with, or departure from, some Western norms". This is a visible notion in most of the studies within the framework of modernization theory.

From the viewpoint of modernization theory, the structure and the form of the Third World cities, like their other institutions, belonged to pre-industrial and traditional societies and were doomed to disappear on their way toward industrialization and modernization. Only single physical elements of urban form which were evaluated as being of historical interest were considered to be worth preserving. This approach led to extensive schemes of urban redevelopment in both developed and developing countries, which in both cases were confronted by serious reactions. The attitude of modernization theory towards the urban form of the Third World is in line with the attitude of the modernist thought in architecture towards the urban form of the past: modernization of fabric was required in order to modernize the society (Le Corbusier, 1971).

The dependency theory, as a counter-movement to modernization theory, focused on the problems of internationalization of capitalism and its impact on the development process of the Third World. Even though it claims not to ignore the internal structure of the city (Safa, 1982), it has been less interested in the study of urban form. However, it has been concerned with the physical expressions of poverty and inequality as reflected in housing conditions and squatter settlements.

With regards to the world system theory, there have been attempts to address both dimensions of urban form and societal developments (King, 1990). Urbanism and urbanization in core and periphery are all seen as interdependent parts of the same process. On this basis, this view has been able to show how "colonial cities were the major links between core and peripheral economies..., articulating the flow of capital, people, commodities, and culture that flowed between them" (King, 1990:7).
It has been argued that the humanistic and behaviouralist approaches have been neglected in the Third World studies (Chokor, 1986). Nevertheless, there have been studies stressing the role of values, behaviour, and institutions as the determinants of urban form resulting from the impact of colonialism on urban development (King, 1976).

Consistent with the urban debates in the early years of the Soviet Union, an anti-urban approach has emerged in some of the socialist Third World countries. What they share is the distrust of the large cities as the product of capitalism. The central business district is to be de-constructed and small cities, as the cities of workers, are preferred. This approach, with different degrees of implementation, was favoured in countries such as Cuba, Vietnam, and Campuchea (Bater, 1980; Lefebvre, in Burgel et al, 1987; Government of Vietnam, 1985).

Within the context of the Middle Eastern cities, all the social institutions as well as urban structure and form were compared to the historical Western norms and found to be arrested in their development (Von Grunebaum, 1981; Weber, 1960). Street patterns were called "inorganic", "anarchic", and a "confused maze" (De Planhol, 1970; 1968). As a consequence, their erosion and the introduction of Western urban features were welcomed (Clarke, 1963).

Only later were some attempts made which cast doubt on the prevalent approach to urban phenomena (Hourani, 1970; Brown, 1973; Scargill, 1979; Lawless, 1980). However, the concepts of traditional and pre-industrial society still played a considerable role (Costello, 1977). This counter-movement has led to an appreciation of the cultural heritage (Ettinghausen, 1973; Fathy, 1973), and the search for regionalism and cultural identity (Germen, 1983).

These studies add two more aspects to be taken into consideration, both regarding the determinants of urban form. The first aspect refers to the impact of the Western processes and ideas on the Third World societies and their cities in the worldwide expansion of capitalism. The second aspect deals with the response of these societies to these processes and ideas as reflected in the way the form of their cities are produced and used.

These conclusions support the notion, referred to earlier, that a study of the contexts in which the development process takes place is of crucial importance. The social
structures and agencies tend to have different natures in different social systems, hence a different operation system and a different urban form.

In general, the review of the literature has suggested that, in the search for influences on development process and urban form, some key areas should be emphasized. Attention should be paid to the way urban fabric is being produced through the development process which, like other social processes, is the outcome of a double involvement of agencies and structures within a certain context. Focusing on such interaction would enable the research to take advantage of the insights offered by different lines of inquiry in urban geography and architecture. These are the themes which form the bases of the research methodology, to be developed in the next section.

1.2. Methodology

In order to find a response to the main question of the research, as to why a particular urban form is as it is and how is it likely to change, this section attempts to work out an analytical framework and a methodology for the study. This will be done with reference to the reviewed literature on the subject and the adopted definition of urban form. The developed framework will then be examined in the context of the case study of a particular urban form. During the course of this study, both a response to the main question of the research and an evaluation of its analytical framework will be sought.

1.2.1. Conceptual Bases of the Research

The research is basically founded on four interrelated notions: that urban form has both physical and social dimensions; that the study of urban form is best made possible by tracing the process of its development; that the development process, as a social process, will be best understood by addressing both individual actions and the structures which frame these actions; and that the understanding of this process will not be complete without addressing the social and physical contexts in which it takes place.

The first notion is consistent with the approaches in urban geography and architecture which try to address both physical and social aspects of urban fabric simultaneously and focus on the dynamic interrelationship of these aspects.
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The second notion, the necessity of the observation of the development of urban form, stems mainly from the traditions of urban architecture and urban morphology, as reviewed earlier, which have developed the idea of the historicality of urban fabric. Another source of this notion is the tradition in social sciences which tends to link space with the wider context of general societal processes. It also stems from the notion which regards the development process and urban form as both an outcome and a contributor to the production and reproduction of social systems.

The third notion, the recognition of both structure and action in the development process, stems mainly from the theoretical approaches in social sciences which avoid the determinism associated with stressing the supremacy of individuals or structures in social processes. It also stems from the fact that all the three identified traditions in urban geography, quantitative, subjective, and institutional, have provided valuable insights into the process, which should not be disregarded.

At the structural level, this will, therefore, enable the research to draw upon the notions of the institutional approach in urban geography which focuses on the frameworks which condition human behaviour. At the individual level, it will be possible to take advantage of the insights of both quantitative and subjective approaches. At this level, it will also be applicable to dwell upon the tradition in social philosophy which tends to approach a research programme with a combination of three models of action and rationality to be able to address objective, social, and subjective issues simultaneously. These models will enable the research to investigate the forms of rationality with which the development is being undertaken.

The fourth notion, the necessity of the study of the social and physical contexts, stems from the fact that the urban fabric is, due to its nature, fixed in a certain location. The development process takes place within a locality with certain social and physical characteristics. In addressing the disparity between localities, the research relies upon the notions in social science which focus on the emergence and expansion of capitalism. It also relies upon those architectural studies which are concerned with regional characteristics of urban form.

On these bases, attempts will be made in this thesis to analyse the development process by identifying its component parts, the way they interact, and the impact of this on the urban fabric and its form. It is argued that, in a development process, there are "development agencies" who operate through certain "development factors" within
interrelated social and physical "contexts"; and that any configuration of urban form is directly affected by variations of these component parts of the development process and their interrelationship.

This constitutes a conceptual framework to approach specific urban fabrics to investigate the causes of their existing and changing forms. It shares the idea of agencies with the framework developed by British urban morphologists. However, the difference lies in the recognition in this approach of the development factors and its emphasis on the broad contexts in which the development takes place.

The study of case has been carried out in order to put the developed conceptual framework against an empirical background, and to examine the validity of the framework in dealing with the main question of research. Before that, however, it is necessary to elaborate the methodology and the approach to the case study.

1.2.2. The Process of Production of Fabric as a Part of the Historic Creation Process

In order to have a better understanding of the process of historic creation of the city, it is necessary to focus on each section of this process and trace its relationship with the previous and subsequent sections. It is possible to confine this observation of urban form to the study of architectural styles or any other single aspect of urban form. However, an approach which attempts to find the rationale of particular configurations of urban form would require to observe it in a wider, dynamic context. It is the study of the process of production of urban fabric in each period which would provide this wider context. Through this study, it would be possible to see the link between a particular urban form and the processes which have produced it. These processes are themselves a part of the general societal characteristics. Therefore, through tracing the production of the urban fabric, it becomes possible to explore the relationship between urban form and the general societal trends.

It should be noted that the notion of change of urban form is, at this level, inherent in the notion of production of urban form as an outcome of change in one or more of the characteristics of the production process.
1.2.3. The Process of Production of Urban Fabric and the Impact of its Components on Urban Form

To reach a better understanding of the production of urban fabric, it is necessary to put forward a set of basic questions about the development process. These questions are when?, where?, how?, and why? an urban fabric has been produced. By these questions, it is expected to analyse the process through the agents of production, the development factors, and the concrete context in which it takes place. In response to the proposed questions, an attempt has been made to stress the link between each issue and urban form.

However, it should be noted that, for a better adaptation of this framework to any concrete situation, a rather large degree of flexibility is required. This is so because, for example, the answers to some questions might be given through other responses. Despite the possibility of overlaps, however, it is argued that it is analytically useful to identify them separately.

1.2.3.1. When is it produced?

Looking at the different sections of the historic periods in which the city has evolved is essentially an answer to the question as to when a particular urban form has been produced. It is important in that it refers to a concrete period with certain societal characteristics which may or may not embody a change of urban form from other periods.

1.2.3.2. Where is it produced?

The answer to this question puts the particular urban form in a concrete context. This context is a complex combination of different contexts with some overlaps, some of which have more bonds of locality than others. These contexts might be divided into physical and social environmental contexts in order to address both of these dimensions in urban form. These contexts provide the preconditions for the agencies in their operation, preconditions which are themselves set or influenced by a larger combination of agencies than merely those involved in the development process.

1.2.3.2.1. Physical Environmental Context

This context is important for it relates the form of the fabric to the physical environment in which it was created, and by which it was affected. In other words,
these are the prerequisites for the formation of urban fabric, or have a large impact on it.

The physical context refers to both natural and built environments in which a particular urban fabric is being produced. Classifying built environment as a constituent part of the physical context does not mean to deny its social implications. Indeed, the built environment is here considered as the meeting point of the social and physical environments. This classification, however, aims at analytically separating the members of a society from the physical artifacts which accommodate them. In this way, it will be possible to trace the interaction between these two dimensions.

1.2.3.2.2. Social Environmental Context

This context is itself a complex ensemble of factors and processes which are crucial in the formation and organization of a whole society. It has a direct impact on the urban phenomena, one of its aspects being its form. For example, the form of capitalist industrial cities has been different from that of feudal settlements and trading centers. Also there has been a difference between urban form in the advanced capitalist countries and the countries which are only partially integrated into capitalism. The impact of these different contexts on urban form, if only traced through the patterns of urbanization and population growth, seems to be very considerable, as noted in the above literature review.

This context also refers to the norms and values of a group of people, which directly affect the characteristics of the environment they build for themselves or cause to be built. Different norms and lifestyles will obviously require different built forms.

1.2.3.3. How is it produced?

The response to this question should refer to the development process itself. This is a process in which a group of agents with a set of instruments are involved in the act of development. The two parts of the process answer the questions as to by whom and with what the fabric has been produced.

1.2.3.3.1. Development Agencies

The idea refers to human agency, i.e., the people who, individually or in the form of groups and organizations, are involved in the development process by organizing the conversion of land and property from one physical form to another (Healey, 1990). It is
Chapter One

CONCEPTUAL FRAMEWORKS OF THE RESEARCH

the study of the nature, purpose, scale, and organization of these development agencies, in both public and private sectors, which explores their impact on the urban fabric they produce and the form it takes.

1.2.3.3.2. Development Factors

The double involvement of development agencies with development factors constitutes the development process. Development factors are, therefore, component parts of development process and, due to their structural dimensions, might be classified as resources, rules, and ideas. Resources include capital, labour, land, building materials, and technology. Rules and ideas include the planning system and concepts of space. Nevertheless, each of these development factors has rules and resources of its own, whose study is necessary in the understanding of the development process and its physical product.

Development factors are structural properties of the social and physical contexts. Physical, because the development process is one in which certain physical entities, such as land and building materials, through a set of mediations, are put together in a composition to create a new physical entity. Social, because this process is carried out by social agencies; because each of the physical entities have social attributes through their patterns of production, exchange, and valuation; and because of the nature of the non-physical development factors, such as planning and spatial concepts.

The development factors have both enabling and constraining dimensions. In their enabling capacity, they are used as the instruments of production by the development agencies. In their constraining dimension, however, they frame the operation of these agencies. Different development agencies might come across different facets, or a different combination of facets, according to their capacities and nature, as well as the circumstances. For example, the planning system is an instrument of the state in the control and production of space, while it is also a framework for the individual development agencies. Similarly, a development agency uses finance as an instrument in the process of development, at the same time as being framed by the mechanisms of the financial system.

It should be noted that the development factors mentioned here are the most directly related to development process and, as far as urban form is concerned, exclude those factors which might have an indirect, or less effective, stake in the process. The
criterion used to measure this, as for the identification of the development agencies, has been their immediate involvement in the physical process of development.

1.2.3.4. Why is it produced?

A response to this question overlaps with the study of the development agencies and their purpose of development. The study of the form of rationality on which the agencies base their operation provides an elaboration of the response. On this basis, the purpose of the production is a material gain, by an individual or an organization, either by use or exchange of the development; a social gain, either by the commitment of an individual to social norms or by that of a public agency carrying out its duties; or merely a mental satisfaction.

1.2.4. A Model of the Development Process

What has been identified so far as the component parts of the development process are illustrated in the Figure 1.1. As it shows, it is a simplified model of the process of production of urban fabric. In it, each of the component parts of the process, i.e., development agencies, development factors (resources, rules, and ideas), and their contexts are shown in both aggregate and disaggregate forms. The succession of the shaded figures (Figure 1.2) refers to both the development process and to the chapters of the thesis. Therefore, the main figure will appear at the beginning of each chapter with a different shading to show the relation of each chapter to the overall structure of the work.

The figure is designed to represent a social process, i.e., the development process, which requires a movement to be depicted, hence the overall form of an arrow. The two main constituent parts of this process are the social and physical contexts. The model, therefore, is divided into two parts each representing one of these contexts. Where these two, social and physical, contexts overlap is the built environment.

The development factors, as structural properties of these contexts are shown as framed within them. Therefore, the resources are shown as stemming mainly from the physical environment but also incorporated into the social environment. Similarly, rules and ideas are shown as mainly stemming from the social environment but also locating within the physical environment.
Figure 1.1. A Model of the Development Process

Physical Environment

Resources

Development Agencies

New Development

Rules, Ideas

Built Environment

Social Environment

Figure 1.2. Component Parts of the Development Process

Development Process

New Development

Physical (Natural) Environment

Physical (Built) Environment

Social Environment

Development Agencies

Development Factors: Resources

Development Factors: Rules, Ideas
Where these two, the resources and the rules and ideas, overlap, the development agencies are shown to be involved in the production of new urban fabric.

1.2.5. Case Study

After the development of the conceptual bases of the research and its methodological approach, it is argued that the main question of the research will be best answered through the conduct of a case study. The circumstances in which case studies are preferable are outlined by Yin (1989:13) as: when "how?", and "why?" questions are being posed, and when the focus of study is on "a contemporary phenomenon with some real-life context", in which "the investigator has little control over the events".

1.2.5.1. The Case of Tehran

The developed conceptual framework is applied in the study of a particular case, the city of Tehran, to examine the extent of the validity of the framework, as well as to find the answer to the question as to why Tehran's urban form is as it is today. The case study is presented so that it starts with a description of Tehran's urban form (Chapter Two) and then, on the basis of the developed frameworks, the analysis of the development process and its component parts is given (Chapters Three to Seven). This will result in an explanation of the characteristics of urban form through the way urban fabric has been produced (Chapter Eight).

1.2.5.2. Study of Urban Form: Time and Scale

The adopted definition of urban form requires a view of the subject as a combination of various scales of urban fabric with both its social and physical dimensions. The adopted conceptual framework also requires the study of urban form in the process of its making. Therefore, the urban form should be studied at various scales, regarding its social and physical dimensions, through time.

Due to the patterns of availability of statistical data in Tehran, its urban form has to be studied at two, interrelated scales: the internal structure of the city and the urban quarter. At the citywide level, urban form has been traced at its different stages of development from the 1860s onward, when the form of urban fabric has started to change dramatically in Tehran. At the quarter level, seven sample quarters are chosen to both represent the various phases in which they have been built, and to extend the study to the smaller scales of urban form. The level of individual buildings is studied.
within these sample quarters. The overall result, hence, includes a description of urban form in Tehran at different scales and in different periods. The main task of the research, therefore, will be to explore the rationale and the main determinants of this form.

1.2.5.3. Techniques of Research

In Chapter Two, the study of urban form at different scales has been carried out by using quantitative approaches from both the traditions of spatial analysis and urban morphology. In the study of the internal structure of the city, in order to provide stronger empirical evidence, a combination of uni-variate and multi-variate forms of data analysis has been adopted. The former concentrates independently on the available data, whereas the latter uses data classification techniques.

Data classification techniques, using cluster analysis, were developed for the classification of census data for areal units (Openshaw, 1982). They try to find clusters or groups of objects which are similar to each other. An assessment of the characteristics (variables) used to describe each object provides the basis of the measurement of similarity. This is essentially a descriptive and explanatory technique whose basic approach is unavoidably subjective. Ultimately, it is the user who should decide what classification best approximates what is believed to be the "best" result (Openshaw, 1982:5). Nevertheless, it is capable of providing useful results when coupled with an explicitly clear purpose and employment of prior available information.

The former point of having a specific purpose, which here is the study of urban form at citywide level, has been crucial in reducing the number of possible clusters. The latter point, employing prior information, has resulted in attempting to use a uni-variate analysis to both providing the background and enhance the outcome of the cluster analysis.

In the process of uni-variate analysis, which has helped to simplify the spatial complexity of the distribution patterns, each variable is separately mapped to be taken as an independent indicator for ranking of areal units. This has been made possible due to the limited availability of census data, i.e, smaller number of variables, for this spatial scale.
Thus, with combining the two forms of analysis, the statistical objectivity of cluster analysis is utilized to extend from the information provided by separately discussed properties of each areal unit to produce a multi-factor interpretation. At the same time, the cluster analysis has put forward a panoramic view of the distribution patterns, emphasizing these shared characteristics of individual variables.

The study of the urban quarters has been based on the detailed calculation and mapping of the available data at this level. The results of both scales of analysis are presented in both the aggregate and disaggregate forms. The study at the levels of individual building, and also block, has been carried out mostly within the framework of the quarters.

Apart from these quantitative techniques used in the study of urban form, qualitative analysis of information from various sources has been applied in the study.

1.2.5.4. Sources of Information

The information for the case study are provided from three main sources. In the analysis of the characteristics of Tehran's urban form in Chapter Two, the census data and various official records have been used. Some of the sources of data and information include MAI (Iran's Statistical Centre), BMI (Central Bank of Iran), VOED (Ministry of Treasury and Economic Affairs), and VMS (Ministry of Housing and Urban Development). Further explanation about these may be found throughout Chapter Two, and in the Appendix 2.1.

The second source of information is provided by the published and unpublished materials about Tehran and about Iran in general. These include descriptive and quantitative as well as analytical and qualitative materials, published by both government and the private sector, in Persian and in English languages. The subject matter of these materials being mostly Iran's history, geography, economics, sociology, architecture, and planning, they have provided the bases for the explanation of Tehran's urban form.

The third source of information is the personal knowledge of the author from the case, as provided by a lifetime residence in Tehran of which fourteen years have been spent in higher education and professional practice. This source has been mainly used in support of the data and information from the other two sources. The use of this source has also been necessary in the provision of information where other sources fail to
provide the required information. An example is in the analysis of the development agencies in Chapter Five, for which almost no documented source is available.

However, it is not always possible to rely on alternative sources when there is a scarcity of information about a subject. This has been the case with information on the development process in the sample urban quarters. Therefore, due to the scarcity of information about the contexts and the development process at the level of urban quarters, Chapters Three to Seven mostly rely on the available information at the citywide level. These are mostly studied in their broad dimensions and their impacts on urban form have been traced. This is in line with the approach of the research which tends to investigate the wider societal processes. However, where available, the information on the sample quarters has been used.
Chapter Two

TEHRAN'S URBAN FORM
Tehran, the capital city of Iran for the last two hundred years, has undergone rapid and considerable changes. In addition to being the seat of the power, it has become the largest concentration of people and the most important urban area of the country. Its population has risen from only fifteen thousand in the 1780s to more than six million in the 1980s, far above the other large cities of Iran. It also holds the economic power by being the largest concentration of production and consumption in the country. The urban fabric which has been produced to accommodate the Tehranis and their activities has increasingly expanded, taking complex forms.

In order to open the case study of Tehran, this chapter intends to set the scene. By providing a description of a particular urban form, that of Tehran, it relates to one side of the main question of the research as to why a particular urban form is as it is. It therefore provides the basis upon which the rest of the research lies. To account for social and physical dimensions of urban form at various scales, the chapter is divided into two sections, the first dealing with the urban spatial structure and the second with the morphology of urban quarters.

The concluding section singles out the main characteristics of Tehran's urban form by combining the findings of the two sections, putting forwards the main questions which should be answered in the later parts of the research. In the later parts of the research, however, the analyses and explanations will not be based on a distinction between these two levels of urban structure and urban quarters. The urban form, as defined in Chapter One, will be referred to as a spectrum of large and small scales. This is mainly due to the scarcity of the required information at the level of urban quarters and the intention of the study to focus on general characteristics of urban form.

Further information on the areas and quarters of the city used in this chapter may be found in the Appendices to Chapter Two, which are divided into four sections: 1. sources of information; 2. data and maps of urban structure and change in the 1980s; 3. list of variables and the results of cluster analysis, 1980, 1986; and 4. data from the sample quarters, 1980.

2.1. Internal Structure of the City

This first section seeks to illustrate Tehran's spatial structure mainly through the analysis of data from the 1986 national census (MAI, 1987a) and the 1980 Tehran
census (MAI,1981) (Appendix 2.1). The spatial structure of Tehran is analysed here in two phases. The first phase is to try to find the most important data, social and economic as well as physical, for the city in a disaggregate form, so that a spatial patterning of these data would be possible. The second phase, as reported in this chapter, is then to illustrate the spatial arrangement of these social and economic characteristics. What limits this attempt is the scarcity of disaggregate data, forcing the analysis to rely on every available data. This is a notion which reduces, to a large extent, the problems of how and what to choose to represent the societal characteristics.

The analysis is heavily relying on the available data from 1980, which was more comprehensive in its scope and was published at the level of urban quarters, to be supplemented by data from the 1986 census which was more limited. The data from the 1986 census is not published at the detailed level of the 1980 census, which makes the comparison between them less than comprehensive. Nevertheless, a combination of the two sets of data provides a more comprehensive and dynamic account of spatial structure and its change.

The available census data may be generally grouped into two categories: the data on the social and economic characteristics of the Tehranis, and the data on the land use in the city. The former includes density, household size, literacy, and employment, available indicators whose spatial analysis would reveal any geographical distribution of social variations. The latter covers a wider range of subjects including residential and working places, and public services such as health, education and so on. A spatial analysis of these data would show the relationship of social variations with the land use patterns and how the different uses of land are patterned, how these patterns relate to each other, and whether or not they are related to the social variations.

The services are in turn classified as modern and traditional, the former being those services which have been introduced through major social reforms in the twentieth century on the Western patterns. The aim of this classification is to observe how the new services, as they have emerged in the present century, have found spatial expression. Also it is meant to find out how their geographical distribution is related to the traditional services which have been used for centuries.

In addition to these data, the data on 1987 land prices (VOED,1987) and the Tehran municipality records of planning permissions during the period 1982-5 (ST,1985) are
used as indicators of urban development patterns and how these developments are valued.

These data are first individually analysed and their spatial arrangements illustrated. They are then used together, in a data classification process, to depict a general structure. The application of both uni-variate and multi-variate techniques are meant to give a more comprehensive representation of the urban structure.

2.1.1. The City of the 1980s

From 1980 to 1986, the population of Tehran, with a growth of more than 10 per cent, reached the level of 6 million. Excluding its suburbs, this is a city which extends over some 570 square kilometres to include all the previously separate settlements and suburban villages. It now extends from the foot of the mountains in the north to the edge of the desert in the south, embracing both Shemiran and Ray. Including its suburbs, this is a vast conglomeration which stretches beyond municipal boundaries, especially towards the west where there has been no natural limit to its development, to be nearly linked with the suburban city of Karadj 40 kilometres away (Figure 2.1).

Administratively, the city is divided into 20 areas, each with its own municipality, and 350 quarters or subareas (Figure 2.2), subdivisions also used by the census authorities. The 20 areas of the city are different in size and population. The largest, with 77.5 square kilometres, is the affluent area 1 at the foot of the northern mountains, which has one of the lowest densities in Tehran. The smallest area is 19, with 3.6 square kilometres, which is a poor area on the southernmost edge of the city with one of the highest densities. Area 13, an eastern area with 204,278 inhabitants, has been the least populated area in 1986, as against the southeastern area 15 which, with its 521,343 inhabitants, had the highest population for an area.

2.1.1.1. Density

In 1980, the average density in Tehran was 96.2 persons per hectare. The highest densities were mostly located in a grouping of areas from the south-western corner of the city stretched towards the east and north-east (Figure 2.3). As against this, the lowest density areas are to the north and north-west. The disparity in densities of the areas is also evident from 1984 figures (Razzaghi, 1988:95). In this year, 72 per cent of
Figure 2.1.
Tehran’s Urban Fabric
Figure 2.2. Areas and Quarters of Tehran
the Tehranis lived in 46.8 per cent of the city, whereas 53.2 per cent of the city was occupied by only 28 per cent of population.

In 1986, the average density increased to 106.17 persons per hectare, a 10 per cent increase with an uneven geographical pattern. This shows that the central, eastern, and southern areas have been higher than average, as compared to the less than average density of northern and western areas, as well as one southernmost area. The concentration of high densities was now in the south-west. However, the density of two northern development areas have been far less than the average, which suggests the development at lower densities for higher income groups.

The density of the area 17, which with 504.9 ppha was the highest in 1980, was reduced to 481.63 in 1986. The lowest density in 1980 was that of area 5 with only 12.9 ppha, which increased to reach as high as 263.95 in 1986. Now the highest density belonged to the area 19, southern neighbour of the area 17, which with an increase of 92 per cent had reached the density of 657.64 ppha. Also in 1986, the lowest density was that of area 1, northern neighbour of the area 5, being 26.98 ppha.

Overall, half of the areas have lost population in the six years of 1980-1986. These are mostly from central areas and their neighbours to the south, east, and north. Only three out of ten areas losing population have been north of the main east-west axis. In these years, these areas have lost 260 thousand, i.e., 8 per cent of their 3.2 million population. This loss becomes more significant when the potential natural increase of population is also considered.

As against the loss of population in the central and southern areas to reach its peak in area 12 with 22 per cent loss of population, there is a 29 per cent increase, 903 thousand inhabitants, in the population of the peripheral areas. The highest increase has been in the northeast, northwest, and southwest, where there are still found large undeveloped areas. These two simultaneous trends of deterioration in central areas and development in peripheral areas indicate decentralization and suburbanization. (Further statistical information about density and other variables may be found in Appendix 2.2).

2.1.1.2. Household Size

In 1980, the average household size for the city was 4.1. The southern half of the city, together with the rapidly developing areas of the north-west and north-east, are where
Figure 2.3.
Density 1980-1986 (Areas)

1980
Below Average  
Above Average  
More than %200  
Above Average

1986
Below Average  
Above Average  
More than %200  
Above Average

Changes 1980-1986
Decrease  
Increase  
More than %100  
Increase
Figure 2.4. 
Household Size 1980-1986 (Areas)

1980
Below Average
Above Average

1986
Below Average
Above Average

Changes 1980-1986
Decrease
Increase
the size of the households are above this average, as opposed to the central and northern areas (Figure 2.4). The largest size, 4.7, has been in the southern area 17 and the lowest, 3.6, in the north-central area 6.

In 1986, the average size of the households in Tehran increased to 4.4 persons. The largest size, 5.28, was that of southern area 19, as distinct from the smallest size of households, 3.87, which belonged to area 6 north of the centre. In general, the southern and western areas, together with the two peripheral northern development areas of 4 and 5, have had household sizes of more than average. The central and northern areas have been less than average.

Regarding the change in the size of households during the period of six years, only two areas, a north-central area 7 and the eastern area 14, have remained unchanged or decreased insignificantly. The size of the households in the rest of the 18 areas have been increasing even as high as 13.5 per cent in the southwestern area 18.

2.1.1.3. Literacy

In 1986, the average level of literacy throughout the city was 82.26 per cent of the population of 6 years of age and more. This figure in 1980 had been 76.8 per cent.

The pattern of distribution of the areas with more than average level of literacy refers to the areas north of the main east-west axis, the Enghelab avenue, together with some areas in the centre and east (Figure 2.5). The southern areas, in contrast, are all below the average. The concentration of the highest proportions of literacy is in the north-centre, along the axis which connects the city centre to Tajrish, leaving the peripheral areas with smaller proportions. In the southern city, the south-western areas have the highest negative difference with the average.

The highest percentage of literacy for an area, 91.48 per cent, is to be found in area 6, in the north-centre, as against the lowest proportion of 69.6 in the southernmost area 19. This difference of nearly 22 per cent is another indicator of the north-south division of Tehran.

2.1.1.4. Employment

The average rate of employment in the city in 1986 has been 23.95 per cent of the total population of 6 years and more. This figure, however, is not comparable to that of 1980
Figure 2.5. Literacy 1986, Employment 1986, and Land Prices 1987

Below Average
Above Average
whose basis for employment was the population of 10 years of age and more, for which the proportion of the employed was 33 per cent.

The central and northern areas in 1986 have had employment rates of more than average (Figure 2.5). Therefore, all of the southern areas and some of the northern ones have been below the average. The concentration of the higher rates is in the centre and east, the highest being 26.18 in the area 12, the old core of the city where the bazaar is located. The lowest level of employment, 20.96 per cent, is to be found in the area 18 which is a peripheral south-western area, which forms a zone with two other areas with similar patterns.

2.1.1.5. Land Use

2.1.1.5.1. Residential and Working Places

In 1980, 75 per cent of the total 1,279,476 units throughout the city have been categorized as residential, as compared to 22 per cent of the units being workplaces, both categories including empty and mixed use places. The census defines the workplaces as places wherein people are working, including retailing units, workshops, factories, and so on. Also the place or unit are defined as buildings or sites, or parts of them, which constitute an independent use. Apart from residential and working places, the rest of the places are identified by the census as under construction, kiosks, enclosed land parcels, and others.

Except for some comparatively small quarters in the centre and the south, residential use prevails throughout the city (Figure 2.6). In 337, out of 350, quarters of the city, more than 50 per cent of the places have been in residential use. The proportion has reached its maximum, more than 90 per cent, in the first generation of post-war suburban developments, which form a semi-circle around the pre-war urban fabric and is extended towards north, west and east. Towards the south, this concentration is dramatically reduced. Apart from the city centre, the proportion is at its lowest in the southeastern and northwestern areas.

The workplaces are mostly located in the southern half of the city, apart from some scattered quarters in the north (Figure 2.7). A major concentration of the workplaces is in the city centre, where the bazaar quarter, quarter 18 of area 12, itself contains 8 per cent of all the workplaces of the city.
Figure 2.6.
Dwellings 1980 (Quarters)
Percentage of Dwellings in All 2757.7 Spatial Units of a Quarter:

- 0 to %20 .................................................. 0
- %20 to %40 ........................................ %
- %40 to %60 ...........................................
- %60 to %80 ...........................................
- %80 to %100 .........................................
Figure 2.7.
Workplaces 1980-1986

1980 (Quarters)
Below Average
Above Average
More than %200
Above Average

1986 (Areas)
Below Average
Above Average
More than %200
Above Average

Changes 1980-1986 (Areas)
Decrease
Increase
More than %20
Increase
No quarter of the city has been without a workplace. The lowest proportion of workplaces to the total spatial units of a quarter has been 4 per cent in the quarter 11 of area 1, the northernmost area of the city. This should be seen in relation to the fact that the proportion of residential use to the total units does not reach 100 per cent in any quarter. This indicates that, apart from the central and southern areas in which mixed use is prevalent, the residential suburbs have also a level of workplaces. These are usually a number of small, local, services, located along the main streets and at their intersections which gradually tend to form local high streets.

There has been an increase of 1.73 per cent in the number of workplaces from 1980 to 1986, to reach the level of 287 thousand units. The geographical distribution of the change shows that 86 per cent of it has been in the two development areas of 5 and 4, in the northeastern and northwestern peripheries. At the next level stood three areas in the south and one in the north. Only a modest increase in the central north-south axis and in an eastern area is recognizable.

Eight areas have lost a proportion of their working places, of which five areas are to the south of the main east-west axis. The pattern of loss is consistent with the pattern of loss of density to a large extent. Seven areas have lost both population and workplaces. These are areas 7, 8, 10, 12, 14, 16, and 17. Five of them are located in the southern half of the city and all of them are inner and eastern areas.

In spite of these reductions, some of these areas have remained the places of concentration of workplaces. Especially area 12 which, despite a two per cent loss, still accounts for 22 per cent of all the workplaces. Together with three other central areas, 6, 7, and 11, they have 41 per cent of city’s workplaces. Apart from them, only one southeastern area, 15, accommodates workplaces in a number more than average.

2.1.1.5.2. Modern Institutions

These are the institutions, run by both public and private sectors, which have been introduced from the second half of the nineteenth century, in the processes of reform and modernization, to replace the traditional institutions. They are run by both public and private sectors and Those which are included in the 1980 census are educational and health care facilities, banks and government offices, public libraries, post offices and sport clubs, and car related services.
Figure 2.8. Modern Institutions 1980 (Quarters)

Below Average
Above Average
More than %200
Above Average
Health care facilities, as mentioned by the 1980 census, include hospitals, clinics, surgeries, dentists, pharmacies, injecting agencies, radiology laboratories, and other health institutions. The largest proportion of the health facilities, 75 per cent, is formed by surgeries and dentists. Overall, there are 6988 health units, constituting 10 per cent of all the named facilities.

The great majority of these facilities are privately run, which is seen in their selection of location, showing a concentration along the axis connecting the city centre to the northern suburb of Tajrish (Figure 2.8). In comparison to the average health facilities of a quarter, it is distinguishable that only along this axis the quarters are above the average as against the rest of the city which are below it.

The 3179 units of educational institutions, which include nurseries up to higher education, constitute 5 per cent of all facilities. Its largest proportion, 31 per cent, is that of primary schools. Compared to the health facilities location, these mostly publicly run institutions have a more even pattern of distribution (Figure 2.9). Despite this relative difference, again a northward concentration and a southward deprivation and a central axiality are recognizable. The central, northern, and eastern quarters are above the average, as well as some quarters in the south and south-east. The main centre-north axis is the place of concentration of the educational facilities.

The pattern of location of the 716 government offices throughout the city shows both the northward tendency and the central north-south axial concentration (Figure 2.8). Some quarters in the south and south-east have also had more than average offices. The location of the government offices, however, shows that even in these publicly run institutions, their location within the city has been tending to centrality.

Compared to the government offices, the location of the banks is even more centralized (Figure 2.9). Most of the 1635 units, branches of mostly private banks which had been nationalized at the time of census, were based in the centre and north of the city. Once again the north-south direction of the main axis, from the city centre to Tajrish, is distinguishable.

The total number of post offices, public libraries and sport clubs, of which the former two are publicly run, is only 383 for the entire city, which makes it difficult to be measured against the average. However, it appears that it is more evenly distributed
Figure 2.9.
Modern Institutions 1980
(Quarters)

Below Average       
Above Average       
More than %200      
Above Average
but yet the main axis and the northern half of the city are easily distinguishable (Figure 2.9).

Car services include car parks, petrol stations, and car repairs, with a total number of 9619 units, of which the latter type constitutes 86 per cent. These services are more located in the southern half of the city, especially concentrated in the south and southeast, along the main arteries which lead to the south and east of the country (Figure 2.9). Only one concentration is recognizable in the north-east and east along and near to the main thoroughfare which runs towards the east out of the city. These units are mostly private, apart from petrol stations which have links with the formerly National Oil Company.

2.1.1.5.3. Traditional Institutions

Of numerous traditional institutions which have survived, only three are mentioned in the census: religious institutions, coffee houses, public baths, and also food retailers.

In 1980, there have been 1555 religious units, including mosques, "takyeh" or "hosseinyeh", and other prayer places, constituting two per cent of all the named facilities. In their location, there is a general tendency towards the southern half of the city, with concentrations in the centre and the south (Figure 2.10). These concentrations are based more in the old core of the city which is stretched towards Hazrat-Abd-al-Azim in the city of Ray in the south.

Toward the north, many recently built areas have remained secular, a feature of the period in which they were developed. However, there are strong concentrations along the northern border, where there are a number of villages with numerous pre-existing religious places.

The location pattern of coffee houses and public baths is consistent with that of religious facilities (Figure 2.10). There is a general north-south divide with concentration in the centre, south, and south-east. There are also found in the northernmost quarters of the city along the foot of the mountains.

There are 1572 coffee houses, in which, despite their name, only tea is served, and 970 public baths throughout the city. The public bath is a centuries-old institution which had always been associated with the mosque and water reservoir, together with coffee house and local shops forming the nucleus of public services in the centre of
Figure 2.10.
Traditional Institutions 1980
(Quarters)

Below Average
Above Average
More than %200
Above Average
neighbourhoods. In recent times, due to the increase of private baths built within the dwellings, public baths have been associated with the poorer and older quarters, where they are needed more. The coffee houses were meeting points in these traditional local centres and only a few of them have kept their significance. In newer areas, coffee houses have been mainly used by the immigrant workers.

In 1980, there were 40983 food stores which constituted more than 60 per cent of the facilities. These have been usually small shops of different kinds, groceries, butcheries, bakeries, seller of dairy products, and fruit and vegetable shops. Only two per cent of the food stores have been in the form of department stores.

The pattern of distribution of the food shops seems to be more consistent with the distribution of population, which is more concentrated in the south (Figure 2.10). There are also some quarters in the north, north-east with more than average number of food stores.

2.1.1.6. Land Prices

In addition to the data from the 1980 and 1986 census, two other sets of information, regarding the patterns of land price and urban development will now be analysed. This would show any distinguishable relation between the spatial patterns of social variation and land use distribution, as already analysed, with the spatial patterns of new urban development and the way urban fabric is valued.

An average of the official prices of land in the city, as published in 1987 by the Ministry of Treasury and Economic Affairs to provide a legal basis for the deals and taxation, has been 16.79 thousand rials per square metres. The highest price, Rls 70,000 per square metre, is in Vali-Asr (formerly Vali-Ahd) square in the area 6. This is an area whose midrange land price is 128 per cent above the city average. This area and four neighbouring areas of 11, 12, and 3, whose midrange prices are more than 50 per cent above the average land price, form a north-south axis which stretches from the old city centre to the affluent suburbs of north. The next group, with up to 50 per cent above the average prices, are six areas which form a semi-circle around this north-south axis.

Therefore, the areas with midrange prices above the city average are all in the centre and north of the city forming a centralized pattern (Figure 2.5). Around them, from the south, east, and west, lies a group with midrange land prices below the average but with
a difference less than 50 per cent. To the south of them are located the southern areas of 15, 16, 18, and 19 with differences of more than 50 per cent below the average.

2.1.1.6.1. Land Prices and Street Pattern

The official land price is mostly determined by the position of the plots in relation to the street pattern, the type of activity in the area and the location in the city. Also the relationship to the major streets and avenues, the width of the access road to the site, and the orientation of the plot are of the essential determinants of the official land price.

The highest land prices highlight a number of streets and squares in the city centre and northwards (Figure 2.11). The highest price, Rls 70,000, has been in the Vali-Asr square (formerly Vali-Ahd) which is the meeting point of Vali-Asr (formerly Pahlavi) and Bulvar streets. This square is in area 6, north of the old city centre where the new city centre has developed.

The next important square, as reflected in its land price, Rls 55,000, is the Vanak square, north of the Vali-Asr square in the area 3. Both these squares are along the most important urban artery which connects the railway station in the south to the Tajrish village at the foot of the mountains. Apart from the price in the two mentioned squares, the land price along the Vali-Asr street is the highest in the city. Some other north-south streets have high land prices, yet none of them reach the level of importance of this street, so that the Vali-Asr street is undoubtedly the main north-south axis of the city. The land price along this street is between Rls 37,000 to 55,000 in its central and northern parts and falls down in its southernmost parts to Rls 25,000.

Similarly, the land price shows a main east-west urban axis, although less important than the north-south axis. This is Enghelab street (formerly Shahreza), with land prices of between Rls16,500 to Rls55,000, which passes through four important squares, leads to the airport, and is connected, from both sides, to major inter-urban arteries.

2.1.1.7. Urban Development

Between 1980 and 1985, on the basis of the various census data and Tehran municipality records, it is obvious that a rapid process of expansion of urban fabric is still at work. Considering the rapid increase in the city’s population and the vast undeveloped areas of the urban fringe, this has not been surprising.
Figure 2.11. Land Prices and Street Structure 1987 (Thousand Rials per Square Metre)

less than 30 ..........................  
30 to 40 ...............................  
40 to 50 ...............................  
more than 50 ..........................  

N 0 1 2 3 km
The results of the 1980 census show that most of the sites under construction have been along the northern and southern peripheries of the city. The records of planning permissions and their distribution between 1982 and 1985 reveals that, despite a general decline in the building activities after 1983, two peripheral areas of 5 and 15, as well as the area 2 which neighbours the former, have been substantially above the average. Addition of a new storey to existing buildings has in particular increased the density of the peripheral areas, especially the west and south. The statistics of illegal developments, i.e., without planning permission which have been identified by the municipality, are also supporting the development boom of the peripheral areas of the south and west, as well as the northeast.

2.1.2. Urban Structure

In order to illustrate the urban structure of Tehran, two methods for the analysis of data have been adopted. The uni-variate analysis, which has been already carried out, has provided insights into the urban structure from various different aspects. In what follows, a summary of this analysis is given. It will be then followed by the cluster analysis which uses all these data to classify them according to their relationship with each other.

2.1.2.1. Uni-variate Analysis

The results of the mapping of each variable, supported by direct observation, has shown that the city is bisected into a northern and a southern area with a clearly distinguishable axial city centre in the middle and smaller subcentres around, set within vast residential areas.

The bisection of the city is based on social differentiation. The smaller households of the affluent north live at lower densities, as against the populous households of the deprived south, living at higher densities. The bisection is also function-based. As against the older quarters of the south, there is a relative absence of traditional institutions and a concentration of new institutions in the new living quarters of the north.

Also the evidence shows that an axis of development is distinguishable in the city along the route which has connected the old core to the affluent suburbs of the north. Most of
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the services and facilities, not only those provided by the private sector but also those by the public sector, are concentrated in the city centre, the old city and its northward extension. As against this, most of the industries are located to the south. The rest of the city is, except for some pre-existing or longer-established areas, mostly residential, sometimes with the least possible levels of services.

2.1.2.2. Cluster Analysis

The use of the statistical technique of cluster analysis of the available 1980 data at the level of 350 city quarters (Appendix 2.3) makes it possible to define the urban spatial structure in Tehran of 1980 with a new insight. The results show that, at the most general levels, with the data grouped into three clusters, the urban structure is formed of central, intermediate, and peripheral clusters (Figure 2.12). The formation of these three clusters is correlated with the degree of the concentration of variables in each of them. Therefore, they are, respectively, zones of highest, intermediate, and lowest concentration of variables, those which, as already shown earlier, are indicators of social and economic characteristics of the people, and the patterns of use and value of the urban fabric.

The central cluster is a concentration of economic activities and amenities, and has the highest land prices in the city. This cluster is made up of 22 quarters and is axially shaped. It begins from the Bazaar in the south-centre and stretches northwards up to Darband at the foot of the Alborz mountains. This is where the cluster means for the proportion of residential places, the size of households, and, to a lesser extent, the car-related services are lower than the city mean. On the other hand, the number of workplaces, educational institutions, post offices, libraries, clubs, public baths, coffee houses, and especially health care facilities, banks, and government offices are greater than the mean for the city.

The intermediate cluster is comprised of 111 quarters which are the next level of concentration throughout the urban area after the city centre. They are either the extension of the city centre along the main outgoing routes, or the local concentrations of economic activities and population. This cluster is mostly located towards southwest, southeast, and northeast.

The 217 quarters of the peripheral cluster have the lowest densities and rates of activity. They are either very low density quarters located on the urban fringe or the residential areas around the intermediate centres. Using the cluster analysis of the same
Figure 2.12.
Urban Structure 1980
Cluster Analysis (Quarters)

Central Cluster
Intermediate Cluster
Peripheral Cluster
data but analysing the output of a larger number of clusters, the central axis and the peripheral cluster tend to remain consistent to a large extent, which enhances the concentric pattern of urban structure.

The mapping of the 1986 census data, although only available at the level of 20 areas and for fewer variables, supports the results of the analysis of 1980 data, showing north-south and centre-periphery relationships (Figure 2.13). Higher land prices, lower densities, smaller sizes of households, and higher rates of literacy and employment belong to the northern areas. As opposed to this, lower land prices, higher densities, larger households, and lower rates of literacy and employment are found in the south, where most of the workplaces are located (Figures 2.14, 2.15).

As regards the changes from 1980, the centre and the east are the areas which have lost population and economic activities, as against the growth on the peripheries and beyond the city boundaries to the west and south. Despite these losses, the central areas are still the main focus of the city. As shown by the pattern of land prices, this centre is axially formed along a north-south orientation and is intersected at right angles by a secondary axis.

On the basis of a cluster analysis of the 1986 available data, an urban structure can be worked out which shows a central axial area, from south-centre towards the foot of the northern mountains; an intermediate area which stretches from the centre to the east, west, and south; and a peripheral area which encloses the other two areas. The results of this analysis enhance the structure identified through analysing a different set of data from 1980. However, due to the difference in the unit of data, i.e., "area" in 1986 and "quarter" in 1980, there are inevitable overlaps in the definition of clusters.

The central axis includes the old city and its northward expansion, which now form the city centre of a metropolitan area. Here most of the urban activities are concentrated. Here the cluster means for land price and the number of workplaces are greater, and the size of households is smaller, than the city's mean.

At next level are areas recognized by a concentration of population, mostly located in the southern half of the city. These are residential quarters of low and middle income groups. At the next level are suburban areas with larger areas and subsequently larger populations although with lower levels of density and larger numbers of planning permissions. Towards the south, where only two out of six of these areas are located,
Figure 2.13.
Urban Structure 1986
Cluster Analysis (Quarters)

Central Cluster
Intermediate Cluster
 Peripheral Cluster
Figure 2.14.
A View Towards the Centre and Southeast

Figure 2.15.
A View Towards the North
these are the industrial estates as well as uninhabited land. To the north, these are the residential quarters of the higher income groups, where literacy and employment are higher.

This sketch of urban structure is supported by the Tehran Comprehensive Plan (Farmanfarmaian & Gruen, 1968). In 1968, the Tehran’s urban area, including Shemiran and Ray was 180 square kilometres with three million inhabitants. The Comprehensive Plan’s study regarded it as being divided into three distinct areas with different social, climatic, and morphological characteristics. The northern area was from Takht-e Tavous street up to Shemiran suburbs, located at 1,300 metres above the sea level with a density of 50 to 100 ppha. High income groups lived here in large houses which were accessed through tree lined streets and surrounded by numerous gardens.

Contrasting to this was the southern area, from the Bazaar to the old city of Ray, which was the living area of low income groups and the unemployed, many of them immigrants from the rural areas and provincial towns. The buildings were set in the land parcels of less than 100 sq.m., to constitute densities of 300 to 600 ppha.

The central area, from the north of Bazaar, Bouzarjomehri street to Takht-e Tavous street, with densities of 100 to 200 ppha, was occupied by the middle income strata. Two distinct types of physical fabric was distinguished within this area. The size of dwellings in the eastern and western parts were medium, while in the northern parts, the buildings were three to four storey high set in tree lined streets with better public facilities.

The acknowledgement by the Tehran Comprehensive Plan of different character of the northern parts of the central areas enhances the general north-south divide as distinguished in this study. It also shows how the north and south are separated through a spectrum rather than through a sharp break.

2.1.3. Suburban Settlements

One major characteristic of Tehran’s urban fabric is the presence of many small satellite settlements which have been gradually absorbed by the city in its outward expansion. These settlements have been either pre-existing rural areas or the new
settlements. The latter have themselves been a major form of urban development and have largely contributed to the expansion of the fabric.

There have been some 77 rural settlements which have been engulfed into Tehran (Kariman, 1976). In 1982, in addition to these, there were 92 new towns and settlements (Shahrak) identified around Tehran and Karaj (VMS, 1982). The list of 43 such settlements in Tehran excludes many well established townlets, such as Tehran Pars and Narmak, which had already incorporated into the fabric.

It also excludes the illegally developed, squatter settlements which have been increasingly growing. Although there are no mention of shanty towns in the 1980 census, the statistics of the main materials used in buildings is helpful. Of about 940 thousand dwellings in Tehran, 5389 dwellings have been reported to be tents or made by reed and the like. Shanty towns built by these tins and reed have sometimes been called with the names of these materials: "Halabiabad" (Developed by Tin) and "Hassirabad" (Developed by Reed).

Nevertheless, shanty towns have not been a major feature of the Tehran's urban structure. This is best reflected in their limited number and that the largest squatter settlement, which was destroyed by the authorities in 1988, had only 686 households (Kayhan Havai, 19th November 1988). Despite this, however, it should be noted that the south city, dense and crowded as it is, is the institutionalized form of shanty towns. Many of these "urban villages" (Piran, 1988) are incorporated into the main urban fabric through the gridiron of road networks.

The best example of these incorporated shanty towns are the "gowd" (ditch). These were created in the southern areas by development in the ditches left from the brickworks. These settlements, which in the early 1980s accommodated about eleven thousand households, were formed of 40 to 50 square metres houses built a few metres below the ground level with multi-family occupancy (Jame’e va Me’mari, June 1981; Faghih, 1964:340).

There are also a number of large suburban settlements beyond the municipality boundaries, previous villages now grown into towns and cities by the influx of poor immigrants. These southern suburbs, which have not been accounted for in the census as a part of Tehran, have had considerably higher densities than Tehran. In 1976, these settlements had some of the highest numbers of persons per room in the country, up to
average 2.94 in Ghassemabad as compared to average 1.65 in Tehran. These suburbs accounted for smaller numbers of rooms per dwelling, 2.69 in Hassanabad as compared to 4.01 in Tehran, and also larger numbers of households per dwelling, 1.69 in Hassanabad as compared to 1.47 in Tehran (MAI, 1984).

2.2. Morphology of Urban Quarters

This section seeks to scale down the inquiry on urban form to more detailed levels of urban quarters. In order to study Tehran's urban form, as identified by street system, building form, and land use pattern, it has been essential to select samples of urban fabric which represent different types of form. Since the approach to the production of the built space has changed during a process of outward expansion of the city, these studied samples were chosen accordingly to typify the historical stages of urban development. Their selection has also been made so as to represent the clusters identified by the process of cluster analysis.

The urban quarters, as physical and social entities which characterized the city of Tehran in the nineteenth century, no longer exist. The chosen samples of this study (Figure 2.16) are merely tracts from the 1980 census of Tehran. They are quarters of between 37 to 158 hectares accommodating populations of 3.2 to 21.9 thousands (Appendix 2.4). The quarters are here named as they are known or on the basis of their important landmarks.

The sample quarters are located in the city centre, in the intermediate and in the peripheral areas, as identified by the cluster analysis of data from 1980 and 1986. Oudlajan, Baharestan, and Daneshgah are within the central development axis of the city, i.e., the old city and its northward expansion. Yousefabad and Mortazavi are in the intermediate areas which are immediately beyond the central axis. Shahrara and Shahrak-Qods are in the peripheral areas which enclose the other two.

The sample quarters from the central areas of the city are superblocks enclosed by major intra-urban arteries. Towards the periphery, the samples are formed of groups of blocks which are defined more by local roads. It is obvious that in a city with the scale of Tehran, these samples are merely indicators of a variety of forms.

The date of the development of the quarters exemplifies the various periods of outward expansion of the city. Oudlajan quarter was developed before 1850, Baharestan in the
Figure 2.16.
Sample Quarters

1. Oudlajan
2. Baharestan
3. Daneshgah
4. Mortazavi
5. Shahrara
6. Yousefabad
7. Shahrak-Qods

Note: Samples 5 and 7 are only a part of the census tracts.
second half of the 19th century and early 20th century, Daneshgah and Mortazavi in the 1930s and 1940s, Shahrara and Yousefabad in the 1950s and 1960s, and Shahrak-Qods in the 1970s.

The samples, especially the 19th century quarters which now constitute parts of the city centre, have undergone changes of use and physical structure. These changes have occurred in the other sample quarters mostly at the level of individual buildings.

Three main characteristics of form will be studied in the selected quarters: streets system, building form, and land use pattern. The discussion about other subjects, such as squares and blocks as well as orientation and land division, are discussed in association with these main characteristics.

### 2.2.1. Street System

The discussion of the street system here includes the patterns that streets, squares, and blocks have taken. The two subjects of land division and orientation, which follow these, are shared by the street system and building form. Nevertheless, for the sake of consistency, their discussion has been included in the street system.

#### 2.2.1.1. Streets

The historical sequence of samples shows a fundamental change in street pattern: from a system of twisting streets and narrow cul-de-sacs to a gridiron pattern of wide, straight streets (Figures 2.17, 2.18).

The traditional street pattern is here exemplified by Oudlajan (Figures 2.19, 2.20), a quarter with an urban fabric which was later cut and enclosed by new thoroughfares. Its street system is hierarchically structured by twisting alleys, the widest of which being only 6 metres, leading to narrow cul-de-sacs ending in groups of buildings. This is a tree-like distribution system based on the scale of pedestrian movement. The spine of this system is roofed at some intersections and would serve as a local centre, a "bazaarcheh", lined with few shops, baths, and mosques.

The main characteristic of the form of these streets is not the absence of straight lines. Many apparently winding streets are formed of connected straight alleys each of which, such as Rokni and Arabha streets, can be up to more than 250 metres long.
Figure 2.17.
A Narrow, Twisting Street in the Old Quarters

Figure 2.18.
A Wide Straight Street in the New Quarters
What is absent, however, is the notion of an overall geometrical pattern according to which the street is connecting two points through the shortest possible distance.

A transitional stage introduced a radical departure from this system. The street pattern of this stage, from the second half of the nineteenth century until the world war II and early post-war period, is shown by Baharestan, Mortazavi, and Daneshgah (Figures 2.19, 2.20, 2.22). It is an orthogonal system with straight, wide streets, which intersect at right angles to determine the structure of the quarters, together with narrow cul-de-sacs.

In the earlier stages, as in Baharestan, these wide streets do not yet constitute a network. They were constructed as prestigious urban elements whose facades were important contributions to townscape. The perspective of straight streets with more elaborated facades contrast the view to the curving alleys of Oudlajan with their blank walls. In Daneshgah, however, in which the scale of the streets is related to the movement of vehicles, networks of streets were laid out with traffic roundabouts as the focal points of the physical structure.

There are no overhangs and roofs over the streets. However, cul-de-sacs and narrow streets are still in use, in line with the low levels of car ownership. Compared to the old cul-de-sacs, which were sometimes ramified several times to reach all points of the fabric, these are shorter and less important.

In Baharestan, the length of the streets and alleys is nearly the same as in Oudlajan. What is different, however, is the declining proportion of the dead-ends. From 39 per cent of all the inner streets of Oudlajan, the proportional length of cul-de-sacs falls to 31 per cent in Mortazavi, and to 26 and 20 per cent in Baharestan and Daneshgah. This is the beginning of a process in which cul-de-sacs gradually disappear. It falls to only 3 and 2 per cent in Shahrara and Yousefabad and to disappearance in later developments (Figures 2.21, 2.22).

The transitional stage was followed by a pattern of gridiron networks, as represented by the post-war developments in Shahrara and Yousefabad. From the 1930s, the new streets had crossed the fabric to create a citywide network of roads which isolated the old fabric within superblocks to be transformed in the long term. In the development of new quarters, however, the gridiron was adopted from the beginning as a framework for physical development, which soon became the overriding norm.
Figure 2.20. Street System
Within the gridiron network, a standardization of the widths of streets and the size of the plots was made possible. This geometricality set the pattern for the future developments and formed the basis of the arrangement of urban form ever since.

After the establishment of the grid, a new street pattern, as applied in Shahrak-Qods, was introduced in which cul-de-sacs were used. As suggested by the structure plan of this new town (Municipality of Tehran, 1973; ArchiSystem, 1976), it is based on the assumption of a high level of car ownership and is comprised of a hierarchy of vehicular roads and a closed system of pedestrian footpaths, the two to be segregated as much as possible. In the studied area, 44 per cent of the streets are open-ended primary and secondary roads, 43 per cent cul-de-sacs called as development roads, and 13 per cent footpaths connecting the cul-de-sacs to the open network.

The reappearance of cul-de-sacs is a major feature of the street pattern. As in Oudlajan, they are working as a distribution system which controls the accessibility and mobility. However, there is a major difference between them, that of the scales of pedestrian and car.

In spite of the partial similarities between the urban form in various stages of the urban development, there is no evidence to show any direct inter-connection between the old and new forms. Nevertheless, some elements of continuity, as manifested for example in the appearance of the high street as the spine of the new quarters, might be traced.

2.2.1.2. Squares

In the new sample quarters, as in the rest of the city, the squares are often traffic circles which also function as landmarks in the urban space. Some of these are marked by landscaping and sculptures, mostly of the last two shahs before the revolution replaced more abstract sculptures consistent with Islamic requirements. None of these squares, dominated by cars, provides a place for pedestrian communication in a rather large scale. It is different from the small openings in the fabric of the old quarters such as Oudlajan, which worked as meeting points and sometimes were elaborated as places for ceremonial and religious performances called "Takyeh".
Figure 2.21. Street System
2.2.1.3. Blocks

In Oudlajan, a number of blocks can be distinguished which are formed by alleys surrounding a group of buildings in a rather free manner (Figure 2.23). It seems that the form and orientation of the streets have been determined in relation to the position of each individual building. The resultant blocks are, therefore, far from following established geometrical patterns of later developments.

One of the characteristics of the new street system was its identifiable blocks which resulted from the urban fabric as defined by being enclosed within intersecting streets. The form of these blocks tend to standardization and uniformity with the passage of time (Figure 2.24). The size of blocks, however, follows the size of land plots, which is determined by the process of production and the economic status of the quarter. Where the street system has been totally different, such as in Shahrak-Qods, only superblocks are recognizable.

2.2.1.4. Orientation

In all the studied samples, as in other areas of Tehran, there is a general east-west and north-south pattern of the streets with minor alterations. Even in Oudlajan, with its lack of a clearly defined geometrical pattern, this prevailing orientation is visible.

There are, however, certain peculiarities in each quarter. Since Baharestan has been a northward expansion of the city, its structure has been oriented along the north-south axis. In Daneshgah, the orientation of the internal rectilinear network is clearly following the patterns of the outer boundaries, which are some of the most important thoroughfares of the city. This layout shows the primacy of the main structural elements in the formation of the street pattern and the consequent adaptive creation of the internal structure of the superblock.

Existence of the canal routes in Mortazavi has diversified the type and orientation of the developments in three areas. Nevertheless, the location of the quarter in the southwest city, and its feature of being enclosed and cut by east-west arteries, establishes the orientation of the street pattern in line with the rest of the city.

In Yousefabad and Shahrara, the high streets are along the north-south axis and the smaller streets are at right angles with them. Like in Shahrak-Qods, one of the main
concerns in the street pattern has been to lay out the land plots so that they could face the south.

2.2.1.5. Land Division

The plots of land in the old quarter of Oudlajan are varied in shape, size, and orientation. A combination of numerous diverse plots has created a pattern of land ownership which has evolved gradually over the years.

In Baharestan, the plots are still of different size and shape. The only distinction here is the presence of the rectilinear street framework in which the plots are defined.

In later developments, like Daneshgah, a new land division system has been introduced whose rudimentary signs might be seen in Baharestan. It is based on a move towards the standardization of the size and the shape of land plots and the importance of their relationship with the street. Rectangular plots, with large dimensions, are so located that their narrower side flanks the streets as a frontage. In this way more plots can be served by a single street and their arrangement is thus entirely based on their access to and view from the street (Figure 2.22).

In Mortazavi, the southern part has moved to a standardized pattern of land division, yet the use of dead-end streets indicate a diversity of plot size and access type. The high density of the quarter has led to minimization of the plots in order to accommodate as many as possible families who wish to have separate houses. The figure of 83.17 dwellings per hectare, which is more than three times that of the Oudlajan quarter, indicates this tendency.

The size of the plots in Shahrara, in line with the size of the blocks has been reduced. The gridiron structure has allowed the development to have a higher possibility of utilization of land in search of profit. With the financial capacity of the target group of inhabitants, the size of the plots needed to be smaller to be affordable.

The arrangement of the streets and blocks in Yousefabad allow the land division system to be standardized. Plots are mostly rectangular being 8 to 12 metres wide and 20 to 30 metres long.

In Shahrak-Qods, the land division system for the detached houses is essentially the same as the other quarters, except Oudlajan: rectangular plots with the narrower side as
the frontage. However, in the case of middle and high density housing areas, the division system has changed and the plots are large enough to accommodate these developments. Some of the middle density developments have integrated several individual plots to form a larger plot.

2.2.2. Building Form

A change of building form, from introverted, one or two storey, courtyard housing to extroverted, higher buildings with different internal and external arrangements, is traceable in the comparison of the quarters (Figure 2.25).

The Oudlajan quarter, still to a large extent residential, is formed of one or two storey courtyard houses, the main traditional pattern of housing in Iran, in which the rooms are built on one or more sides of a courtyard. All the windows open to this courtyard which often has a water pool and some vegetation in the middle, leaving the alleys and streets with blank facades. The only elaboration in the external facades is to be found in the portal of the houses. However, in the public areas such as bazaars, the facade, which at times is highly elaborated, is formed of a series of shops lined along the covered street. The roofs are flat or domed and the colour of the buildings is the colour of the earth, the adobe and brick with a covering layer of mud-straw being the mostly used material.

In Baharestan, mainly developed in the second half of the nineteenth century, in line with the basic change of approach towards the street pattern, a shift occurred in the building form. The introverted courtyard houses started to be replaced with detached houses enclosed within walls. The windows were looking outside, as opposed to the previous patterns. In this quarter, a new style of roofs, the pitched roof as opposed to the flat roof, was introduced, which remained in use until the early post-war period, when it faded away in favour of flat roofs.

However, the building form to be established as the main pattern throughout the city was a terrace formed of flat-roofed buildings (Figures 2.22, 2.26). In this pattern, individual plots are walled and developed often separately in different times. Within each land plot, a new arrangement was set up: outward looking buildings mostly positioned to the north of the plot, leaving the southern part to be used as a garden. The south-facing windows open to this garden which, being surrounded with walls, is the new version of the courtyard (Figure 2.27). Where the land plot allows, the north-
Figure 2.25.
Changing Building Form

Figure 2.26.
The Main Pattern of Building Form in the New Quarters

Figure 2.27.
The Walls Enclosing the Buildings
new version of the courtyard (Figure 2.27). Where the land plot allows, the north-facing windows open to the street. This arrangement tends to be similar everywhere in the city disregarding the location of the plot, even along the north-south streets.

Therefore, the access from the street is through the court if the plot is on the north of the street, and through the building if it is a southern plot, an arrangement widely used in successive generations of development. With this arrangement, all the streets of the Yousefabad quarter, like many other quarters, have the same perspective: on the northern edge there are the walls of the courtyards and on the southern edge the buildings of the houses.

In Daneshgah, another pattern of building form was applied mainly along the main streets. Higher buildings flanked the streets from both sides with no serious intention to make a north-south justification of the development.

As in the land division system, the building form in Mortazavi exhibits a move towards the standardization which was to be completed later. Two storey houses with a walled courtyard on one side, usually to the south, are becoming more or less a norm.

In the development of Shahrara, rows of multi-storey flats with communal unwalled gardens were introduced. Whereas the use of flats became rapidly widespread, the unusual pattern of combined gardens was not utilized in later developments. The now conventional pattern of terraces of two storey houses was also forming the other category of dwellings.

The development of Yousefabad initially started with building two storey houses. Gradually, there was a tendency to divide the two storeys as two separate dwellings, one to be let or used by another household. The two separate dwellings tending to change into three and four storey flats. The result is a mixture of two storey houses and flats with a percentage of higher buildings of up to six storeys.

Piloties are widely used in the buildings to leave the ground floor as the parking area, a notion which gradually has changed the face of the city as a whole, devoting the street levels more and more to the cars and detaching the houses from the pedestrians.

Three styles of housing have been designed to be built in ShahraQods: the low density (80 persons per hectare) detached houses of one and two storeys, medium density (200
ppha) flats of 4 to 7 storeys; and high density (300 ppha) high rise flats of 15 to 20 storeys. The latter were planned to be concentrated on the heavily-contoured areas around the town to find a better visual impact. In the studied quarter, two sites are devoted to the high rise development towards the south and the rest either unbuilt or specified as the low density housing.

In Tehran, there has been an increase in the number of three storey dwellings as against the decline in one and two storey structures. This has been constant with the change in the form of occupancy. In 1984, 21.6 per cent of households in urban areas of Tehran province were living in rented accommodation and another 13.5 per cent in different forms of occupation other than ownership. About half of the buildings completed in 1985 were composed of more than one dwelling (BMI, 1987). There has been an increase in living in flats to reach 23.3 per cent in 1984, the highest in the country. These flats are mostly occupied by the middle income groups with about two thirds of their dwellings between 50 to 150 square metres large (MAI, 1985; 1986b).

In spite of a general increase in the height of buildings, the highest buildings in the city are luxury residential flats in the north and not in the city centre where the land price is at its peak. The old city centre, the bazaar and its periphery, have resisted to large scale physical change. It has been the northern expansion of the centre, mainly in Takht-e Jamshid street, which has increasingly accounted for some high rise office buildings and hotels.

2.2.3. Land Use

In all of the quarters, the main pattern of use is a mixed one. However, in the central quarters, non-residential uses prevail while in the intermediate and periphery the prevalent use is residential. It is exemplified by the fact that in Oudlajan, 72 per cent of all the places are workplaces, 41 per cent in Baharestan, 32 per cent in Daneshgah, and with moving outwards from the centre, down to 3 per cent in Shahrak-Qods. As against this is an increase in the proportion of dwellings towards the periphery.

The structure of the quarters, as constituted by land use, is mostly conditioned by their distance from the city centre and the age of development. Whereas the older, centrally located quarters have undergone dramatic changes, the newer ones located in the intermediate and peripheral zones have remained comparatively unchanged since their original development.
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The quarters of the old city and its northward expansion, as represented by Oudlajan, Baharestan, and Daneshgah, now fall in the central development axis of the city. These are so structured that most of the non-residential activities are concentrated along the edges of these superblocks, while their middle points have remained mostly residential (Figures 2.28, 2.29).

The non-residential activities, mostly commercial, which are lined along the thoroughfares and their intersections, have penetrated into the superblocks as far as the location of the quarters in the city and the level of accessibility provided by their street patterns permit. The location of these activities is also conditioned by the orientation of the superblocks towards the city centre and the major thoroughfares and squares. Thus the quarters find a face, a back, and a heart, wherein economic activities prevail in the former and residential use in the latter.

For example, in Oudlajan, the highest proportion of the workplaces, around 90 per cent of the spatial units of a block, are located along the southern edge where the central Bazaar is a neighbour. This proportion falls to about 77 per cent along the western edge and to about 60 per cent along the northern edge. However, the central part and the eastern edge are remained highly residential. Residential places constitute about 81 per cent along the eastern edge and even higher proportions in the core.

In the oldest of the sample quarters, Oudlajan, the original structure of land use was so that the local, non-residential activities formed a local high street, a bazaar usually partly roofed, to serve its surrounding residential area. The new structure, which is in some aspects the reversed version of the old structure, show the importance of the intra-urban arteries cutting through the urban fabric. These imposed structures provided the street frontages as desirable places for the activities which required vehicular access. It was also desirable for the new commercial uses such as banks which needed to be widely present and be associated with the wide and straight avenues, both as signs of modern life. In this sense, these imposed structures provided a corner stone to the change of use and structure.

Another dimension of change in the central quarters, especially in Oudlajan and Baharestan, is the out-migration of the original inhabitants to the suburbs and abroad, which started as early as the second half of the nineteenth century (Ettehadieh, 1983). The streets and alleys of these quarters have often taken the names of these aristocratic
Figure 2.28.
Dwellings 1980 (Blocks)
Percentage of Dwellings in All Spatial Units of a Block

- 0 to %20
- %20 to %40
- %40 to %60
- %60 to %80
- %80 to %100

Baharestan

Oudlajan

Mortazavi

Daneshgah
Figure 2.29.
Workplaces 1980 (Blocks)
Percentage of Workplaces in All Spatial Units of a Block

- 0 to %20
- %20 to %40
- %40 to %60
- %60 to %80
- %80 to %100
inhabitants, e.g., Zahir-al-Islam and Shokuh-al-Mamalek. They have been replaced by the incomers from provincial towns and rural areas as well as immigrants from Afghanistan, India, and Iraq (Rahmani & Hafeznia, 1988).

As distinct from the central quarters in which the non-residential uses, usually functioning at a citywide level, are lined along the main arteries, the suburban quarters are structured very much similar to the old quarters. These are residential areas in which local high streets, equivalent of local bazaars, have been or are being developed. Mortazavi, Shahrara, Yousefabad, and Shahrak-Qods are the examples of this type of structure (Figure 2.30, 2.31).

Therefore, it might be concluded that, in the sequence of various forms of land use structure, a cyclical pattern has emerged, which is in line with the historical expansion of the urban fabric. The similarity of land use structure between the new suburban quarters and the old neighbourhoods reveals a continuity which has been reproduced during the different stages of urban development and suburbanization.

The impact of the age and location of the quarters might also be traced in numerous aspects of the samples. Apart from a centre-periphery relationship, a north-south difference is also recognizable. Population density, number of household per dwelling, and density of activities often decrease with moving from the central development axis towards the peripheral quarters. The fact that the Mortazavi quarter is an exception shows also a social and economic difference along the north-south direction.

The centrally located quarters have specialized areas as the concentration of certain activities serving the whole of the city and sometimes the whole country, which features the quarters and adds to the dimensions of their form. For example, the concentrations of wholesalers and retailers of medical goods and car spare parts in Oudlajan, of booksellers, shoemakers, weavers and tailors in Baharestan, and of educational and medical facilities in Daneshgah.

In the suburban developments, however, there are no specialized areas mainly due to their location. Here sometimes the basic public facilities are lacking due to the later date of development or the location in the periphery, especially towards the south. For example, in Mortazavi, the number of educational facilities is almost half the average quarter and the health facilities less than a third. Being a highly populated quarter, however, it accommodates more than average groceries, butcheries, and bakeries. On
Figure 2.30.
Dwellings 1980 (Blocks)
Percentage of Dwellings in All Spatial Units of a Block

0 to %20
%20 to %40
%40 to %60
%60 to %80
%80 to %100
Figure 2.31.

Workplaces 1980 (Blocks)
Percentage of Workplaces in All Spatial Units of a Block

- 0 to %20
- %20 to %40
- %40 to %60
- %60 to %80
- %80 to %100

Yousefabad

Shahrara

Shahrak-Qods
the other hand, the northern, rich quarter of Shahrak-Qods is still deprived of the basic facilities due to a halt in its development.

2.2.4. Land Price

The pattern of 1987 land price in the quarters, in spite of a seven year gap with the 1980 data, reflects the street structure and the land use system as analysed earlier. It shows the supremacy of the intra-urban arteries in determining the urban structure and the importance of direction towards city centre and major urban axes.

At the intersections of these arteries, land prices reach their peaks. For example, the northeastern corner of the Daneshgah superblock, the Vali-Asr square, has the highest land price in the city and thus forming an important focal point. It is located on the intersection of north-south street of Vali-Asr with the east-west Boulvar-Keshavarz. It is a centre of business attraction forming the focus of the northward expansion of the city centre.

Both in the peripheral developments, in which accessibility is higher, and the central areas, the land price is scaled down with a decrease in the street width. In the central quarters, there is an inward downfall of the price from the edges of a superblock towards its heart. The land price is higher along the main streets and is maximized where commercial uses are dominant. It is lower in the middle of superblocks where residential use prevails and accessibility is usually lower. This is especially the case in Oudlajan whose street pattern, narrow twisting alleys and cul-de-sacs, minimize the access to the core of the quarter. In later developments, a cul-de-sac has the same lowering effect on the land price.

2.3. Conclusion

Excluding its suburbs, contemporary Tehran is a city of about six million inhabitants which extends over some 570 square kilometres. In its structure, a north-south and a core-periphery division, an axiality, and the presence of many satellite settlements are recognizable.

The north has higher and larger buildings, higher land prices, lower densities, small households, and higher rates of literacy and employment. It is mostly residential but
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accommodates higher concentrations of modern facilities and amenities, both public and private. As opposed to this is the south with its smaller buildings, lower land prices, higher densities, larger households, lower rates of literacy and employment, and concentration of traditional institutions.

Apart from this relationship, a core-periphery division is also traceable. The city centre accommodates most of the activities and is enclosed by an intermediate zone which is the place for concentration of population and lower rates of activity. At next level lies the peripheral zone with the lowest densities and rates of activity. The impact of the continuing process of suburbanization on this model has been the loss of population and economic activities in the centre and the advent of a development boom on the periphery. Also the development of peripheral sub-centres and high streets are distinguishable.

A major feature of urban structure, and a constituent part of the core-periphery relationship, is the spread of satellite settlements around the urban fabric incorporating into it gradually.

Another dimension of the urban structure is its axially. The city centre, being comprised of the old city and its northward expansion, is formed as an axis linking the south-centre to the northernmost areas. Along this axis is where most of the facilities and amenities are located and land prices are at their peak. A secondary axis, intersecting with the main north-south axis at right angles is also recognizable. The main squares along these two axes have proved to have the highest land prices in the city and be focal points of urban structure.

The history of street pattern, land use pattern and building form, which the sample quarters represent, is one of radical change. It starts from a traditional form being transformed into a transitional and a modern pattern, before new trends emerge.

The process of change in the street pattern is characterized by the gradual dominance of an orthogonal geometry and demand for creating transportation networks to ease mobility and accessibility.

The traditional street system is a hierarchical distribution system, based on the scale of pedestrian movement, whose spine works as a local centre, a bazaar. It is comprised of
narrow, twisting, partly roofed streets leading to cul-de-sacs which end in groups of buildings.

In the transitional phase, from the second half of the nineteenth century until the world war II, this system was radically changed into an orthogonal system of wide, straight intersecting streets, in which cul-de-sacs gradually reduced and disappeared, and a network of vehicular transportation established. The next stage is one of universalization of gridiron network as an open framework for physical development. In the final stage, the use of cul-de-sacs in a hierarchical, distributional system is reintroduced.

This street system which, old and new, is generally orientated towards the south, introduces a block system which has been changing towards rectilinearity and standardization. These are two properties to which also the shape of land plots has moved in order to fit into a grid system.

The building form also changed accordingly from the introverted courtyard housing to extroverted buildings such as detached houses, terraces, and medium and high rise apartments to be adjusted to the new access system. However, what remained unchanged was the need to enclose the gardens to create a private courtyard.

In the extent of change of land use patterns, two factors of age of development and its location are identifiable. Whereas the mixed land use pattern is predominant in all the quarters, the proportion of residential use is higher in the peripheral quarters as compared to the predominance of workplaces in the centre.

The centrally located, older quarters which are enclosed in the main thoroughfares are so structured that the non-residential use prevails along the edges, especially those facing the city centre. These uses have penetrated the superblock but so far as the street system and location in the city permitted. However, the heart of the quarter has remained residential. This reveals the impact of the new street system and its frontages as rivals to the old bazaars.

The structure of the newer peripheral quarters is contrasting this and showing similarity to the pattern of the old quarters before being cut by the new streets: a high street in the middle of the quarter developed to serve the surrounding residential area.
The information on the quarters enhances the findings of the analysis of urban structure in confirming the existence of suburbanization, a north-south and a core-periphery relationship, and shows phases of dramatic change in urban form. However, the re-emergence of high streets, the widespread use of hierarchical distributive street system, and the survival of courtyards suggest an element of continuity.

It is these characteristics of Tehran’s urban form which determine the platform of the research. From now on, during the course of the chapters Three to Seven, the main task of the study will be to explore why these characteristics are as they are. However, as mentioned earlier, a crucial point should be noted here: although the study of urban form in this chapter has been based on two levels of urban structure and urban quarters, the rest of the study will be focusing on the characteristics of urban form at a combined level, as outlined in this conclusion. The attempts to explain these characteristics, therefore, will not necessarily dwell upon any of the variables or the samples used in this chapter.
Chapter Three

PHYSICAL ENVIRONMENTAL CONTEXT
In this chapter, the physical environmental context, in which urban fabric is produced, is studied. This will provide one of the two main contexts, referred to in the development of methodology in the Chapter One, whose study is essential in understanding the urban development process and the form of urban fabric.

The chapter looks at the natural and built environmental contexts and their impacts on urban form. Whereas the natural environmental context focuses on such factors as topography and climate, the built environmental context discusses the evolution of the physical fabric and the way it has provided the setting for the development of contemporary urban form. Although built environment is the meeting point of the physical and social environmental contexts, it has been discussed here mainly to show the evolution of physical forms and their relationships with the studied urban form.

### 3.1. Natural Environmental Context

In the study of the natural environmental context, those characteristics of this environment should be considered which are of prime importance for the development of any built form. Physical environmental factors such as topography and climate directly influence the concrete situation of each urban area. Whether or not taken into consideration in the development of urban fabric, their impact is visible at various scales of urban form. An urban fabric in an undulating or a flat area, with or without rivers and canals, whether or not abutting mountains or deserts will have different forms. Also climatic variations, as being dry or humid, hot or cold, act in their own way to influence the form.

#### 3.1.1. Topography

Iran has been generally likened to a bowl, with a highland interior, much of it with an altitude of more the 1,000 metres above sea level, surrounded by an outer rim (Fisher, 1968). This rim is formed of high and bold mountain chains, extensive also in ground area, in the north and west, and of narrower and lower ones in the east and south. Due to the aridity of the central highlands, with two large deserts at the middle, most of the towns and villages are situated along the northern mountain range of Alburz and the western chain of Zagros. Here factors such as availability of water,
arable land, safety, and a more moderate climate have made the foot of the mountains favourable for settlement.

The Alburz chain, which runs from northwest to northeast with an average width of about 100 kilometres, is unusually high, appearing as an almost continuous wall from both sides (Fisher, 1968). Approximately in its centre, there lies Mount Damavand, 5678 metres high, which is Iran's greatest peak and is higher than any other summit to the west of it in Asia or in Europe. Due to its restricted width, the chain is extremely steep, especially in the northern slopes which rise directly from the coastal plain of Caspian, which lies at or just below sea level. This relative difference is reduced in the southern side due to the great altitude of the inner plateau, where the land surface drops more gradually by shallow terraces and low bluffs to the flat wastes of "Kavir".

The city of Tehran is located on these southern slopes of the Alburz chain (Figure 3.1), not far from the Damavand ridge so that it can be seen from the city in the bright days. Immediately 20 kilometres to the north lies the To-Chal ridge, 3933 metres high, which dominates the city (Lockhart, 1960). To the south, Tehran stretches to the Kavir, the central desert of Iran. The centre of the city is on the longitude of 51 degrees 26 minutes east and the latitude of 35 degrees 41 minutes north (Kariman, 1976:8).

The northernmost limit of the city, as established by the municipality, is the contour of 1,800 metres above sea level. When compared to the height of 1,160 metres in its southeastern border, it shows a difference of more than 640 metres between the two furthest points of the city. It even increases in the southernmost parts of the city which is about 30 kilometres from the northern limits. This dramatic difference in height has had important implications in determining the characteristics of built form in Tehran.

3.1.1.1. Topography and Urban Fabric

The topography of Tehran has been crucial in setting restrictions and potentials for the expansion of urban milieu: to the north and, to a lesser extent, to the east, the growth of the city has been limited by the wall of mountains. To the south, the desert has provided such barrier to expansion, although less definitive than the mountains. However, towards the west, there has been no natural barrier and the built environment has gradually stretched towards the city of Karaj, 40 kilometres away, which has become the most rapidly growing suburb of the capital.
Figure 3.1.
Tehran’s Urban Fabric on the Southern Slopes of Alburz

3000m above sea level

2200m

1200m

10km  N

10km
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The north-south slope, on which the city is built, has provided a natural setting in which the process of social stratification, and hence the urban structure, has taken a particular shape. The north was traditionally associated with privileges such as a better supply of water, a higher defensive value, a visual dominance over the south and the countryside, and a better climate. Given the scale of the old city, it appears that at least the former three have been instrumental in the location of citadel in the northern side of the city.

These privileges were enjoyed by Tehran itself as a northern suburb of the ancient city of Ray. From the early nineteenth century, some of the villages to the north of Tehran, now incorporated into the urban fabric, became the summer retreats of the royal and aristocratic families and, later, foreign embassies. This set a pattern which became a normal procedure: those who could afford to choose their living places gradually moved out to the north and the south remained for those with lower levels of freedom of choice.

The presence of a wall of mountains on the northern end of the city and the downward slope make possible a sense of orientation which in many areas of the city can be felt. Since the street system had been adjusted to the slope and the mountain, nearly all the north-south streets can be distinguished with being on the slope and having a scene of the snow-covered mountains of the north. This sense of orientation is increased in these north-south streets due to the orientation of the slope: ascending when moving to the north and descending when moving to the south.

The difference in the height of the northern and southern areas has made possible a visual contact between these two areas. In many northern areas, the central and southern city is visible, while some of the latter parts can have a sight of the former. Whereas earlier this could mean a visual superiority of the north, it is now much less so due to the smog which limits any panoramic view over the city.

The existence of hilltops and valleys in the north and flat land in the south has given rise to emergence of a dual typology of skyline. Whereas the north, due to its varied topography as well as to the relative wealth of its inhabitants, has a diversity in its skyline, the southern skyline is less diverse and more monotonous. Exception to this is the old fabrics in Tehran and Shahr-e Ray, where domes and minarets of the mosques and shrines create a skyline of more diversity and richness.
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Another impact of topography on urban form, when coupled with the rapid and uneven expansion of the city, has led to a degree of inconsistency in urban fabric, where many land plots are left undeveloped. A number of sites have been regarded as inappropriate or very expensive to be developed.

3.1.1.2. Flood Relief Channels

Located at the foot of the Alburz chain of mountains, Tehran is vulnerable to the flow of the excess water of the heavy rains which sometimes, in the form of floods, attack the city. A number of canals and seasonal rivers, called "maseel", have traditionally channelled this excess water away from built up areas. Since the "maseels" have been used to safeguard the city from flood, they are not usually found in the older areas near the city centre and the south. They are stretched along the valleys to the north of the city, mostly with a north south direction.

The route of these canals and rivers, especially the larger ones, has been effective in defining edges to the development of the fabric. In the built up areas which developed around the suburban villages and along the main arteries, the "maseel" played an important role as the physical boundaries of growth creating gaps in the fabric. However, in some areas they were filled and been developed upon by speculators, which has caused major disasters. These disasters, with few exceptions such as the major flood of the 1987 summer in the north city, have always hit the poor quarters of the south.

3.1.1.3. Water Distribution and Sewage System

The traditional water distribution system (which will be discussed later under the heading Technology), was essentially based on topography, formed of a network of open canals which ran along streets and alleys. In this system, the northern quarters were privileged by receiving the water first.

Another dimension which has added to the privileges of the north is the way sewage is disposed of. In Tehran, which lacks a sewage network, cesspools are the main means of sewage disposal. However, the existence of a large number of cesspools in a city on the slope has led to an underground flow which has polluted many water wells and which appears on the surface of the southern city. This has produced considerable environmental problems for the south.
In absence of a sewage network, the surface waste water, from rain and from watering of trees, has been channelled through the old system of water distribution. In some parts of the city, before the escalation of pollution, these provided a scenery of running water under the rows of trees. However, they are now not more than an open sewage system which in the south find disastrous dimensions in the form of small floods of drainage.

3.1.2. Climate

Tehran, like most parts of the country, has a hot arid climate. The Alburz mountain range cuts it from the Caspian area, the most humid area of Iran with up to 1,950 millimetres annual precipitation (Ganji, 1968). In Tehran, the average temperature in summer is 22.6 degrees centigrade and 11.5 degrees in winter. The annual average being 17 degrees, the temperature can reach a maximum of 44 in summer and a minimum of -14.8 in winter. Throughout the year, there is an average precipitation of 229 millimetres and an average 51 days of frost (MA!, 1986a:11).

3.1.2.1. Climate and Topography

The juxtaposition of high mountains and desert has created a marked change of climate with moving from the upper levels downwards. This striking change of climate is revealed by looking at 1970 climatological data from three stations across the slope (IMO, 1974).

In Sa’dabad Palace, the northernmost station with a latitude of 35 48’N and a height of 1,700 metres above sea level, there has been a total annual precipitation of 309.5mm and 88 days with temperatures below freezing. The daily mean temperature has been 26.1 degrees centigrade in August and 1.2 degrees in January.

Further down in the south city centre, in Park Shahr station located in the old city area, with a latitude of 35 41’N and a height of 1,210 metres, the annual rainfall has totalled 157.6mm with 45 freezing days, both figures nearly half those of Sa’dabad. Here the two daily mean temperatures of January and August have been 3.6 and 28.1, i.e., two degrees higher than Sa’dabad.

The precipitation figure again dramatically changes in Varamin station, beyond the southernmost areas of Tehran and on the edge of the desert. In a latitude of 35 19’N
and a height of 1,000 metres, the total annual rainfall has been only 86.7mm, 55 freezing days, and daily means of 3.9 in January and 28.8 in July.

This climatic change has been very important in determining both social and physical characteristics of urban form. The northern area, because of its cooler summers, has been traditionally preferred by the better-off as their summer residence. Later, with an increase in mobility and availability of fuel, it became their permanent living place, from which they commute to the city centre. This has been reflected in the large plots of land and the large number of trees in the northern areas. As opposed to this, the vicinity of the south to the desert brings with it hotter and dustier summers. Here the smaller land plots are more densely built and the presence of green space is rare.

3.1.2.2. Climate and City Layout

The layout of the old Tehran was strongly adapted to the climate and shared its basic features with many other cities of Iran and the Middle East. It has been argued that the marked uniformity in urban areas of all hot arid zones is due to the dominance of the climatic factor in their urban forms. This has been best characterized by two features: narrow, twisting streets, and large open courtyards and internal gardens. The latter served as reservoirs of cool, fresh air. The former, with their closed vistas, performed the same function by retaining any cool air that may be deposited during the night (Fathy, 1986:64). High walls and deep courtyards were used to ensure this process (Tavassoli, 1982).

The old urban fabric was created as compact as possible to reduce the surfaces which are in direct contact with sunshine and to increase the shaded surfaces. The streets were narrow and twisting with overhangs to create as much shadow as possible. However, it was not the case in the new fabric which was more spaciously laid out with wide streets. In the morphology of new public spaces which emerged, climatic rationality was not usually used as a leading guide. This loss of environmental awareness and predominance of other factors in the making of urban space can also be seen in the choice of building materials and form, although to a lesser extent.

If the increase in the dimensions and forms of streets was not a climatic necessity, the orientation of the dwellings, and subsequently the street pattern, has incorporated a level of environmental rationality. Both the direction of wind and sun are contributing factors to determine the orientation of buildings and street pattern. According to the process of absorption or loss of heat by the great mass of the Alburz range, the
circulation of air in Tehran is dominated by currents which move from the mountains to the valleys or vice versa (De Planhol, 1968: 454-5). This has set the desirable orientation of the buildings along the north-south axis so as to exploit the much needed freshness of the currents during the long summer. If the buildings were slightly turned towards the southwest, as many traditional structures did, they could also benefit from the strong western and southwestern winds (Rahbari, 1986), which entered the region due to the absence of natural barriers.

Choosing the general north-south orientation is consistent with the fact that the main facades should be facing the south to allow the winter sun to enter the buildings. A combination of these two shows the climatic necessity of north-south orientation of dwellings. In the old large courtyard houses, as in Oudlajan, the northern and southern parts of the building were devoted to winter and summer use respectively. When the morphology of land plots changed into geometrical regularity of new land divisions, this migratory system within the house was abandoned. In spite of the loss of the central courtyard as an island of cool fresh air, the new norm, however, remained somewhat consistent with climatic necessity. The rectangular plots were oriented along the north-south axis, the building being located in the northern part of the plot. The new form of land plots confirmed the checkerboard pattern of streets which were set in the 1930s and was widespread in future developments. The main access was through east-west streets leading to north-south arteries.

3.1.2.3. Built Environment and Climatic Change

Every single building modifies the climate outside in its vicinity through affecting the radiation regime of the adjacent areas and through interfering with the wind pattern (Gates, 1972). An urban fabric, as a group of buildings and activities, has a considerable impact on the climate to the extent that it can assume equal importance with regional factors or the influence of topography in controlling local climate. In other words, "the cities create their own climate" (Smith, 1975: 48).

By replacing vegetation with large areas of concrete and brick, the natural radiation balance is disturbed, the wind pattern is limited, and water vapour balance is upset (Munn, 1966). In the city, therefore, radiation, relative humidity, and wind speed fall as opposed to the increase in temperature, clouds and rainfall, and especially containments such as dust particles and carbon dioxide (Peterson, 1969).
The rapid expansion of Tehran has had enormous effects on climatic change. The pressure for development and the lack or the weakness of environmental control resulted in the disappearance of large gardens and farms to be replaced by high density residential areas, creating a city with strikingly small green space. The immediate impact of the climatic change on urban form has been reflected in the drive for further suburbanization. Through generating pollution, this has enhanced and indeed intensified, the north-south structural divide.

3.1.2.4. Atmospheric Pollution

Tehran has been scored as one of the most polluted cities in the world. The presence of 1.8 million motor vehicles, which produce 70 per cent of pollution, together with household fuel and industries in the south have been the causal factors. These are coupled with a high pressure and the encapsulating effect of the mountains.

Although pollution is not one of the physical environmental determinants of form, the topography has helped to cause an unequal distribution of pollution. As an indication to this inequality between the north and south, the gradient impact of pollution on the trees and their associated diseases might be traced throughout the city. The height of the north has given it the privilege of being relatively above the reach of the smog which dominates the city for most of the year. The lower densities here are another factor in diminishing pollution. As against this, the centre, especially the south centre, and the south, are the most polluted areas of Tehran as a result of high residential densities and concentration of commercial and industrial activities, enhanced by its topographical circumstances. The dome of hot air which rises above the centre attracts the polluted air from other quarters of the city.

There have been many attempts to fight against pollution. However, their effectiveness has been minimized by the socio-economic structures represented in the increasing concentration of people and activities in the central areas of the capital city. In the 1960s, legislation limited the location of new industries to outside a radius of 120 kilometres from Tehran. Other policies included provision of parks inside the city, afforestation of the west and south, and encouragement for the use of gas as the household fuel, to replace oil. The new traffic arrangements after the revolution, preventing private cars from entering the city centre, although aimed at improving the traffic, was helpful to reduce pollution.
Nevertheless, the high level of pollution has created circumstances in which none of the traditional environmental solutions which utilized the climatic circumstances would function. Pollution has given rise to further abandonment of the use of natural energy and environmental awareness. Sleeping on the roofs becomes inconvenient, the courtyard ceases to be a welcomed outdoor living place, and its polluted pool is rendered unable to generate freshness. Instead, the use of electrical ventilation and cooling systems have rapidly increased.

3.1.3. Natural Environmental Rationality

The great extent to which urban form is affected and shaped by the environmental factors is quite clear. However, emphasis on the primacy of these factors has tended to lead to an environmental determinism in which the human beings are seen as agents heavily conditioned by their physical environmental context. According to this view, human conduct is only rational when responding to the environment, failing to recognize other forms of rationality which might be at work.

There is no doubt that the traditional urban form, as an adaptation evolved over time, was produced with a higher level of environmental awareness and rationality, properties which seem to have found less importance in building new environments. Nevertheless, this loss should not be seen as a straightforward loss of rationality. It should be regarded as the change of emphasis on new forms of rationality. This has been especially the case in the public domain, since at least a level of environmental awareness has remained at work in the private domain of the dwellings. An example of the shift of rationality in the public domain is the conflict between the climatic rationality of compact urban fabric and the social and economic rationality of vehicular access and hence the rationality of spacious layouts.

It was a rational decision by the past generations to comply as much as possible to natural environmental imperatives. Given their circumstances, it was also a rational decision by the recent generations to be less emphatic about them. Although today we might cast doubt on the degree of rationality of the latter as compared to the former, this reflects a level of freedom in the process of decision making for building new urban fabrics as regards the environmental factors. It shows how the emphasis of decision might change from one awareness to another, resulting in different built forms. It should, however, be noted that, as Simmons (1989) suggests, there is a distinction between the management of the environment and the impact of this
management upon the environment. This implies that the undesirable and irrational outcomes of the environment management, such as atmospheric pollution, can result from seemingly rational conducts.

3.2. Built Environmental Context

In this section, the evolution of the Tehran’s urban fabric is studied. This will be helpful to discover the link between the present urban form and the built space which preceded it. In other words, it provides the information about the built environmental context in which the present day urban fabric has been produced. It concentrates on the development of the built space since the second half of the nineteenth century in its two stages of transformation and the post-war expansion. Before that, however, a brief historical account of the emergence of Tehran as a city and the capital of Iran is given.

3.2.1. Emergence of Tehran

Tehran was originally a village near the ancient city of Ray which has often been regarded as its historical predecessor (Appendix to Chapter Three). The name of the village of Tehran was first mentioned in a chronicle in the eleventh century as the birthplace of a famous scholar (Khatib Baghdadi, in Semsar, 1986). In the twelfth century, it was reported as being prosperous and famous for its pomegranate (Ibn-Balkhi, in Semsar, 1986). In the thirteenth century it was described as a large village below the ground level, which located six kilometres away from Ray and was surrounded by a security zone of gardens. The village had twelve rival quarters whose people were known for their defiance to the government (Yaqut, in Semsar, 1986). The Spanish ambassador to Timur, Clavijo, described Tehran of 1404 as very large with no walls, well supplied with everything, and delightful (Sykes, 1902).

The strategic location of Tehran and its gardens attracted the Safavid king, Tahmasb, who in 1553 (961 A.H) built a wall around it, which gave Tehran the status of a city. It was six thousand steps in circuit with 114 towers, on the pattern of the 114 Sura of the Quran, with four gates and a moat (Semsar, 1986). Like other Persian towns (Barthold, 1984), Tehran had a quadrangular shape with four gates opened on its four sides.

Tehran which had become a trading centre and a regional capital was described by Pietro della Valle in 1618 as "a large city...but not well peopled, nor containing many
houses, the gardens being extremely large, and producing abundance of fruit of various descriptions" (Curzon,1892: 301-2). He admired the city for its lofty plane-trees shading the streets which were watered by considerable streamlets. However, "excepting these", he added, "Teheran possesses nothing, not even a single building worthy of notice". Sir Thomas Herbert in 1627 referred to the 3,000 houses built by mud brick and to the residence of the governor and the bazaar, the latter being only partly roofed (Curzon,1892:302).

In the seventeenth century, Shah Abbas built a "Charbagh" (Four Gardens), and a "Chenarestan" (Plane Grove) within the walls to the north of the city, around which walls were built later and was called "Arg" (Citadel). Tehran became a temporary court of the Safavid kings and a palace was built in the citadel by Shah Suleiman (Zaka,1970). Another gate to the north of the city, Arg or later Dowlat gate, was opened by the Afghan invaders in the eighteenth century to provide a secure exit without passing through the town. After the Safavids, Karim-khan Zand in 1172-3 A.H added to the buildings of the Arg and fortified it with walls and a moat (Zaka,1970; Najmi,1984).

3.2.2. Tehran the Capital

Tehran was chosen by Agha Muhammad Khan, the founder of the Qajar dynasty, as the capital of Iran in 1785-6 (1200 A.H), mainly due to its central position and its vicinity to the tribal territories of the Qajars (Lockhart, 1960). Becoming the capital, the city started to flourish. In 1797, the city was only two miles in circuit and a fifth of its 15,000 population belonged to the court or the army (Oliver,in Curzon,1892). Within the space of little more than a decade, there were about 50,000 people living in 12,000 houses (Gardanne;Morier;Ouseley, in Curzon, 1892).

The second Qajar ruler, Fath Ali Shah (1834-48), tried to embellish the capital by constructing palaces and mosques (Hillenbrand,1986b; Lockhart,1960). Under his successor, Muhammad Shah, a sixth gate was opened to the city.

3.2.3. The Structure of the Old City

The structure of the city, an area of about four square kilometres enclosed within the Safavid walls of 1553 (Kariman,1976:223,298), comprised of a citadel on the northern
side, which was connected to the southern gate of Hazrat-Abdul-Azim through the axis of bazaar. To this axis were attached the Friday and Shah mosques. The rest of the town, in the form of four residential quarters, was clustered around this axis (Figure 3.2).

This axial city structure, therefore, was defined functionally: a political authority (royal compound), an economic centre (bazaar), a religious focus (Friday mosque) and living places (four quarters).

The surrounding walls of the city formed a polygon, opened by six gates, and enclosed by a moat. The mud city wall, ruinous in parts, was six metres high and flanked by circular towers, and was defended by a moat twelve metres wide and six to nine metres deep (Curzon, 1892). The rectangular citadel had also walls and moats of its own.

Two neighbouring squares formed the main foci of the city structure: the "Maydan-e-Arg" (Citadel Square), immediately inside the citadel as its entrance, and the "Sabzeh Maydan" (Herbs Market) (Browne, 1926), or market square, immediately outside the citadel, as the main entrance to the bazaar. These two squares, which were connected by the citadel’s gate and a wooden bridge over the citadel’s moat, were the converging point of the citadel and the bazaar and the meeting place of the townspeople with each other and with the authorities. The citadel square, enclosed within the walls of the citadel had four gates on its four sides and, as a sign of royal supremacy, a number of canons in the middle, surrounded by the artillery personnel housed in the arcades around the square (Zaka, 1970). The market square, however, being more accessible to the public was usually known as the main city square.

The four living quarters were not physically separated from each other. Each of them had a main thoroughfare which led to the main axis of the city, the bazaar, through several minor squares. These urban arteries found more and more commercial character by approaching the bazaar, eventually becoming a branch of it, a "Bazaarcheh", a small bazaar (Faghih, 1988). In 1852, each of the living quarters, had, on average, 1,900 houses, 645 shops (apart from the main bazaar), 36 public baths, and 35 mosques, "madraseh" (religious school), and "takyeh" (place of religious ceremony). Each quarter housed a mixture of lower and higher social classes (Ettehadieh, 1983).
Figure 3.2. Tehran in 1858

Figure 3.3. Tehran in 1890, After the First Transformation
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The appearance of the Qajars' capital was not impressive for many of the travellers who compared it with the glories of the Safavid capital, Esfahan, or with the Victorian splendour of European capitals (De Planhol, 1968). Its location in the hollow of a plain, its dense fabric, its narrow, twisting, dusty streets and, apart from the citadel, its unpretentious buildings (Curzon, 1892), with flat roofs and blank facades (Pollock, in Semsar, 1986), are all features of the city which have been described with negative tones.

3.2.4. The First Transformation of the City

The first attempts to transform the old city were made during the long reign of Nasser al-Din Shah (1848-1896). The resulting changes in the city structure were so dramatic that, according to an observer, "the visitors in the first half of this [nineteenth] century would barely recognise it", featuring what was regarded as the second stage of a "twofold renaissance", the first one being becoming the capital of Tehran (Curzon, 1892:300).

The process of change, which embraced the whole city, started from the royal compound, by the reformist vizier Amir Kabir, by restoring its walls, improving its streets for the movement of vehicles (Najmi, 1984), and laying out a new, large square, Tup-Khaneh. The two main squares were also improved and beautified (Zaka, 1970; Najmi, 1984).

However, these minor improvements were only a prelude to the major changes of 1868, the focal point for the transformation of Tehran, when the Shah decided to expand the city (Figure 3.3). By this time, Tehran, with its 150,000 population, had reached its limits of development within the old walls. A number of extramural gardens and residences, housing more than a tenth of the city's population (Ettehadieh, 1983) had started to grow. Mostowfi- al-Mamalek, the grand vizier, and Mirza Issa, the minister for the capital, who were ordered by the Shah to prepare plans for the expansion, set up a team headed by General Buhler, a French teacher in Dar-al-Fonun, the institute of technology. The new plan of the city was a perfect octagon, enclosed by moats and walls, with 58 spear-head shaped bastions, which were pierced with twelve gates (Zaka, 1970; Alemi, 1985).

The construction started in 1868 (1284 A.H) and was not completed until twelve years later (Zaka, 1970). The old walls were pulled down and the moat filled. The new moat
and walls, at a distance of a mile from the old walls (Curzon, 1892), were built which included the recently developed suburbs. The circumvallated city, being about 18 square kilometres, was now four and a half times the size of the old city (Kariman, 1976; 223, 298). The twelve new gates on four sides were monumental structures decorated with glazing tiles. However, the rampart and fosse, which were not equipped with canons, were regarded as having little or no defensive value (Curzon, 1892).

This first expansion of the city, like most of the subsequent phases of its development, was mostly northward. The filled moats around the citadel were turned into new avenues and a new focus was created for the city in the form of a new square, Tup-Khaneh, which was attached to the northern boundary of the royal compound. This was a large quadrangle enclosed with two storey arches which housed, in the ground floor, the canons and, in the upper floor, the artillery staff. This square was the converging point of six new, wide streets each having a gate, decorated with glazed tiles, at its entry to the square.

The most important building flanking the Tup-Khaneh square was the Imperial Bank of Persia. This was a new economic institution with international connections, as compared to the traditional economic institution of the bazaar whose entrance flanked the old market square. To the north of the Tup-Khaneh square located the new quarters which were the houses of the aristocracy and the embassies, delegations, and residences of Europeans. In and around the new square, especially to the north, new institutions were built. Apart from the bank, there were hotels, European shops, an institute of technology, an hospital, and a telegraph house.

Within the new walls, a new urban structure emerged whose geographical centre piece was the royal compound (Scarce, 1983). It was different from the old structure in which this compound was located on the northern side of the city. The royal compound, which used to be connected to the city by a sequence of two squares, found two more contacting points. However, the importance of the third square, Shams-al-Emareh, was later reduced, leaving the two squares, to the north and south of the citadel, as the focal points of the urban space. Therefore, this created a bipolar urban structure with a dual morphology: the old square flanked with the old, traditional institutions housed in old structures; and the new square flanked with new institutions housed in new structures. This bipolarity of the city was the first manifestation of what became to be an ever enduring north-south divide. As opposed to the old structure with a highly specialized
land use pattern, the new structure provided, and it was intensified later, the basis of a mixture of uses along the new street frontages.

The nature of squares did not change as compared to the new approach to the streets. Compared to the narrow, twisting streets which, when they became main arteries like bazaars, were partly roofed, the new streets were wide, straight, and unroofed. However, they were not yet forming a network of streets connecting to the points of entry to the city. Only seven of the twelve gates were linked up with the newly laid streets (Faghih, 1988). Since the new city boundaries were planned to allow for future developments and expansion, there was vacant land between the walls and the urban fabric which seemed so displeasing to some observers (Sykes, 1902:178).

A number of the new streets, Nasserieh, Lalehzar, Ala-al-Dowleh, came to be known as the most attractive places for the townspeople. These were comparatively wide streets which were cobbled; with separated pavements lined with trees which were watered with streamlets; and flanked with one or two storey structures of shops and houses.

Even after the erection of the new city walls, suburban gardens and villages, especially towards the north of the city, were being developed outside the walls to be used as the summer retreats by the wealthy. The green belt of the gardens around the city was so thick that travellers described Tehran as a city within a forest (Bell, 1928) or "a city of mud in an oasis of plane trees" (Arnold, in Graham, 1979:22). Some of the gardens, like Yousefabad and Behjatabad were within a short walking distance from the walls (Browne, 1926:95), which became new quarters subsequently.

The city grew rapidly during the next decades. However, this expansion, which was centrifugally patterned, did not extend beyond the walls and moats (Farmanfarmaian & Gruen, 1968). By the turn of the century, the number of houses doubled and commercial activities flourished. In 1902, the number of caravanserais was 2.5 times and shops 4 times those of fifty years earlier. Parallel to it, a secular trend was reflected in the decreasing number of religious institutions (Ettehadieh, 1983).

3.2.5. The Second Stage of Transformation

The city continued to grow. The population density increased from 43.5 persons per hectare in 1883 to 65.5 in 1891, 80.5 in 1922, and 105 in 1932. During the inter-war period, its population rose to about 0.7 million (VBB, 1987a). The second major
Figure 3.4.
Tehran in 1937, After the Second Transformation
The twelve gates of the city, together with numerous other structures, were destroyed during the mayoralty of General Karim Bouzarjomehri in 1930 for "modernization of the city" (Zaka, 1970:16). As with the first stage, the route of the moats and walls provided the space for constructing wide boulevards. Apart from these, new streets were built, cutting the old fabric of the city which was regarded as a group of "squalid and congested areas" (Lockhart, 1960:7). The result was, as shown in the 1937 map of the city (Figure 3.4) a transport network (Faghih, 1988), 218 kilometres long (Farmanfarmaian & Gruen, 1968).

The royal compound was fragmented, its buildings redeveloped, to be replaced by a new government quarter, mainly ministries of Justice and Finance. The buildings which survived turned into other uses, like the Golestan palace which became a museum.

With the pressure put on the traditional institutions, the retailers were encouraged to move to the new street frontages and abandon the old streets of bazaar which were not accessible by car and threatened by redevelopment.

The new streets, which were cobbled, intersected at right angles and at many of the crossroads were placed monuments and fountains (Lockhart, 1960; Wilber, 1986). The streets became the main channels of transportation and the squares became the traffic circles, as distinct from the older squares and streets which were the places of communication for pedestrians.

Two more important streets, Shah-Reza and Pahlavi, both named after the ruler, eventually formed the main east-west and north-south axes of the city structure (Figure 3.5). The latter was more than 20 kilometres long which started from the railway station in the south, linked to the new Trans-Iranian network. It passed Kakh-e-Marmar (Marble Palace), which was built by the Shah as the place of receptions and official functions. Around this palace were built a number of less important palaces as the private residences of the royal family. The Pahlavi avenue, which was lined with trees,
Figure 3.5.
The Main Axes of the City
finally ended at the foot of the Alburz mountain, in the northernmost part of the present city, where another palace compound, Sa’dabad, was developed (Wilber, 1986; Lockhart, 1960; Falamaki, 1988). The other avenue, Shah-Reza, which was built on the filled northern moat, was an east-west axis which intersected Pahlavi at right angles and along it were erected new institutions such as the Tehran University.

All the property in a large quarter of the old town, Sangeladj, neighbouring the citadel from the west, was bought and rased to the ground to set up a stock exchange and the related economic institutions. But this project stopped due to the beginning of the second world war and the High Technical Council of the city suggested to develop a new living quarter. This quarter, it was argued, was to serve as the living place of the inhabitants of another old quarter which in turn would go under a complete redevelopment (Azhdari, 1964). Finally, the area was, according to the decision of the Parliament, turned into the central park of the city.

The process of suburbanization which had started in the second half of the nineteenth century with the building of large extramural gardens by the aristocracy, intensified after the first world war. The merchants and the tradesmen, in spite of their working place being in the bazaar, moved out from the area to northern and western suburban residences which had better climates. This led to a deterioration of the old fabric (Motamani, 1964), which has been a feature of the central and southern parts of the city up to the present day. The destruction of the walls in 1930 was in fact to lift the physical barriers to the escalating urban development process. By 1929, the city was already 24 square kilometres, implying that a third of the urban fabric was built beyond the walls. After the filling of the moats by 1934, Tehran had an area of 46 square kilometres (Kariman, 1976:298).

3.2.6. The Post-war Development of the City

The post-war stage of the development of Tehran was very rapid and uncontrolled. Within 45 years after 1941, its population grew 8.6 times and its area 12 times. It has taken the form of free expansion of the city into the surrounding land and the growth of suburban villages and satellite townlets which have been gradually integrating into the urban fabric by the new waves of expansion and development ever since (Figure 3.6). The form of the built-up areas now seemed to be a radial expansion of a core across the outgoing roads, transformed into a westward expanding metropolis.
Figure 3.6.
Urban Development 1937-1971

1937-1955

1955-1971
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The rapid and unprecedented growth of the city caused the disappearance of the suburban and intra-urban gardens which were subdivided and built over.

The control over the post-war development was so absent that a deputy mayor of Tehran in 1962 commented that in this city "the buildings and towns have been developed by whoever has wanted in whatever way and wherever they have wanted". The results of this was that Tehran was "in fact a number of towns connected to each other in an inappropriate way" (Nafisi, 1964:426).

The segregation of the suburban settlements from each other, was due to, and provided for, the geographical segregation of the social classes. This has become so manifest that in Tehran it was possible to see "a social gradient on the grand scale...on the ground" (Costello, 1977:99). The density in the southern areas reached a peak of 610 persons per hectare in 1956 as compared to the northern areas which always remained low (Farmanfarmaian & Gruen, 1968).

Many of the suburban townlets, such as Shahrara, were developed on pure speculative bases to respond to the high demand of housing in the rapidly growing capital. Others, such as Yousefabad and Narmak, were provided by the public sector for the ever increasing numbers of civil servants.

Whatever the way in which these settlements were developed, they suffered from poor services (Golestani, 1964; Badi’, 1964). Inside the settlements, gradually, town centres developed in the form of high streets, or at the intersection of the main streets, which were usually providing very basic services. For most of the required services, however, they had to rely on the city centre.

During three decades, the size of the physical fabric of Tehran grew fourfold to reach 180 square kilometres in the mid-1960s (Farmanfarmaian & Gruen, 1968). Its population rose even faster, to reach 1.5 million in 1956 and to about three million in 1966. By 1976, the population increased to 4.5 million in a city of 250 sq.km. During the next decade, another 1.5 million were added to the population of Tehran and, with the extension of municipal boundaries, its size more than doubled (VBB, 1987a). The pace of urban development can be traced in the fact that in 1980 about 60 per cent of the dwellings had been built during the space of the previous thirteen years (MAI, 1981).
In the mid-1960s, about 40 per cent of the urban area was occupied by residential use. Next to it was the transportation network with about 27 per cent. Two other land-consuming uses were government institutions and industries each with 10 per cent of the urban area. Trades were housed in 4 per cent and the rest was used by other uses such as health, education, recreation, etc (Farmanfarmaian & Gruen,1968).

In the southern parts of the city, the majority of small industrial establishments, which formed 96 per cent of all the industries, were spread and mixed with residential areas. Large industries, which constituted only 4 per cent of industrial establishments but employed 66 per cent of the industrial workforce, were mostly located in the west and southwest along the routes to the nearby city of Karaj.

3.2.7. Contextual Rationality

Every new addition to or modification of urban fabric, from the level of single buildings up to the whole urban structure, has to be carried out with some consideration of the existing fabric. Whatever the viewpoint and the outcome of these considerations, enhancing or disregarding the existing fabric, it has some impact on future developments.

During the first three hundred years of Tehran’s urban life, from the building of 1553 walls to the restructuring of 1868, the main approach, as regards the context of built space, was one of consensus and conformity. Throughout this period, no large scale transformation of urban fabric had occurred. Due to various constraints which limited the agents of production, every act of development had to be carefully set against its built context, and the outcome was usually respectful and adaptable to it.

This contextual rationality, however, could not survive the two major phases of transition in the 1870s and 1930s. During the former, it was tried to create a balance between old and new. Therefore, the new quarters were juxtaposed to the old ones without attempting to transform them. Here, a degree of respect and adaptation was present. However, the extent of conformity to the old fabric was largely diminished. The new patterns of streets and buildings in the new quarters were put forward as a rival as well as a complement to the old ones. The break with contextual rationality, which created a dualism in the typology of physical fabric, was consistent with the break in social structure which was on the way.
This cautious attempt to modernization still paid respect to traditions and the old urban fabric. The fierce attack on these two, however, came with the major attempt of the 1930s, which with a total disregard of the old fabric, tore it apart. The new network of streets, which were imposed on it, were to build new facades as soon as possible to hide whatever remained from the old fabric. The long term trend was to eliminate the latter to be replaced with a modern fabric with minimal relationship with what it succeeded.

The framework which this cry for modernity set provided the basis for the future development of the city. The sheer size of the post-war development of the urban fabric, in which the principle of minimal relationship with the past was maintained, reduced, and virtually nullified, the proportion of the old fabric to, and its impact on, new developments. After all, the pre-1868 Tehran forms only 0.7 per cent of the present day urban area.

In the new developments, a position was needed to be taken towards the existing fabric. In most cases, however, this context was itself a newly developed part of fabric, due to the rapid pace of urban expansion. What emerged from the new circumstances was a new form of contextual rationality.

In the nineteenth century, conformity with the context was more physical than social, in the sense that in a quarter with a consistent built form, at least in terms of their external appearance, a mixture of classes lived nearby. The contextual rationality of the twentieth century, however, took both physical and social forms, stressing the latter.

On the one hand, the market forces and the new planning system ensured that the social status of the new development and its occupiers match their context, hence emphasizing the sectoral development of urban structure and its north-south divide. On the other hand, the nature of the developing agents and their limited abilities and instruments, combined with the rapid pace of urban development, had enormous impacts on the built form. They paid respect to short lived fashions and architectural styles which, once established, spread very rapidly throughout the city, which led to the development of entire urban quarters with a large degree of uniformity.

Whereas now this interpretation of contextual rationality is still strongly at work, a change of approach has started to develop since the 1970s. The necessity of total disregard of the older fabrics is less stressed and some attempts have been made to revitalize parts of the them. This confirms the continuing impact of the existing fabrics.
in the future developments even if their physical presence has been considerably reduced. It should be noted that, in a stage where the physical presence of a form is diminished, disappeared, or even has never materialized, it becomes a concept of space, which is separately discussed.

It is noteworthy, however, that any over-emphasis being put on the impact of the context would lead to inconsistent results. For example, most medieval mosques have been built on irregular sites in the midst of bazaars, sometimes on the site of earlier buildings. Hillenbrand (1983:18) argues that these contextual constraints resulted sometimes in haphazard plans, discouraged carefully designed external facades, and may explain the Islamic architects' preference for inner facades. The latter point seems to be a generalization of, and a primary emphasis on, the importance of the built environmental context. Although there is an element of relevance in this argument, it tends to undermine other reasons for the inward looking forms.

3.3. Conclusion

The natural and built environments of Tehran have changed considerably since the nineteenth century and, more dramatically, since the second world war. The natural environment in which Tehran has been located and developed, with its special topography and climate, has provided a setting in which the social transformation has taken place. Also this natural environment itself has been changed with the social transformation which resulted from the development of a metropolis in it. In this process of modification, the longstanding, environmental rationality was undermined in favour of other forms of rationality.

In the study of the built environmental context, the process of the evolution of Tehran shows how the traditional urban fabric has been transformed dramatically in its overall dimensions and in the key public domains. It also shows that how this transformation has left the rest of the urban space, the lesser public places and the private domains, to adjust themselves to the changes. Above all, it set the pattern for future developments which have made the present day urban form.

In doing so, the traditional contextual rationality, in which new developments respected and complied with the existing ones, changed into one with a total disregard of the past. Nevertheless, new forms of rationality, now in both physical and social dimensions, emerged in the context of the ever expanding modern urban fabric. In this
way, both the natural and built environmental contexts have been transformed to become rational against the new demands of the day. Once this has been achieved, the modified contexts have started to exert powerful influences upon the development agencies who themselves have been instrumental in this modification. The development agencies have been encouraged to foster the process of transformation of town and countryside, while, at the same time, be confined to the new patterns and constraints that this very transformation has put forward.
This chapter deals with the context which the social environment has provided for the development of the Tehran’s urban fabric. It investigates, very briefly, the transformation of society and the challenges to it through focusing on the most general levels of economic, political, and social change since the second half of the nineteenth century. Although it bears a risk of oversimplification of complex developments, it helps to understand the societal dynamics which led to the production and transformations of urban fabric, those to which the previous chapter has referred.

This investigation is expected to introduce the social setting of the development process and illustrate the main mechanisms of the social context through which the development agencies have produced the built environment. It is, therefore, meant to be a supplement to the previous chapter, the two chapters depicting the physical and social scene in which development takes place. The investigation will be scaled down in the next three chapters which will focus on the development process through development agencies and their involvement with development factors.

The analysis of the social context has needed to be broad enough to account for the general processes such as urbanization and the way Tehran has emerged as the primary city of the country. This is why the discussions of this chapter focus on a wider social environment, that of Iran and the role of Tehran within it.

4.1. Transformation of Iranian Society

Tehran became a city under the Safavid dynasty (1598-1722), who had a strong central government and a flourishing economy. The city gradually grew, a process which, after a period of quiescence, was intensified in the nineteenth century.

The collapse of the Safavids was followed by a period of economic decline and political decentralization throughout the eighteenth century. Although in the early years of the establishment of the Qajar dynasty (1779-1925), under whom Tehran was chosen as the capital city, a rapid economic recovery occurred, the country suffered from depopulation, poverty, and economic exhaustion (Issawi, 1971:13).

In the early nineteenth century, the territorial structure, similar to the previous Persian empires, consisted of provinces under governors appointed by the central government and provinces under tributaries. Whereas the former were more or less closely attached
to the central government, the latter remained autonomous in their affairs acknowledging the nominal authority of the shah (Lambton, 1987:42).

The extent of authority of the central government was limited due to the vastness of the country, lack of communication, and the existence of regional power structures of tribal leaders and large landowners. This was coupled with the diversity of communities with different ethnic origin, language, and religion.

The great majority of the population, about 80-85 per cent, were engaged in agriculture and rearing of livestock. In the mid-nineteenth century, about 58-59 per cent of Iran's nine to ten million population lived in rural settlements (Gilbar, 1976). The basis of the village economy was the production of wheat and barley, the staple food of the people, and also a considerable variety of other crops.

Animal husbandry, as mainly carried on by the nomadic or semi-nomadic tribes, who constituted a third of the population, was another important basis in the country's economy. The relationship between the nomadic tribes and the settled people was based on the exchange of their products (Lambton, 1987:48-51; Gilbar, 1976).

These groups constituted relatively self-sufficient, closed economies mostly confined to the regional boundaries, due to geographical difficulties as well as social complexities and communal structure. Its limited surplus, therefore, did not allow the growth of urban centres. Only 8-9 per cent of the population lived in towns of 10,000 or more inhabitants (Gilbar, 1976).

The towns were the political, administrative, and commercial centres, and the rural areas produced the agricultural products which were the main source of income. As in the rest of the Middle East, they were identified to form a rural-urban continuum, leaning on each other, constituting a relationship in favour of the urban centres (Hourani, 1970; Cahen, 1970; English, 1966). The basic function of the towns was, thus, not production but control and distribution of national surplus, which was produced in the countryside, through political power and exchange mechanisms (Amirahmadi & Kiafar, 1987).

In the early nineteenth century, the importance of foreign trade in the country's economy was considerably diminished. Since the sixteenth century, the overseas trade route between the Far East and the West had caused a decline in the overland trade
route, the Silk Road, of which Iran was a middle point. The east-west trade axis in Iran which had survived was finally sealed off in the early nineteenth century (Avery & Simmons, 1980). The production and export of silk, the major export item of the country, also decreased and reached very low levels by the middle of the 1860s (Gilbar, 1979).

Despite its differences with Western feudalism (Katouzian, 1981), this society is loosely called feudal, mainly because of the power being derived from the possession of land, existence of a subject peasantry, fragmentation of authority, and the military character of the ruling class (Lambton, 1987:x-xi).

In spite of the existence of socio-economic stratification, the strength of communal bonds prevented the formation of class consciousness and state-wide socio-political classes. The communities, whether tribal, rural, or urban, were almost all similarly organized hierarchically. The rich and poor were tied together especially through tribal lineages, religious sects, regional organizations, and paternalistic sentiments (Abrahamian, 1982). Inherent in the diversity of the communities, whose unit could be a city quarter, a village, a tribal camp, a religious community, or a corporate organization, was the communal conflict between these groups, not dissimilar to the strife in feudal Europe of the Middle Ages (Vance, 1977).

In terms of urban form, the spatial manifestation of this social and economic parochialism was the quarter system (Appendix to Chapter Four). Like most other Islamic cities, Tehran was formed of a number of quarters as distinguishable social and physical entities, each with their own centres.

4.1.1. First Transformations

This society, which had shown a striking structural continuity throughout its history (Wilber, 1963), underwent a radical change from the nineteenth century, mainly through interaction with the West. Mostly from the middle of the century, a process of transition into capitalism, through participation of Iran in the world commodity exchange, started which tended to restructure the whole society and its institutions ever after and also had a major effect on urban form.

In the last two hundred years, the dominant theme of the economic, and social, history of Iran, within a wider Middle Eastern context, has been a "reaction" or a "response" to
an "impact" or "challenge" (Issawi, 1982:1). The latter was put forward by the worldwide expansion of the industrializing, capitalist Europe in search of food, raw materials, markets, and outlets for its energy, capital, and population. As the history of Iran in the present century shows, with two revolutions and two coups d'etat, the political response to this challenge has varied from cautious attempts to reconciliation to total assimilation or rejection.

The first motivators of change were political (Lambton, 1987). The defeats which were imposed on the Persian empire through wars with Russia in 1813 and 1826 and with Great Britain in 1856-7, led to the contraction of its territory. The military advancement of the two rival powers from the north and south was followed by their political and economic influence.

Foreign trade increased and unequal treaties and concessions gave the foreign traders superiority to their Iranian counterparts (Keddie, 1981). The exemption of the former from internal duties and taxes as against the latter who were subjected to numerous arbitrary taxes opened the Iranian markets to foreign capital and goods. Commercial services were monopolized by the Russians and the British so that a north-south trade axis, as against the then obsolete east-west axis, was developed (Avery & Simmons, 1980).

The subsistence crops, wheat and barley, were replaced by export crops such as cotton, rice, opium, and fruit (Lambton, 1987; Issawi, 1971). Although this process resulted in an increase in cultivation and production (Gilbar, 1979), it led to an increase in the social stratification of the countryside (Keddie, 1981). The landlords strengthened their hold on the land and, as land became freely alienable, the newly grown merchant class invested in land and private ownership grew. As against this, most peasants lost their traditional land rights and became landless share-croppers (Keddie in Issawi, 1971). It also deepened the gulf between the rural and urban population (Lambton, 1987), and, through reduction in the production of subsistence crops, helped developing social crises such as bread riots and disasters such as the great countrywide famine of 1869-72 (Keddie, 1981).

During the second half of the nineteenth century, unemployment rose and the proportion of artisans declined in favour of commerce and services (Gilbar, 1976). The locally produced handicrafts were also replaced by imported manufactures, which was beneficial for merchants and some consumers and detrimental for artisan and trading
groups. The latter lost the employment and income which the home industries provided, without being compensated by the development of manufacturing industries (Keddie, 1981; in Issawi, 1971).

These developments linked Iran's economy to the world economy so that the worldwide devaluation of silver, the country's currency, or fluctuations in the supply and demand of cash crops had far-reaching effects on the country's economy (Gilbar, 1979; Avery & Simmons, 1980).

The whole financial system was subjected to foreign capital through loans and banks. The economy was gradually restructured to export raw materials and import manufactures. The nascent native bourgeoisie started to invest in farming whose products were in great demand in the world market. This had a disastrous impact on the primitive accumulation of capital and on the character of the national bourgeoisie, putting it in a dependent position (Abdullaev, in Issawi, 1971).

The dependent economic relations with the West which resulted is best indicated by the drain it had caused. An overall trade deficit started from the 1860s onwards (Issawi, 1971), especially in the southern areas, which caused an outward drain of money (Avery & Simmons, 1980). In the late nineteenth century, the volume of raw materials which Iran exported was five times larger than that of the imported finished goods, while the price of the latter was three times more than the former (Keddie, in Issawi, 1971).

At the turn of the century, the ten million population of Iran with a net growth rate of under 1 per cent was slightly higher than fifty years before due to epidemics and famine (Gilbar, 1976).

The relaxation of the old economic structure gave rise to a change in the structure of population. The proportion of nomads reduced to a fourth of the population and the overall percentage of those engaged in the primary sector reduced to 70. Especially from 1870, a marked increase in the urban population occurred to reach 18 per cent of the population in the early 1900s (Gilbar, 1976). This was in line with a greater degree of social and spatial mobility. It took the form of migration from the rural areas and small towns to provincial centres and the capital; international emigration, especially to Russia; and, within Tehran, a level of suburbanization.
The population of Tehran grew threefold during the nineteenth century to reach about 150,000 in 1910 (Ettehadieh, 1983). Despite the heavy losses of life after the outbreak of cholera in 1846 and 1852, the population of Tehran grew and the city spread beyond the limits of its physical boundary. In the late 1860s, the extramural inhabitants formed a tenth of its population (Ettehadieh, 1983). It was partly due to this factor and the development pressure from inside that the city was restructured.

In these developments, Tehran found a commercial importance, as reflected in the considerable increase in the number of traders and shopkeepers in the city (Ettehadieh, 1983). This, which attracted more people to the capital, was not due to its industries or agricultural production, but to its location along the main internal trade routes and the presence in it of the royal court (Issawi, 1971).

The commodification of agricultural land and produce was the first step taken towards the development of a capitalist production system and integration into the world market. It was not surprising that this process was extended soon to the urban space. The first transformation of Tehran's urban fabric should be seen in this light, its role being the opening up of the urban structure to the emerging production system. Nevertheless, this was a modest step when compared to the second phase of transformation which aimed at making the urban fabric more appropriate for capitalist production through creation and improvement of infrastructures.

Urban transformation in Tehran not only helped in establishing the national and international importance of the capital, but also had immediate economic and social impacts by providing a new source of revenue for the government. The inclusion of the newly developed suburban areas within the city walls extended the basis of the "gate tax" which the government charged (Curzon, 1892). The construction activities attracted large numbers of unskilled workers from the surrounding countryside (Gilbar, 1976) who came to live in the southern areas of the city. They formed the lowest stratum of the society and had an intensifying impact on social and spatial stratification of the city.

The impact of foreign economic and political influence and the subsequent involvement of Iran in international trade as a dependent partner had an instrumental effect on the stratification of society. On the one hand were the upper classes of courtiers, merchants, tribal chiefs and landlords, along with Europeans and religious minorities whose economic importance grew through their connection with Europeans. On the other hand were the tribal masses, the landless or nearly landless peasants, and
the urban poor along with traditional and religious classes (Lambton, 1987; Abrahamian, 1982; Issawi, 1971).

Following the gradual disintegration of communal bonds and beginning of the formation of new social classes, especially in urban areas, the space was to be adapted accordingly. The 1868 reform of Tehran's physical structure partly aimed to accommodate this new, polarizing social structure by the expansion of the city and creation of new upper class quarters. In the new urban structure the upper and lower classes were housed separately in the north and the south city. A process of spatial segregation of social classes started which was to constitute the most important feature of the city ever since.

Central government assumed only basic functions such as defence and the conduct of foreign affairs (Yapp, 1977). In 1900, the annual governmental budget being only about 2 per cent of the GNP, the influence of the state on the economy was extremely weak (Bharier, 1971:5). The main purpose of the bureaucracy was collecting taxes to support the army and the royal family. Public works were seldom undertaken. Most of the functions that are considered as governmental, including all levels of education, most forms of judicial and legal activity, and social and charitable services, were carried out by the religious authorities (Keddie, 1981:29-31).

The authority of the state was partly limited by the feudal character of the court. It was also checked by the existence of rivalry: internally between the various groups and communities which constituted the society; and externally between the two major powers of Russia and Britain. The policy of the government in this respect was based on trying to maintain this strife to be able to keep the independence of the country and secure its rule over it (Lambton, 1987; Abrahamian, 1982). This was an intermediary role which was reflected in the spatial structure of the city both before and after the transformation.

In the second half of the nineteenth century, in line with the limited development of regional and national markets and some improvement in communication, a move was made towards political centralization. It extended the authority of the government to the more remote districts (Lambton, 1987:44). Gradually the "men of the pen" played a more important role in the state affairs as compared to the "men of the sword" who formed the dominant group in the earlier part of the century. The former developed a highly centralized and elaborately organized bureaucratic system on the pattern
practised by the Saljuq, Ilkhanid, and Safavid empires. However, in absence of an effective system of financial control, the high degree of provincial independence remained intact (Lambton, 1987:216-7).

The increase in the degree of centralization of political power and expansion of bureaucracy, limited though it was, is reflected in the government's ability to undertake such a task as a major urban development scheme. In spatial terms, the growing power of the state is reflected in the new structure of Tehran. With the expansion of the city and the emergence of a new spatial structure, the royal compound stood at its middle point.

4.1.2. Protest and Reform

As against the increasingly weak and dependent political and economic structure of the society, two major trends of protest and reform are traceable throughout the nineteenth century, and indeed until the end of the Qajar period in the early twentieth century. One trend seeks to reform the country on the model of the industrialized capitalist countries of the West; and the other attempts to reject the foreign political and economic influence and rely on the traditional ways. This duality has been called continuity and change (Wilber, 1963), traditionalism and modernism (Yapp, 1977),

At their extremes, they appear to be most contradictory: the latter manifests a tendency towards maintaining the existing feudal-tribal structure, whereas the former shows a trend towards total assimilation with the capitalist industrialized countries of the West. However, they have collaborated in numerous instances, as best exemplified by the Constitutional Revolution of 1906-11.

As early as the 1830s both the opposition to the foreign influence and attempts to reform started. This was a time in which the hand-manufacturers and merchants protested against the rising tide of European imports which were ruining their trades (Keddie, 1981). These protests continued throughout the century and some of them, such as the protest against the tobacco concession, became more important. The culmination of this process is manifested in the Constitutional Revolution of 1906.

The beginning of the process of reforms in the 1830s is also marked by the prince Abbas Mirza’s attempts to modernize the army, after the two Russians wars. The military superiority of Iran’s opponents caused the tendency in Iranians of studying the
technical achievements, the art and science, and the advantages inherent in the social and economic structure of Europe (Alavi, 1983). The reforms which followed were "from above", which were usually carried out by the high ranking officials (Keddie, 1981). Some reforms were supported by, or even started by, the shah. The urban improvements under Amir Kabir and the restructuring of Tehran under Nasser al-Din Shah were of such reforms. They were among other reforms such as establishing in the capital a secular school, a medical clinic, a central mint, a regular police force, and a municipal service (Abrahamian, 1982:57).

However, what was detrimental to major reforms was identified as the arbitrary nature of the monarchs' power (Yarshater, 1983; Alavi, 1983; Lambton, 1987). The Constitutional Revolution of 1906 was aimed at checking the royal absolute power by setting up a national assembly with the power of controlling the state.

In the early twentieth century, the longstanding discontent from government mismanagement and foreign influence, which had reduced Iran to a buffer state (McLean, 1979), together with a deepened economic crisis led to the Constitutional Revolution of 1906. However, the decline in the authority of the central government which followed, the economic dependence, and the outbreak of the first world war deteriorated the economy and increased foreign intervention. This is especially shown in two ill-fated international agreements: the 1907 Anglo-Russian agreement which was to divide Iran into spheres of influence and the 1919 Anglo-Iranian agreement which was to practise a tight control over the country.

The impact of these periods of political and economic instability was a stagnation of urban development. Nevertheless, the demand for reform, which characterized this period, was so that the incoming change of political structure was forced to undertake another major programme for the transformation of the city.

4.1.3. Reza Shah 1925-1941

The first world war and its associated events put forward new circumstances. These were the advent of socialist revolution in Russia, which renounced all the previous economic claims, and the post-war financial difficulties of British empire, which prevented direct intervention (Olson, 1980). An atmosphere was created in which the integrative nationalism (Abrahamian, 1980), which had started to develop since 1890 (Cottam, 1964), could grow. What was required for a full transition into capitalist
development was the destruction of feudal dispersion and the surviving medieval partition, which had proved to be difficult in the hands of the Qajar feudal aristocracy (Abdullaev, in Issawi, 1971). The change of dynasty from Qajar to Pahlavi (1925-1979), which followed the 1921 coup by Reza Khan, highlights this focal point.

The immediate task of Reza Shah was centralization of government and consolidation of his power, which were carried out by the creation of a new army, a reorganized government bureaucracy, and a court patronage (Abrahamian, 1982:136-7). Whereas the court turned into a wealthy landed military complex, the former two provided the basis for the growth of an urban middle class living in the capital and the large cities.

The drive for the increase in the power of government had adverse implications for the political and social freedoms achieved by the Constitutional Revolution. The elections of the national assembly were manipulated, opposition parties, religious leaders, radical and liberal movements persecuted and suppressed. The 1920s and 1930s saw the increasing intervention of the state in economic affairs. It established monopolies on many goods and tried to take full control of the foreign trade.

Serious efforts were made to improve communication. The first major railway in the country, Trans-Iranian Railway was constructed which linked the Persian Gulf to the Caspian Sea. The tolls and road taxes were abolished and, under a road development plan, 14,000 miles of new roads were built by the end of the 1930s. Together with the rapid import of vehicles, up to the annual average of 3,000 in the mid 1930s, the travel times were cut and the inland freight rates fell (Bharier, 1971).

The improvement of communications linked the regions and opened up the country for the internal trade and movement of imports. The military mobility was increased so that the regional movements and power structures were suppressed and the strength and dominance of the central government established. The transportation network enabled the nationalist government to try to integrate the diverse communities into a unified nation and overcome the existing factionalism.

Likewise, a network of transportation with similar aims was established in Tehran: to ease the military movement throughout the city to support the increasing strength of the government; to change the city into an open matrix for an easy movement of goods and capital; and to overcome the existing feudal factionalism by linking the separate
living quarters and imposing a framework on them, a unified space to encourage homogenization.

Despite the fact that the commodification of urban space had started with the first transformation of the city, it was the second transformation which opened up the whole fabric to extend the capitalist production system into the urban space and set the pattern for future. The massive scale of urban development in this phase, which extended its scope to transform the urban fabric in a radical way, distinguishes it from the previous phase. It served to absorb the surpluses of capital and labour which had resulted from political and economic reorganization. It also built the foundations of a new land and property market which was to flourish especially in the period of the relaxation of controls after the second world war. By imposing a new road system, wide, tree lined streets intersecting at right angles, upon the old urban fabric, it modified the urban space in accordance with the higher demands for mobility.

The improvement of transport led also to the relative prevention of local famines and, consequently, the rate of population growth rose from under 1 per cent to 1.5 per cent. The proportion of urban population, however, remained static, at about 20 per cent, for the first one-third of the century. It was in the mid 1930s that, as a result of intensified rural-urban migration, the annual rate of population growth in urban areas reached 2.30 per cent as compared to 1.30 per cent in rural areas (Bharier, 1971:23-8).

Centralization of administration, expansion of bureaucracy, and the primary attention being given to the cities gave a primacy to the capital city where, by 1940, 58.5 per cent of all domestic capital investment was made (Keddie, 1981:102). In Tehran, population grew from 200,000 in 1920 to about 700,000 in 1941 (VBB, 1987a).

The state paid no or little attention to the agricultural sector which employed the great majority of the work force and whose products were sufficient to meet the domestic needs. The importance of the agricultural sector in the country's economy, which contributed 80-90 per cent of the GNP at the turn of the century, reduced to about 50 per cent by 1950. Despite changes in the type of crops, for example curbing the production of opium and increasing tea and sugar, the structure of agricultural production remained basically unaltered (Bharier, 1971). The attempts which were made to change the land tenure system resulted in the acquisition of vast areas by the shah or large landlords, reducing the peasant ownership of land to minimum (Issawi, 1971; Keddie, 1981).
As against the neglect of agriculture, a major move was made towards industrialization. By the end of the 1930s, 20 per cent of the general budget was allocated to industry. By 1947, the contribution of industrial sector to the GNP rose to about 5 per cent (Bharier, 1971). The government was envisaged as a prime mover and private enterprise was encouraged by import duty protection, industrial credits, and facilities for the importation of productive equipment. By 1950, the public sector covered 15 per cent of the enterprises employing 32.5 per cent of the total number of workers, the rest covered by the private sector (Grunwald & Ronall, 1975).

With the main stress being put on the large industries, especially sugar, textiles, glass, matches, and cement, the small industries which were involved in simple processing of agricultural products apparently suffered. The number of these, which had proliferated earlier in the large cities, had reached 5,000 in Tehran by 1928, employing 15,000 workers, before their decline in the next decade (Bharier, 1971).

The number of industrial concerns increased from 38 in 1931 to 635 in 1945, of which 378 were concentrated in Tehran (Grunwald & Ronall, 1975), this centre of decision making and the largest market of the country. Most of the concerns were situated in the south city where gradually was finding the character of an industrial zone. This was accentuated by accommodating the living places of the newly born industrial working class in this area. In this way, the capitalist industrialization and the new classes which created were finding geographical expression. It sustained and accelerated the basic polarization of the city structure which had started in the first reform.

Foreign trade expanded and new foreign partners, USA and later Germany, were sought to balance the power between the old rivals (Knapp, 1977). The withdrawal of the government from its attempt to nationalize foreign trade proved the strength of the merchants. In this period, the merchant capital, which had strong Western ties, continued to be the dominant form of capital (Keddie, 1981). However, excluding the oil exports, the foreign trade still showed a regular deficit. When the increasing oil revenue included, deficit ceased after 1921 (Bharier, 1971).

The oil industry, which developed in enclave, was run by the Anglo-Persian Oil Company, which was based on a concession obtained by W.D'Arcy for sixty years exploration, exploitation, and export. The royalty it paid to the government, 16 per cent of the profit, formed only 10 per cent of the country's general budget in the mid-
1920s. After the 1933 agreement, which followed the cancellation of the concession by the government in 1932, the royalty increased and the proportion of the oil revenue in the budget increased to about 25 per cent by the end of the decade (Bharier, 1971).

Reza Shah implemented reforms which had remained ill-fated in the previous century. For him, as for many reformers in the late nineteenth century, modernization was associated with Westernization, his long-range goal being "to rebuild Iran in the image of the West" (Abrahamian, 1982:140).

Some of these reforms were far reaching, such as secularization of educational and judicial systems, reorganization of military and administration, and introduction of new financial and fiscal structures. Others, however, remained superficial, as exemplified by the forceful replacing of traditional ethnic and religious clothes with European-style dress in 1928 (Abrahamian, 1982). The new streets and squares, with the rulers' statues, were other examples of reform in appearance in which Western morphologies were preferred to, and, by force, became substitute for, the existing ones.

His ambition was to transform a multi-ethnic empire into a unified nation state. The past was associated with administrative inefficiency, tribal anarchy, clerical authority, and social heterogeneity. This was to be replaced by a future marked by cultural uniformity, political conformity, and ethnic homogeneity (Abrahamian, 1982:140-49). It was partly for breaking down the existing social structure, its communal heterogeneity housed in a quarter system, that a network of new streets were laid out to cut across many urban areas (Clarke & Clark, 1969; English, 1966; Clarke, 1963), including the all important capital city. Factionalism which was identified with the segregated urban quarters was thus to be overcome by imposing a framework on the fabric to create physical, as well as social, homogeneity.

4.1.4. Post-war Period

4.1.4.1. 1941-1953

The outbreak of the second world war and the occupation of Iran by the Allies in 1941 led to the abdication of Reza Shah, who had developed close ties with Germany in his latter years of rule, in favour of his son Muhammad Reza. The relaxation of political suppression gave rise to a revival of free press, trade unions, and rival political parties, which lasted for twelve years.
Chapter Four

The presence of the Allied forces had an enormous impact on the distribution of supply, which led to famine in some areas, and to an increasing inflation in others. The cost-of-living index rose from 100 in 1939 to 757 in 1944 (Keddie, 1981:116). This was beneficial for those middle and upper classes who dealt with goods or credit, and detrimental to lower classes and those on fixed incomes. The new circumstances hit the government revenue and caused the deterioration of industries.

Many of the forcefully settled nomadic tribes began to move again. Large numbers of peasants, impoverished by debt and inflation and high interest rates as well as the rising power of landlords, heavily represented in the government, and new private landowners, migrated to the cities and towns. They constituted urban unemployed and growing working class employed in railways, construction, oil industry, the growing private sector industries, and the newly privatized state factories.

The demands of the Allied forces for urban goods and services, expansion of professions, and continued growth of the army, gendarmerie, and bureaucracy stimulated urbanization. This was followed by a boom in residential buildings especially between 1945-9 (Bharier, 1971) as well as a growing density in the cities. By 1951, the urban population increased to 4.9 million or 30.4 per cent of the total population. Within a decade, Tehran’s population doubled to pass the level of one million (VBB, 1987a).

The residential boom was the first of successive waves of speculative land and property development which has featured the post-war production of urban fabric in Tehran. It was a direct result of the bases founded in the two stages of transformation which had incorporated the production of space into the emerging capitalist mode of production.

This period ended with the nationalization of the oil industry by Mossadegh’s nationalist government in 1951. It led to an international economic blockade of the country and finally the collapse of the government in 1953 by an American supported coup d’etat in favour of the shah to safeguard the exportation of oil.

4.1.4.2. 1953-63

The post-war period marked the beginning of an era in which a new rivalry between the great powers, between the United States and Soviet Union dominated the foreign relations of Iran. The 1953 coup was a focal point in which the United States, whose
influence had grown since the war through economic advisers and military missions and aids, became the dominant foreign power in Iran. The decade which followed witnessed the consolidation of the shah’s power through suppression of the opposition, firm control of elections, setting up a secret police, and expansion of armed forces. The foundations of a royal dictatorship were laid which was to last for twenty five years.

In 1954, a new oil concession was granted on the basis of 50-50 profit sharing between the government of Iran and a consortium of major European and American oil companies. The share of the latter rose to constitute 40 per cent, to be equal to that of the Anglo-Iranian Oil Company which was renamed British Petroleum. As a result of the new agreement, the oil revenue increased from $20.7 million in 1954 to $90.2 million in 1955 and to $380 million in 1963 (Razzaghi, 1988:454-8,485).

From the mid-1950s, the state started an industrialization drive whose basic policy was to encourage private investment, both domestic and foreign, for developing import-substitute industries. There were no stress on export-promotion or considerations of employment in these modern capital-intensive industries. Also no relationship between these and the agricultural sector was envisaged.

As a result, manufacturing industries grew significantly, with an increase in the number of industrial enterprises and the production indices of most of Iran’s major commodities. Most of the plants, however, were located in Tehran and its environs so that, in 1960, this area accounted for 30 per cent of all new establishments (Bharier,1971:185-9). In 1956, the population of Tehran had risen to 1.56 million, constituting 26.2 per cent of the urban population (VBB,1987a). In this year, 20.1 per cent of the workforce were employed by industry, as compared to the 56.3 per cent in agriculture and 23.6 in services (Razzaghi,1988:117).

The rise in oil revenue and the increasing rate of population growth and immigration to cities led to a further expansion of the capital city. In the 1950s, speculative development, which had been started in the early post-war years, found even larger scales. The rising numbers of cars and buses allowed the urban fabric to spread freely throughout the surrounding countryside.

To finance the escalating military expenditure and the ambitious development plans, the government had to rely on heavy borrowing from abroad. The conditions of the International Monetary Fund to protect the value of currency and pressure from the
Kennedy administration to carry out liberal reforms destabilized the regime (Bharier, 1971; Abrahamian, 1982). Consequently, the period between 1960 to 1963 saw an economic crisis, a degree of political freedom, the beginning of a major land reform, and a popular revolt which was a rehearsal for a revolution fifteen years later.

4.1.4.3. 1963-77

This period is seen as a major step towards the capitalist way of development by removing the pre-capitalist barriers to it and attempting to strengthen a weak private sector. This was carried out by the state whose autocratic nature and whose monopoly control of the ever increasing oil revenue tended to create a state capitalism (Keddie, 1981:160).

The land reform of 1962, whose three phases were officially completed by 1971, has been seen as the intervention of the state to encourage the capitalist transformation of the Iranian countryside (Halliday, 1979). By then, about 70 per cent of the fertile agricultural land was owned or controlled by a small number of absentee large landowners and was cultivated on the basis of the small holdings of crop-sharing peasants (Bharier, 1971). In the land reform programme, this system of ownership and production, which was seen as a bar to both development and the central government control of the countryside, was largely dismantled.

According to the reform, large landowners had to sell, or lease, their agricultural property, in excess of a certain amount, through the state, to the share-cropping peasants who worked on the same land and had some cultivating rights. However, this programme did not include the rural wage earners, about 40 per cent of the cultivating villagers (Keddie, 1981). Also the nationalization of pasture took away the tribal control of pastureland and, subsequently, the nomads, being deprived of their livelihood, were forced to settle. Instead, from the late 1960s, the government economic and technical aid and encouragement favoured a small number of large agricultural units, farm cooperatives, and agri-businesses run by domestic and multinational corporations.

The process of land reform encouraged the old magnates to be incorporated more into urban and rural bourgeoisie. Its unequal distribution created a rural bourgeoisie and also gave impetus to those who had received insufficient or no land to migrate to the cities. The percentage of employment in primary sector fell to 46.2 per cent in 1966 and to 34 in 1976. The number of nomadic tribes reduced to only one per cent of the
population (or 7 per cent according to definition). Migration to cities increased so that, between 1966 and 1976, the population of the 20 largest cities grew 67 per cent. (Razzaghi, 1988:69-126).

By undermining the old magnates, a power vacuum was created in which the political support by, and the total control of, the countryside was taken by the state. However, it proved to be an economic failure. An increase in production took place which was the result of an increase in area of cultivation (Bharier, 1971). However, the rate of increase of agricultural production was below the rate of increase of population and far below the rising demand for consumption stimulated by the oil revenue, which led to an ever increasing rise in the import of food (Halliday, 1979:127). The contribution of agriculture sector to GNP declined once again, from 33 per cent in 1959 to only 25 per cent in the late 1960s (Bharier, 1971).

Oil revenues increased as a result of the re-negotiation of the 1954 agreement with the international consortium and the dramatic price rise of 1973. It rose from $482 million in 1964 to about $20.7 billion in 1977 (Razzaghi, 1988:485).

An effect of the boom was an increase in the dependency of the economy on oil and, through it, on the advanced industrialized countries of the West. The oil contribution rose from 17 per cent of GNP in 1967-8 to 38 per cent in 1977-8, and accounted for 77 per cent of government revenue and 87 per cent of foreign exchange earnings in 1977 (Halliday, 1979:138-9).

From the mid-1960s a major industrial growth, at an average annual rate of 15 per cent until 1975, was carried out. Development plans concentrated on producing consumer goods for the internal market and encouraging the growth of basic and intermediary industries. By 1977, there were 250,000 manufacturing establishments, of which 6,000 were employing ten or more, with a total employment of an estimated 2.5 million people (Halliday, 1979:148). From 1966, the proportion of employment in industry rose from 27.1 to 34.2 per cent (Razzaghi, 1988:117). The share of manufacturing in GNP rose to 17 per cent in 1977 (Abrahamian, 1982:430).

Unemployment rose gradually to 10.2 per cent in 1976. The number of the employers, which had grown from 1.16 per cent in 1956 to 2.9 in 1971, fell to 2.1 in 1976 due to the accumulation of capital in fewer hands and expansion of monopolization. During this period, the urban-based employers grew from 51.5 to 78 per cent. Along with
rural-urban migration, other forms of employment also increased in favour of the cities. The proportion of self-employed, i.e., independent workers without employees, fell from 43.2 per cent in 1956 to 32 per cent in 1976. The number of employees grew from 44.3 per cent in 1956 to 54 per cent in 1976. In this period, there was a fall in private sector employment, from 36.9 per cent to 34.9, and a dramatic increase in public sector employment, from 7.9 to 19 per cent (Razzaghi, 1988: 110-11).

As a result of investment in health care facilities, most of them concentrated in cities, the number of population grew, from 25.8 million in 1966 to 33.7 million in 1976, the urbanized population from 39.1 per cent to 47.1 per cent. In this period, Tehran grew from 2.98 million to 4.59 million (Razzaghi, 1988; VBB, 1987a).

Tehran became the largest concentration of economic enterprises as well as the largest market in the country. It extracted money and people from all around the country, creating large surpluses of capital and labour which needed to be absorbed, increasingly by being channelled into the built environment. In the mid-1970s Tehran accounted for 72 per cent of migration between provinces and 44 per cent of that between urban areas. It accommodated 13.3 per cent of the whole population and 28.6 per cent of urban population, producing half the GNP (excluding oil revenue). 40 per cent of all the national investments and 60 per cent of industrial investments were made in Tehran which housed 40 per cent of large industrial concerns, 40 per cent employment in retail and 60 per cent in wholesale activities. 35 per cent of the banks with 75 per cent of deposits, and 41 per cent of insurance companies were concentrated in Tehran. 84 per cent of housing loans were allocated in the capital whose share of all construction investments was 47.2 per cent. Tehran was also a concentration of 56.8 per cent of all hospital beds, 57 per cent of physicians, and 55 per cent of students. 57 per cent of university graduation, 64.1 per cent of newspaper distribution, and 68 per cent of vehicle registrations were made in Tehran (ST, 1978).

The urban fabric of Tehran grew faster than ever. During the period 1967-1980, the number of dwellings grew two and a half times. The new developments, supported by the oil boom of the 1970s, were built in different forms, from low rise to high rise and from single developments to large new towns, all constituting a complex and ever expanding combination.

The fact that the state was the recipient of oil income, i.e., the major source of funds, and, accordingly, the major distributor of it, gave the state a far reaching place in the
economy, somewhat similar to other oil economies (Gilbert & Healey, 1985). It also, together with support from its international allies, allowed the state to practise an utmost degree of political control over the population (Halliday, 1979).

Despite the dramatic growth of GNP, from about US$200 per capita in the early 1960s to about US$1,000 in real terms in the late 1970s, the income gap widened due to the government policies (Keddie, 1981). The large and increasing disparities by region and class are reflected in the patterns of consumption and income. Whereas 32.5 per cent of the total consumption was accounted for by the highest 10 per cent of families in income scale, only 2.5 per cent was accounted for by the lowest 10 per cent. The divide between classes and between urban and rural areas is shown in the wide discrepancy between the income of the upper-level urban households and other households, a ratio of 6:1 on a per capita basis for lower urban households, and 11:1 for rural households. The capital city accommodated most of the higher income households. Per capita income in Tehran was 45 per cent higher than in other large cities and 70 per cent higher than in small towns (Looney, 1975:3). It was the deterioration of income distribution and the widening social divide that was a major contributing factor to the widespread discontents of the late 1970s (Looney, 1982).

Four classes are identified as forming the urban population of Iran by the mid-1970s (Abrahamian, 1982). An upper class of not more than one thousand individuals included royal and aristocratic families and entrepreneurs. They not only owned many of the large commercial farms but also some 85 per cent of major private firms involved in banking, manufacturing, foreign trade, insurance, and urban construction.

The propertied middle class, with bazaar community at its core and urban entrepreneurs and clergy at its sides, constituted a traditional force which had preserved much of its power. Half of the country's handicraft production, two thirds of its retail trade, and three quarters of its wholesale trade were controlled by the bazaars.

The salaried middle class, whose number had doubled within twenty years, included civil servants, teachers and school administrators, engineers, managers, and white-collar workers. The working class, including rural and industrial wage earners, together with the impoverished urban poor, constituted 34 per cent of the labour force by the mid-1970s, as compared to 16 per cent in the 1940s.
In Tehran, these different social classes found spatial arrangements based on, and enhancing, the north-south divide. This structural characteristic of Tehran’s urban form, which was rooted in the first transformation of the urban fabric, was enhanced. Variations within this duality, however, occurred according to the ethnic and cultural varieties of the social structure.

The period 1963-1977 saw a socio-economic development and a deliberate underdevelopment of the political system (Abrahamian, 1982:427). The gulf between the two became so wide that an economic crisis, resulting from a fall in oil revenue, was able to urge a revolution which dismantled the whole political apparatus and shook the socio-economic structure. Once again, like in the revolution of 1906, the authoritarian regime was swept aside by a class alliance which saw it as an obstacle to political development and unable to cope with the complexities of socio-economic development (Graham, 1979).

In the 1970s, the Iranian state was characterized as being a royal dictatorship, dependent on the support from the advanced capitalist countries, which was promoting the growth of capitalist social relations and the expansion of productive forces along capitalist lines (Halliday, 1979:38-65). The form of this dictatorship was, however, unique in that it "combined the vigourous promotion of capitalist development with a fully constituted monarchist regime" (ibid:56), a fundamentally anti-capitalist form of political structure.

4.1.4.4. The Islamic Revolution 1977-79

The revolution which established the Islamic Republic in 1979, aimed at resuming the political, economic, and cultural independence, which was eroded through further integration of the country into the world market. This was to be gained through reducing the dependence on oil revenue, giving priority to agriculture, encouraging the rural economy to prevent further urbanization, democratizing the political arena, decentralizing the administrative system, and reducing the class divide. Nationalization of banks and large companies accompanied the revolutionary government’s preference for small scale private enterprise.

However, the war which was imposed on Iran in the aftermath of the revolution has had disastrous social and economic effects, as best depicted by the Amendment to the First Development Plan of Islamic Republic of Iran (VBB, 1987b). It recounts an increased rate of population growth, 3.1 per cent annually as against 2.7 in the late 1970s, which,
without respective expansion of economy, has led to impoverishment of large sections of population. The problems which the country is facing include lack of new investments in agriculture and industry, deterioration of infrastructures, inflation, increased dependency upon oil revenue, budget deficit, and various administrative, legal, and executive obstacles. The declining oil revenue has been spent on imports of consumer products, raw, intermediary, and capital goods for assemblage industries, skilled workers, and modern technology. Low productivity, under-utilization of industrial capacity, and unemployment of 19 percent are among other problems. Even though a reduction in the class divide has occurred, 10 million people are identified as confronting substantial deprivation. As against them are about 100,000 households who control much of the surplus through trade and speculation.

The private sector has grown to the extent that it controls a turnover three times the size of annual governmental budget. During the 1976-1986, service sector expanded considerably to account for 45.4 percent of employment. As compared to that, there has been stagnation or decline in agriculture, whose share fell from 34 to 29.1 percent, and in industry, from 34.2 to 25.5 percent (Razzaghi, 1988:111-17).

Economic instability, relaxation of political authority, and the continuation of a centralized administrative system stimulated urbanization further to increase the total urban population to 26.9 million or 54.4 percent in 1986. In 1982, 25 percent of urban population lived in one city, Tehran, or 45 percent in six cities, or 66.5 percent in 33 cities of 100,000 inhabitants and more. In the same year, the density of Tehran province was 15 times that of the national average and 107 times that of Semnan province (Razzaghi, 1988:92).

In 1986, the population of Tehran increased to 6.02 million (MAI, 1987a). Even though the proportion of its population to the total urban population had started to gradually decline from the 1960s, from 30.4 percent in 1966 to 23.2 in 1986, its suburbs grew very rapidly. Between 1976 and 1982, suburban cities of Karaj and Islam-Shahr were the fastest growing cities of Iran with annual growth rates of 16.7 and 13.9 percent respectively (Razzaghi, 1988:93). In 1986, with its suburbs, Tehran formed an urban region of nearly 8 million inhabitants or about 30 percent of the country's urban population. Only within the space of a decade, 1976-86, this urban region has gained 3 million more population. By the year 2010, it is expected to have a population of 15 to 27 million (Hesamian, 1987; VBB, 1987a).
The impact of a further increase in the population of Tehran on its urban form has been more or less similar to the previous periods: a further outward expansion of the urban fabric, especially in the south beyond the municipal service boundaries. The relaxation of political control and the decline of the economy have not been helping the government in its fight against the uneven social and urban structure, hence the north-south divide remaining largely intact.

4.2. Cultural Challenge and Response

During the last one hundred and fifty years, the political and economic contact of the country with the West has found a dual response in the Iranian society, as best reflected in two distinctive strata: modern intelligentsia and traditional middle classes (Abrahamian, 1982). These formed both nationalist movements opposing to foreign political interference and economic dominance, and to the country’s rulers whom they saw as responsible for its humiliating effects. The two forces usually confronted each other, which could reach its peak during the periods of political freedom such as the 1940s (Young, 1948). However, at two instances in the recent history of Iran, these two groups formed alliances, which both led to the advent of revolutions in 1906 and 1979.

The modern intelligentsia were those intellectuals who, through travels, translations, and new educational establishments, had adopted modern ideas, aspirations and values along Western lines. Initially, they came from different strata, from aristocracy as well as from the bazaar, and were too few to form a social class. In the twentieth century, however, resulting mainly from the expansion of bureaucracy and army, they developed into a salaried middle class (Abrahamian, 1982).

The constituent parts of the traditional middle classes were the clergy and the bazaar community of merchants and artisans who, before the impact of the West, practised a large degree of control over economic and social affairs. These traditional privileges of this group were lost through the establishment of new economic orders with predominance of foreign interests and their associates, and through secularization of the society by the government. Integration of the country into the world economy turned this group into a propertied middle class.

The modern intelligentsia, who gained the upper hand in the first revolution, believed that, to break the chains of royal despotism, clerical dogmatism, and foreign imperialism, the solutions were liberalism, secularism, and nationalism. They argued...
that, for having a modern, strong, and developed Iran, a radical transformation of society was required. To pave the way for a capitalist development, the country needed to be restructured in the image of the materialized example of industrial development, the West.

As against this approach was that of the traditional middle classes, who gained the upper hand in the second revolution. They believed in a nationalism in which the political and economic independence of the country was sought through a return to the traditional values, as idealized in Islamic culture of the society, and through least possible contact with the Western forces and values.

Against this background, it is not surprising that the two phases of restructuring of Tehran were encouraged, or carried out, by the modern intelligentsia as a part of the process of recreation of society in a new image. The outcome of this transformation of society was sought to have no relationship with its predecessors, as traditions and everything associated with them were thought to indicate backwardness.

This sharp break with the past meant that the new forms, of urban fabric as well as of economic activities and social norms, could not develop out of the existing ones. The latter were totally disregarded and a process of heavy borrowing from the West started. The new institutions and structures which were imported, therefore, were imposed on or juxtaposed to the existing ones, creating an uneasy coexistence of sometimes antagonistic entities.

Unlike many other countries of the Third World, these new forms were not directly introduced by foreigners, since Iran was never colonized. Instead, the agent of transformation was here the group who came to existence as a result of contacts with those powers. However, like many other colonized countries, the imposition of new institutions led to a crisis of cultural identity, and was partly instrumental in economic failure and political break down.

Nevertheless, the coexistence of the new and old institutions resulted in the apparently permanent establishment of the former and the relative disappearance of the latter. This was made possible by the direct intervention of the state in the creation and support of new institutions for most of the present century. It was also supported by the apparent success of the similar forms of institutions elsewhere, especially in the West. Urban form, especially in Tehran, whose transformation pre-dates other Iranian
cities and whose old parts are proportionately smaller, appears to be the product of, and a contributor to, these new institutions.

The coexistence and duality of the old and new, of two modes of production and two cultures, found spatial manifestation in numerous aspects. The most obvious one was the rivalry of two city centres: a new city centre to the north of the old one. Whereas the new centre, housed in the new urban space, was encouraged by the state as a sign of modernity, the old centre, with the bazaar as its focus, was undermined and threatened to destruction. The outcome was hoped to be a unity and homogeneity of urban space. Nevertheless, as in many other cases, this threat did not verified, leading to the coexistence of old and new.

4.3. Instrumental versus Social Rationality

Within the social homogeneity encouraged by the state was developing an individualism associated with the development of capitalist social relations. It was a process in which the communal bonds were destroyed to be replaced by relationships defined by the access of individuals to money. Old communities started to be replaced with the community of money (Harvey, 1989).

This implied the emergence of a new rationality: that which urges individuals to undermine the previous bonds of social rationality in favour of personal gains. The communal bonds included various religious, ethnic, and cultural relations which had developed over long periods of time and linked a group of individuals together. Conforming to these relations and the norms which based on them constituted a form of social rationality for individual actions. The social rationality was in close relationship with the environmental rationality, as already discussed in the previous chapter. Therefore, before the dramatic transformations since the nineteenth century, the basis of a rational action, including the production of the urban fabric, was to take into consideration these dual rationalities.

During the process of societal transformations, there was a search for profit, or possessive individualism so much a major characteristic of capitalism, which was replacing the environmental rationality, both social and physical, of the earlier times. The new built fabric, as most other aspects incorporated into the capitalist relationships, was increasingly subject to this new code of action.
This, however, did not mean that no form of social rationality has been at work ever since these societal transformations. On the one hand, during the transformation period, a new set of social and cultural bonds were created which established the platforms of a new, socially rational behaviour. These were either enforced by the government through laws and regulations or spread informally along with the gradual integration of the country into the West-dominated world system. Although the advent of the Islamic revolution has shown that the rationality of the new social and cultural norms has been less deep-rooted and so less resistant to changes, a large number of these new norms continue to be valued. On the other hand, many of the old social and cultural, among them especially religious, patterns showed resilience. Although these were increasingly undermined in a coexistence of different forms of rationality in which the newer forms have been gaining ground, the Islamic revolution has proved how the old forms can survive and exert a powerful influence on social processes.

It might be argued that what has occurred is the change of social norms and not of the essence of social rationality because in any social circumstance there will exist a form of social rationality. This rationality would be simply meaning that individuals always have to show some form of conformity to their social environment. Although this argument is essentially true, it should be noted that the degree of this conformity is of crucial importance in a social environment. It is at this point that the concept of competing rationalities, as introduced earlier finds ground.

The concept of competing rationalities argues that the degree of the social rationality, as a major social norm in human conduct, has changed dramatically along with a change in the instrumental rationality. In the transformation of the Iranian society, there has been an adverse relationship between these two rationalities. In an increasingly capitalist economy and society, the personal gain, especially economic gain as a clue to other material gains, has established the foundation of a new instrumental rationality according to which most of the social codes have been adjusted. Although the drive for personal gain is as old as human beings, it appears that at no time throughout history it has been so predominant in social relationships, as before it was mostly controlled by some form of social bonds.

The impact of the competing rationalities on urban form has been very important. The physical development process, as a social process, was one in which the individual development agencies had to operate within a set of social rules and ideas as evolved over long periods of time. The strength of these rules and ideas ensured that the
personal action, and subsequently the form of the produced fabric, conformed to what the community saw as acceptable. The community was all present in the development of an urban development project. As against this, the personal profit seeking, which became the motivator of the speculative developments of the modern period, undermined this presence, resulting in a built environment full of disorders, conflicts, and inequalities.

4.4. Conclusion

The main feature of economic, political, and social contexts in which Tehran's urban fabric was produced was a fundamental, all embracing change. The historic developments in Iran from the nineteenth century show a dramatic change from a feudal, or pre-capitalist social formation to a capitalist one (Halliday, 1979; Razzaghi, 1988). Nevertheless, the second most important feature of these contexts is the conflict which has stemmed from the pressures of the incoming system and the resistance of the outgoing one, resulting in a duality coupled with the polarization which the capitalist system created.

Economically, the restructuring of agriculture in the nineteenth century and the increasing oil revenue in the twentieth have integrated Iran's economy firmly into the world market. From a closed, self-reliant economy, it changed into one based on the export of raw materials and import of manufactured goods, technology, and increasingly foodstuff.

Through commodification of agricultural produce, land and labour became market commodities. The restructuring of agriculture to enter the world market and the land reform were the major processes through which old structures were broken to free capital and labour to concentrate in urban areas. This was eased by the improvement of communication and development of regional and national markets. With an increasing oil revenue and population, the surplus of capital and labour was to be absorbed by expansion of industry. This was a task whose failure led to the service sector growth.

Politically, the international challenge which launched the imposition of a new economic structure upon the country was to remain a vital element in safeguarding Iran's position in the world market. As a scene of rivalry between, and sometimes collaboration of, the great powers of the time, Iran witnessed occupations, coups d'état, and aggressive international agreements.
Internally, the political process has been one of centralization. To overcome the feudal economic and political disintegration, and in response to an international challenge to the state’s authority, a move towards centralization started from the second half of the nineteenth century which has continued to expand the government’s authority ever since. This has been reflected in a change of dynasty and two coups d’etat as well as numerous smaller regional conflicts. The strength of the government, supported by its increasing monopolization of the oil revenue, implied that it could intervene to foster social and economic change with actions such as land reform, industrialization drives, and improvement in transport and communication. Contradictory to this process of centralization has been the struggle for individual freedom which accompanies the money economy. The outcome of this struggle has been reflected in two revolutions and numerous protest movements.

Socially, the parochialist, communal structure of society was dismantled to be replaced by one in which the relationships were to be defined by individuals’ access to money. It was at once a drive for homogeneity of population, in which loyalty to the nation substituted for loyalty to the community, and a drive for polarization, which stemmed from the uneven access to money.

These developments have been directly or indirectly reflected in space. The process of commodification and concentration of capital and labour and the concentration of political authority led to the expansion of urban areas. Some of the surplus of this concentration was to be invested in the production of built environment, which extended the process of commodification to the production of space, and itself intensified the process of concentration of capital and labour in urban areas. The former patterns of space were to be adjusted to this new concentration by the increasingly centralized state. The parochialist quarter systems and, to a lesser extent, regional hierarchies were replaced by a unified, homogeneous space which would allow the easy flow of the incoming resources. This would provide an open matrix in which the process of social stratification could take place according to new economic circumstances. The social divide which was associated with the new circumstances, however, created a spatial divide. At the head of this new, increasingly uneven spatial system stood the capital city whose urban space was the manifestation of an intra-urban concentration within an inter-urban concentration. The failure of the process of industrialization, the blight of agriculture, and the growth of services and increasing
reliance on oil revenue lay the foundations of the creation of a landscape of consumption.
So far, the study has produced an analytical description of the form of Tehran's urban fabric and a survey of the physical and social contexts in which this fabric has been built. In doing so, the foundations of the research, according to the developed methodology, have been laid. It is now time to focus on the development process, that course of action through which urban fabric is being produced, starting with the agencies involved in this process.

In its attempt to study the development agencies in Iran, this chapter starts with a discussion about the relationship of development agencies with the contexts and with each other. It then moves to identify the development agencies, in both public and private sectors, and their impact on urban form. These impacts are briefly referred to in this chapter, to be supplemented in the next two chapters which will focus, at more detailed levels, on the operations of the development agencies and their interactions with development factors. It is expected to result in a general conclusion as to the way urban fabric has been formed through the processes of production and the determinants of the form.

As mentioned earlier, in this and the following chapters, the study of the development process will be carried out at a general, citywide level. Nevertheless, the sample quarters of Chapter Two will be referred to when appropriate. It should also be mentioned that the main source of information for this chapter, in absence of documented materials, is direct observation and experience of the author.

5.1. Development Agencies and the Contexts

The relationship of the development agencies and the contexts in which they operate is a double sided one. The contexts are created, or affected, by a wide range of human agencies, among them those involved in development. At the same time, these contexts frame the activities of individual agents. The relationship of the agencies with these contexts should be seen through development factors, those structural properties of the social and physical contexts, which are more specifically related to, and used as an instrument in, physical development processes.

The development agencies might be classified according to their purpose of development and to their relationship with the factors of development. Therefore, their links with their contexts, which include interrelationships between the agencies, might
be observed through encouragements and constraints about these purposes and relationships.

As regards the purpose, they fall into the public and private categories where the latter's purpose is to seek self-interest from a development, as distinct from the former which is supposedly in charge of the public interest. However, the public development agencies, in line with the government policies, have been traditionally involved in the promotion of the private sector. The outcome has been the predominance of the instrumental rationality with which the private sector operates, i.e., profit-seeking self-interest. This rationality is basically the encouraging mechanism which relates the development agencies with their social and physical contexts. Nevertheless, the involvement of the public sector with the development of infrastructures and public facilities, which tend to de-commodify certain services, puts forward a social rationality which has to be taken into consideration by both sectors. Social rationality, which represents the social and economic interests of large sections of population, introduces different constraints upon the instrumental rationality of the development agencies, hence relating them with their contexts in another way. This form of relationship between the development agencies and their contexts has radically changed since the nineteenth century when, due to the strength of the communal bonds, social rationality had a more far reaching influence upon the agencies and form of development.

These encouragements and constraints are also seen in another set of relationships which the development agencies have with their contexts through what they use as the instruments of production and through the structural dynamics of these instruments. Because of the social and economic change since the nineteenth century which have commodified the space, the relationship of the development agencies with the instruments of production has changed. Now the crucial instrument upon which the main categorization should be made is money, which gives the agency the power to acquire the other instruments and to regulate its relationship with other agencies and the contexts. It, therefore, divides the development agencies into those who invest and those who work, some of whom being in both groups at the same time. This classification puts the public sector with parts of the private sector on one side as the investors, as distinct from the rest of the agencies. Yet the complexities of the organization of the public sector, in which the power to make decisions as regards investment lies within the hands of a minority, renders it difficult to consider the public sector as homogeneous in this respect. Nevertheless, in broad terms, the
relationship of the agents with the resources through the medium of money is the basic criterion which defines their relationship with each other and with their contexts.

Development agencies are divided according to their access to money as an instrument of production. At the same time, different agencies are more or less subject to similar structural constraints exerted by the general credit and money system.

This commodified link may also be traced in the relationship between development agencies and the rules and ideas which constitute other development factors. Simultaneously, there are areas which are either de-commodified, such as certain planning procedures, or are essentially pre-commodified, such as the persistence of the traditional ideas and concepts of space.

In addition to this basic financial link, there are other links which relate the development agencies with each other and with their social and physical environments. These are various networks of relationships whose nature and scope are strongly affected by the extent of the capitalist social relations and the persistence of the pre-capitalist structures. For example, the contractors and subcontractors relate to each other through formal communication channels as well as through shared family, ethnic, and religious background.

The interrelationships are also affected by the size of development and the legal requirements which might restrict the, often public sector, client. In spite of the presence of institutionalized forms of contact, e.g. advertising, the development agencies are often interrelated through personal contacts. It is mostly in the formal, large scale developments by the government which formal channels of contact are being used.

The size of the development agencies, both in terms of capital and organization, is also another criterion to measure interrelationships. Whereas the large private agencies tend to compete with each other, they are more collaborative with smaller scale agencies who, in turn, compete with each other. In other words, whereas the horizontal link is competition, the vertical link tends to be collaboration, a mechanism which enables the agencies to work in some form of division of labour. In spite of this broad sketch, however, there may be found areas in which competition occurs between large and small agencies, especially during the periods of economic recession.
While personal contacts have a critical importance for the interrelationship of the private sector, the public sector with its complex organization has a different, complicated channel of relationship with the context. Important among these channels are policies which tend to regulate the development agencies, their interrelationships, and their instruments. In addition to this regulatory relationship, there are concepts of space, ideas and images which relate the agencies to their context and to other agencies in a freer manner.

5.2. Public Sector Agencies

The outcomes of restructuring of Tehran, in the two phases in the 1870s and 1930s, have been regarded as the "personal creations" of the shahs, the former by Nasser-al-Din (Barthold, 1984), and the latter by Reza Pahlavi (Lockhart, 1960), in the same manner that Esfahan was thought as that of Shah Abbas (Lockhart, 1967). These comments, where the state was personified in the shahs, reflect the popular belief as to how and by whom these developments took place. It was by the shahs' effort and drive that the city was reformed. It is obvious, however, that they were not alone in their attempt and that they shared these ideas and their implementation with some other members of the ruling groups and a large section of the workforce.

The effectiveness of the state might be questioned in respect to these endeavours. It is hard, however, to cast doubt on the primacy of the state in the restructuring of urban form in Tehran. In all phases of urban development, the state has been the only agent large and powerful enough to carry out such considerable tasks. These are best manifest in the promotion of the development by expanding the city walls, in opening up of the urban fabric to a new transportation network, and in devising a planning system to control the development and channel it to the desired paths.

The scope of the public sector has been widening during the recent decades as consistent with the growth of the bureaucracy and the oil revenue. Many activities which were traditionally carried out by the private sector were, especially since the first world war, taken over by the strengthening government. Even the control of the endowment organizations, which had been run by the clergy and were at times important development agencies, was monopolized by the government. At the same time, particularly after the 1953 coup, the growth of private sector has been spectacular, as best reflected in the increasing number of private banks. The revolutionary government, however, through vast nationalization programmes, has
extended even more the scope of the public sector to include the banks, large private companies, and the belongings of the ex-courtiers.

In Iran today, public sector agents are to be found in the executive branch of the state, which is formed of government ministries and, after the revolution, revolutionary organizations. These agencies, through their hierarchy of central and provincial organizations, operate at national and regional levels. Another tier of development agencies are municipalities which are local organizations with limited geographical areas of involvement. Yet another tier are the endowment organizations and revolutionary foundations, which should be seen as semi-public and, according to their size, might operate at local and national levels.

There are four ministries which are directly involved in the production of infrastructures. The Ministry of Roads and Transportation deals with the development of roads, railways, ports, and airports. The Ministry of Energy develops water and electricity, and the Ministry of Post, Telegraph, and Telephone deals with the development of communication systems. The one which is most directly related to urban fabric is the Ministry of Housing and Urban Development (MAI, 1986a). The duties of this Ministry include the provision of comprehensive plans for urban areas; provision of buildings for government’s administrative and housing purposes; control over vacant and public land; and provision of building codes and standards (VMS, 1977).

Other ministries are, however, each in its own special interest, involved in the production of built environment. The structures for military bases, defence industry, administrative buildings, and the servicemen’s housing are developed by the Ministry of Defence. Ministry of Health Care is involved in the development of hospitals, health centres and all related activities. Similarly, Ministry of Education is responsible for the development of schools, Ministry of Higher Education for universities, museums and research centres, and so on.

After the Islamic revolution, new organizations were established in parallel with the existing ministries. The prime object was to foster the process of development with the help of revolutionary organizations which were not stuck within what was thought as a corrupt bureaucratic web. Some other organizations were created by nationalization of certain categories of private properties, such as the royal family belongings. During the
course of the last decade, however, some of these organizations have tended to either become new formal ministries or merge into the existing ones.

The plurality and diversity of these agencies, which at times are engaged in overlapping areas, have led to conflicts between them, hence raising the need for a coordinating mechanism. At its largest scale, this role is meant to be played economically and spatially by the Plan and Budget Organization. In urban areas, the Ministry of Housing and Urban Development, as well as the Ministry of Interior, have been responsible for spatial planning and the municipalities for their implementation. This arrangement proved to be inefficient, especially from its weakest point, i.e., the municipalities with their lack of autonomy and shortage of manpower.

The conflict between public agencies grew especially in the 1970s when the production of space was at its height. For example, the Ministry of Defence, which was called then the Ministry of War, was investing huge sums with almost a free hand. No other authority seemed to have been capable of putting any limit on this process due to the personal interest of the shah in the army.

The impact on urban form of the lack of co-ordination between these powerful agents in the production of built environment should be seen in the disorder which it created, undermining the planning control. Each agency has been pursuing its own projects without an overall interest in the urban structure and form. Combined with the nature of the post-1953 governments, which paid little or no attention to the stark social inequality which their policies had produced, this conflict and disorder could have done nothing but to exacerbate that inequality and its spatial manifestation.

In this light, it becomes partially clear why the location of institutions, whose development was in the hands of the government agencies, have enhanced the unequal structure of Tehran and its north-south divide. The locations of health care facilities, educational institutions, government offices, banks, post offices, libraries and clubs are all somehow biased towards the north and central axis, while government agencies might be expected to be impartial in their location decision.

Some of the ministries have Technical Offices responsible for the design and supervision of the construction process. A few of the ministries, however, are directly involved in the building on site. The main method used by all government ministries is to commission the private sector consultants and contractors for the development of
their required structures. Even the revolutionary organizations which, recruiting large numbers of young volunteers, were initially able and willing to carry out construction works, have turned towards this conventional development procedure.

In this sense, the development agencies in the public sector act more as clients which invest in the production of space by public money. They become the channels through which the earnings of the government from its monopoly over the oil production are transferred into the private hands. The development might be designed by either public or private sectors, but the construction is nearly always carried out by the private sector.

The importance of the public agencies, therefore, lies in their ability in decision making: to initiate a development, to invest in it, to decide for its location, and to have a powerful stake in the form of the development by determining their needs and preferences. The instrument of the public agencies in the development process is this decision making which has taken the form of the planning system and the policies which control the private development agencies, their instruments, their interrelationships, and the development activities of the government departments.

5.3. Private Sector Agencies

The private agencies of development may be classified with the measure of their relationship to the process of commodification of space. There are agencies who develop for use and those who develop for exchange. Whereas the former tend to produce in a pre-commodified way, the latter's production is the prime example of the commodification of space. In other words, the purpose of the agencies from development becomes the criterion against which they can be categorized.

As Chapter Six will show, private investment has been heavily focused on housing, due to its immediate utility and its profit making nature. Development for use has historically constituted the lion’s share of the private investment in housing. Since the rapid socio-economic change, however, the circumstances had started to change in favour of development for exchange. Development for use gradually declined to reach its lowest proportion in 1976, 75 per cent in all urban areas. The rate of decline was higher in Tehran which was the centre of this socio-economic change. In the same year, there was a large gap between the other urban areas and Tehran in which only 53.7 per cent of new dwellings were developed for use (Table 5.1).
### Table 5.1. The Purpose of Development in Completed Dwellings in Urban Areas, 1975-79 (Percentages).

<table>
<thead>
<tr>
<th>Year</th>
<th>Urban Areas</th>
<th>Tehran</th>
<th>Large Cities</th>
<th>Other Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>78.8</td>
<td>54.5</td>
<td>74.5</td>
<td>86.2</td>
</tr>
<tr>
<td>1976</td>
<td>75.0</td>
<td>53.7</td>
<td>70.7</td>
<td>81.3</td>
</tr>
<tr>
<td>1977</td>
<td>76.1</td>
<td>60.3</td>
<td>76.6</td>
<td>80.0</td>
</tr>
<tr>
<td>1978</td>
<td>82.1</td>
<td>85.4</td>
<td>81.1</td>
<td>81.9</td>
</tr>
<tr>
<td>1979</td>
<td>87.0</td>
<td>85.3</td>
<td>86.1</td>
<td>88.7</td>
</tr>
</tbody>
</table>

### Table 5.2. Types of Residential Occupation in Urban Areas 1982-84 (Percentages).

<table>
<thead>
<tr>
<th>Year</th>
<th>Tehran</th>
<th>All Urban Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Owner-occup.</td>
<td>Rent</td>
</tr>
<tr>
<td>1982</td>
<td>62.5</td>
<td>26.3</td>
</tr>
<tr>
<td>1983</td>
<td>63.5</td>
<td>25.1</td>
</tr>
<tr>
<td>1984</td>
<td>64.9</td>
<td>22.8</td>
</tr>
</tbody>
</table>


Sources: MAI, 1986b; 1985.
The statistics show that the dominant form of investment by the private sector has always been made in small scale developments in response to the basic need of building a dwelling for personal use. Nevertheless, it does not imply that the space has not been commodified. The main reason for this argument is that a large proportion of buildings, whatever their initial purpose of development, are ultimately meant for exchange. In an economy where urban land price has always been increasing, one of the most secure forms of investment has been in property. Development for use, therefore, has usually been seen as a form of investment with a high rate of return, higher than saving in the banks or other forms of investment. Another evidence to the commodification of the built environment is the process of commodification of land since the nineteenth century, when agricultural land became alienable and urban development intensified, as will be discussed in the next chapter. At the same time, the large proportion of development for use should be seen as signifying the inability of the construction industry and banking system, among others, to cope with the rapid pace of growing demand for housing.

On the other hand, the expansion of development for exchange, from very low proportions in the beginning of this century reached 46.3 per cent of new private developments in Tehran in 1976, indicating a dramatic change. Apart from the intensified demand for housing as a result of rapid urbanization, it shows a trend towards more specialization in the production process. Subsequently, it is indicative of how a further integration of the economy into the capitalist mode of production has been rendered.

On the demand side, the development for exchange, which was widely encouraged by the government, implies a change in lifestyle towards more mobility and an increasing presence of people who could not afford to become home-owners. The latter point is clear in the growing importance of rent. Even the limited number of years covered in the Table 5.1 show how the proportion of development for rent has been increasing to reach a maximum in 1976, when it starts to decline. The importance of rent is better shown by the statistics from the early 1980s (Table 5.2), that, in spite of its decline after the Islamic revolution, rent still accounted for a quarter of residential occupancy in Tehran urban province, far above the overall rate for all urban areas.

The growing proportion of development for exchange until the mid-1970s has been consistent with the growing availability of finance, increasing size of the firms, and,
ultimately, urban form. It signifies a growing dominance of financiers and producers over consumers. The increasingly available money supplied by oil revenue gave rise to the establishment of large firms which were seeking large profits from large investments. This therefore led to the development of high rise buildings, large housing estates, and new suburban townlets.

The process of capital accumulation through large firms was halted by the advent of the revolution which distrusted these large establishments, which were especially associated with the previous political structure, and aimed at a level of redistribution of wealth. This led to an encouragement of small firms and cooperatives and, as shown in Table 5.2, of home ownership. Also the advent of the war and the following recession in the housing market deteriorated the economic basis of development for exchange. Since the revolution, the development for use has once again grown to reach 93.4 per cent of the new buildings in urban areas of Tehran province (BMI,1986). Only 5.7 per cent have been developed for sale and a mere 0.8 per cent for rent. Even in the case of non-residential buildings, which constituted 1.2 per cent of the new buildings, the development for use in the same year has been 74.5 per cent, sale and rent accounting for 14.5 and 1.6 per cent respectively. Nevertheless, it is worth noting that the legal restrictions on land and property transactions have affected the statistical account, implying that, in reality, there should be a higher rate of production for exchange.

The implications of these two major patterns of production for use and exchange on urban structure and form have been far reaching. The increase in the development for exchange, as signifying the growing patterns of capitalist production, meant a growth in the competition for space. This was a competition eased by the opening up of the urban fabric during the transformation periods. The combination of a unified urban space and the increase in competition led to the major structural characteristics of urban fabric, as observed in Chapter Two, a point which will be expanded in the next chapter.

Also important is the different rationalities with which these two groups operate: "profitability" in the development for exchange or "usability" in the development for use. Traditionally, the former was distinguishable by its lower quality of the product, higher intensity in the use of land, and in its trend towards standardization and monotony. With further development of the production patterns and with the increasing rate of urban development, however, these differences have tended to be minimized. With the escalation of land price and with the further commodification of
land and property, the principle of maximization of floor space in the project is shared between the two groups.

Another important outcome of the growth of development for exchange was a move towards standardization of the built environment, as distinct from the diversity inherent in the development for use. Also contributing to this distinction are the types of development agencies and their organizations, as will be discussed now.

5.3.1. Banks

Although the banks in Iran are now all nationalized, they are here discussed under the general title of private development agencies. This has been mainly due to the considerable rise in private banking in the post-war decades and their important role in the development process. Nevertheless, this does not imply to exclude these institutions from the public sector, especially some major public banks which have been most influential in supporting the private banks and in financing the development industry.

Initially, before the establishment of modern banks in the late nineteenth century, it was the merchants who were dealing with the money lending and credit. Until the 1920s, two foreign banks, which belonged to the two rival British and Russian powers and had been established in 1889 and 1890, dominated the fiscal and financial affairs of the country. The inter-war years witnessed the establishment of a number of Iranian banks, especially Bank Melli Iran (National Bank of Iran) in 1928, which became the core of the banking system with the right to publish money. The duties of this bank was taken over by Bank Markazi Iran (Central Bank of Iran) in 1960.

Until 1952, six banks had been launched of which four were owned by the state. After this period, however, private banks grew considerably. Between 1952 and 1973, 19 new banks were established of which only three were entirely state-owned. The rest were developed by the foreign and Iranian private capital or by their partnership with the state. This process intensified after 1973 so that, by 1977, the number of banks increased to 36, only eight of them owned by the state and one a partnership with private sector. During this period, the turnover of the banks grew sixfold. Foreign capital formed 23.6 per cent of half of the private banks capital, and 40 per cent of the bank which was formed by public and private capital. In 1978, the 36 banks had 8374
branches around the country, 26 per cent of which were concentrated in Tehran. 95 per cent of the branches belonged to commercial banks (Razzaghi, 1988:218-25).

After the large scale capital flight during the revolution and the bankruptcy of the private banks, some of which had provided credit to companies many times the size of their capital, all of the banks were nationalized. Apart from a few, they were aggregated into five major banks devoted to mining and industry, housing, agriculture, and commerce.

The private banks, during their period of rise and fall, were widely involved in crediting both supply and demand sides in building, thus having direct impacts on producers and consumers of built space. Sometimes, as in the case of the sample quarter Shahrak-Qods, a bank, in this case Bank Omran, was itself the development agency. Relying on the vast sums of money it controlled, because it belonged to the royal family, this bank was able to develop an entire new town. After the nationalization, the private banks have continued to have an important impact through the public sector, especially within the framework of the Ministry of Treasury and Economic Affairs.

5.3.2. Financial Institutions

From the mid-1960s, a number of private financial institutions, called Saving and Loan for Housing, on the pattern of the British Building Societies and American Savings and Loan Associations, were established. They were encouraged by the government through tax holidays.

These institutions grew rapidly during the 1970s, their number reaching up to 16 institutions before the revolution, three of them based in Tehran. In 1977, they were able to provide about a fifth of the credit for construction, as compared to a third by the major public bank, Rahni. Their heavy interest rate (14 to 15 per cent) made them able to make huge profits, e.g., Kourosh Company was paying an annual 40 per cent profit to its shareholders during 1974-77 (VMS, 1981; Dezhkam, 1985).

Another form of financial institution for housing was the Housing Saving Fund which was first established in 1958 by the public Rahni Bank. After the success of the Saving and Loan for Housing institutions, other public and private banks rushed to establish this form of activities. These financial institutions were all nationalized after the
revolution and incorporated into the banking system. The new private financial institutions, which now rival the nationalized banks, are the charitable funds which attract large sums of money.

The impact of banks and financial institutions on urban form has been through their policies and preferences, mostly in favour of large scale producers, towards the process of production and distribution. Therefore, the form and the level of availability of credit and loans to the producers and consumers have played a decisive role in determining urban form. An example of their role is the growing number of townlets and large housing estates whose development was made possible by the credit from these institutions. This has been distinct from the piecemeal development by those who have had no access to credit.

5.3.3. Housing Cooperatives

Since the mid-1960s, in line with encouragements for savings and loan arrangements, housing cooperative were established. Until 1974, there were 360 housing cooperatives with 180 thousand members, mostly white collar civil servants, and 180 cooperatives with 11 thousand blue collar members (Dezhkani, 1985). These organizations, however, failed to produce housing in large number due to shortage of capital and land as well as bureaucratic and management difficulties.

After the revolution, with support and encouragement of the government to expand the cooperatives, their number increased to 3860 in 1984: 1473 workers cooperatives with 198 thousand members and 2387 non-workers cooperatives with 462 thousand members. 87.7 per cent of the cooperatives were formed by public sector employees (83.8 per cent in Tehran). In this year, 27.8 per cent of all the cooperatives and 36.3 per cent of their members have been concentrated in Tehran (MAI, 1987b). By 1984, however, only 20 per cent of the co-ops (12 per cent in Tehran) were able to launch the construction of their dwellings. The failure of other cooperatives was mainly due to difficulties in the provision of land (75.6 per cent, 64.4 per cent in Tehran), capital (23.6 per cent, 23.4 per cent in Tehran), and legal procedures (33.1 per cent, 48.3 per cent in Tehran).

In 1984, there was an average number of 98 dwellings in each housing cooperative which had started their buildings. Therefore, the size and the aggregate form of their demand and the serious shortage of land have had decisive implications for urban
form. A best example of this is one of the sample quarters described in Chapter Two, Shahrak- Qods. In attempting to make more use of urban land, and to eradicate the monopoly of the higher income groups over this new town, housing cooperatives were allocated the undeveloped lands, including those meant for green space. They were allowed to aggregate two or three land parcels and build up to four storeys, permissions not available to other applicants for development. The result has been numerous medium rise buildings and a rather high density which has dramatically changed the urban form in Shahruk-Qods.

5.3.4. Landowners

There is no adequate information on land ownership. Even after the nationalization of urban land in 1980, the public organization responsible for appropriation of land confronted serious difficulties due to the shortage of information. Nevertheless, it is generally acknowledged that there has been a gradual change in the pattern of land ownership in Iran since the nineteenth century.

With the change of dynasty and the development of capitalism, aristocratic landowners sold or developed their lands during the inter-war years. The development process in the sample quarter Daneshgah, whose land belonged to an aristocrat of the old dynasty, exemplifies the power of the landowners. Immediately after the imposition of a new network on the urban fabric, he had an entirely free hand in apportioning this large area, then being suburban land, to be consumed by the ever expanding urban fabric. The founder of the new dynasty, however, was able to force him to devote a large portion of the land for the development of Tehran University. This, and the street pattern of this quarter which had to conform to the newly laid avenues, however, show the limits which the state could put to the freedom of the landowners. Nevertheless, this level of control, limited as it was, diminished after the second world war.

The establishment of the new royal family was followed by them becoming the largest landowners of the country. The rapid expansion of the urban fabric and the appropriation of suburban vacant land brought a new breed of landowners. By the 1970s, according to some reports (Hafizi, 1980:119), 85 per cent of urban lands belonged to the shah, the royal family, and a few big landowners. In Tehran, as the official newspaper of the newly established state party announced, only 10 per cent of the landowners accounted for 90 per cent of the 80 million square metres of land on the outskirts of the city (Rastakhiz, 12th December 1976).
Even though the unused urban land has been nationalized after the revolution which toppled the royal family, the large landowners have continued to exert their influence over the land market and government land policies.

The impact of landowners on urban form has been one of the least restricted ones. Before the introduction of planning system, they were able to subdivide the urban land in whatever way they wanted. This demonstrates the effectiveness of their decisions on urban form, which, apart from the state influence, has not been matched by any other development agency so far.

5.3.5. Estate Agents

With the flourishing of land and housing market after the second world war, the Tehran’s estate agents proliferated to reach 1,000 in the early 1960s (Naraghi, 1964). Traditionally, these have been in the form of small, one-man shops involved in land and property transactions in a limited locality. At no time did this fragmented form of agents develop into an organization operating at the level of the city.

Nevertheless a development of the estate agents into more formal firms resulted in a wider geographical area of interest for the new agents. This process has expanded after the revolution and the estate agents have continued to practise an influence in spite of the restrictions from the government and the nationalization of urban land.

Estate agents have had an intermediary impact on form through their presence in the land and housing market. It was at a peak in the early post-war period when they could even plan how to subdivide the urban land on behalf of the landowners (Naraghi, 1964). In absence of the required professionals, they provided the kind of expertise which the landowners needed. With the proliferation of the relevant skills, however, they have generally retreated from the design process and have focused on transactions.

5.3.6. Individuals

The high proportion of housing being developed for personal consumption indicates the importance of individuals who develop their own dwellings. In rural areas and in the poverty ridden neighbourhoods and shanty towns, the self help process of housing
provision has been dominant. Even in those cases, there are usually present a few skilled construction workers who supervise the members of the household working as the unskilled workers (Madani Pour et al, 1984; 1985).

In the majority of cases, however, they have to employ a team of construction workers headed by a master builder. Therefore, as with the other types of investors, they play the role of a client capable of decision making process and affecting the form through their opinions. The small scale of the investment made by these individuals, as mentioned, usually leads to the building of a one to three storey structure. Variation between different locations around the city occurs mostly according to the planning regulations and land price.

Large numbers of the houses in the sample quarters, the older Oudlajan and Baharestan as well as the more recent Shahrek-Qods, have been developed by the individuals who acted as a client employing a team of builders or a construction company. In the more recent developments, the involvement of an architect has been required.

5.3.7. Developers

This category covers a wide range of development agencies according to their size and, subsequently, form of production. It also covers both areas of formal and informal development agencies.

The smallest scale developers are those who acquire a land parcel to develop and sell. This form of production, which was expanding with the expanding demand for housing, has been usually carried out by an individual, usually a master builder (Mimar). Nevertheless, the profitability of house-building has attracted many others to this trade. At the height of development activities in the 1970s, they could be civil servants, doctors, as well as architects and engineers.

The individual developers do not often set up a formal firm, i.e., a registered company with an office in a certain location. Due to the nature of work, their office is the construction site or their home. Their only contact with formal procedures is when they intend to buy the land or sell the developed property, when they have to pay tax. In order to reduce this procedure and the amount of tax, they might ask the landowner to transfer the land to the buyer of the building sometime towards the end of construction process, as if the land has been developed and sold by the landowner. Because the tax
is charged at the time of transaction, the number of transactions and, therefore, the amount of tax is reduced.

There is also a formal version of the individual developer in the form of small construction companies. These firms have been comparatively further up-market and their legal status and established office have secured them a certain place in the development industry.

The individual developer or the small firm supervises a team of skilled and unskilled workers and a number of contractors during the construction process. With an increase in the number of sites and the dimensions of the work, the developer would be able to run the team on a more permanent basis. Construction work, however, is seasonal and the workers might have agricultural duties in their village of origin.

After the second world war, along the large scale increase of Tehran's population, the high demand for the production of houses gave rise to a considerable proliferation of developers, resulting in an expansion of the scope and size of developers, to reach its peak in the 1970s.

The impact of this change of size on the organization of production was, at first, the multiplication of the sites under construction by one developer. Later, with the escalation of land price, amongst other things, it was an intensified use of land. The implication of the change for urban form was that, in the former case, the developer would develop a row of identical houses, or a number of identical houses spread in a neighbourhood. In the latter case, it led to the development of medium and high rise buildings.

In some cases, the size and scope of the developer's work could be larger still. In this case, they would develop whole neighbourhoods and urban quarters, as exemplified by the sample quarter Shahrara which was all developed by a single developer.

With the growing size of developments and thus the required capital investment, yet another breed of developers stepped into the development industry. With the help of banks and the royal family, some of them were able to develop new towns in and around the capital city, which provided them with unheard-of profits. A prime example of such a joint venture is the sample quarter Shahrak-Qods whose development was
left unfinished due to the advent of revolution. The large number of new towns around Tehran is an evidence of the growth of this breed.

The development of new towns often took two forms. In the first form, the acquired land was subdivided and provided with infrastructures. It was then sold to individuals or companies who developed the land, as was the case in Shahrak-Qods. In the other form, the buildings were also built by the developers before being sold, as in Shahrrara. In both cases, however, a large portion of the developers' capital came from the considerable deposits which they charged the potential buyers. In a few instances, the developers fled with these deposits without even developing a single structure. In spite of the inadequate data, it seems that international developers were only beginning to be involved in the production of urban fabric in the 1970s, or even earlier, which remained ill-fated due to the advent of the revolution.

The impact of the developers on urban form is, therefore, set through their organization and their interaction with the instruments of production. The large scale firms, or those with access to large sums of capital, have often developed large scale schemes using new technologies and standardized forms. The small scale developers, however, have only been producing small schemes with lower quality and more variety of form.

5.3.8. Contractors

Contractors are individuals or firms who carry out construction work for the investors. Like developers, they have taken a wide range of forms. At the smallest scale, there are specialized individuals, like electricians, plumbers, etc., who usually work as subcontractors for developers or construction companies. At this level, they should be seen as one of the upper strata of the labour force.

At next level, there are small construction companies which can be contractors as well as developers. Indeed, a small firm can operate on both bases depending on its capital.

An individual "mimar" has traditionally been a builder in charge of the erection of the building as a contractor to the owner. In that role, the "mimar" performed as a combination of an architect, an engineer, and a master mason. It has been after the new division of labour and dramatic profitability of construction works that they have turned to act as developers. They have often entered the business as an unskilled worker and have progressed to the stage of skilled workers and master builders.
technologies. Their scope of influence may vary from total urban fabrics, in planning projects, to single buildings.

5.3.10. Material Manufacturers and Retailers

The south of Tehran is a concentration of manufacturers of building materials. Large companies which need large quantities of material often contact directly these manufacturers. There are, however, numerous retailers around the city who supply the localities. These retailers have usually strong links with small firms and developers as well as with some specialist subcontractors.

The impact of these manufacturers and retailers on urban form should be traced through the type of product they produce and distribute, its quality, price, and availability, which will be discussed separately.

5.4. Conclusion

The development agencies which are involved in the construction sector, are linked to their social and physical contexts through their purpose and their relationship with instruments of production. Most of these links are based on the medium of money, due to commodification of space and increasing patterns of capitalist production in construction. Yet there exist other forms of personal and communal relationships, some of them reminiscent of pre-capitalist social relations, which put the agencies in contact with each other and with their contexts.

The public sector development agencies are formed of ministries in charge of the production of space, the municipalities, and various intermediate organizations. Their instruments, investment of public money, development policies, and planning system, have enabled them to, supposedly, pursue public interest in addition to promote private interest. Therefore, they have operated both on the basis of a social rationality to de-commodify some services and spaces, and an instrumental rationality which pursues the interests of a certain public institution or of some private individuals such as the members of the royal family.
The increasingly complex and centralized organization of the public agencies has led to the development of large scale schemes such as the transformations of Tehran and various other projects ever after.

Nevertheless, despite the existence of some degree of social rationality, the disorder and conflict between the public sector agencies, their inefficiency, and their aim of promoting the private sector, lie behind the disorder and inequality of the Tehran’s internal structure.

Private sector development agencies are a whole array of increasingly specializing agencies whose prime motive of development, seeking self interest, has led them to focus on housing production. In addition to these agencies, whose rationality relies on "profitability" of production, there are agencies who develop for their own use, hence relying on the rationality of "usability". In a country which has been integrating into capitalist economy, development for exchange was rising, before the revolution and war have slowed it down, resulting in an increase in development for use.

The private development agencies include banks, financial institutions, housing cooperations, landowners, estate agents, individual producers, developers, contractors, consultants, and material manufacturers and retailers. They are mainly categorized according to their relationship with the resources through their possession of money and through the rules and ideas governing the flow and application of resources.

Therefore, those who invest have a more effective stake in urban fabric than those who work. Yet the latter have also had their way of influencing the form of the built fabric. The size, organization, and the interrelationship of the development agencies have critical effects on the size and form of the development.

In general, through their involvement with development factors, their instruments of production and the structural constraints of these instruments, the private development agencies exert an important impact on form. In spite of their relative importance, however, these agencies have had to adapt to the structural patterns of urban form which were set by the public development agencies, issues which will be discussed further in the next two chapters.
Chapter Six

DEVELOPMENT FACTORS:
RESOURCES
This chapter seeks to explore the dynamics of the main resources involved in the development process, including finance, labour, land, building materials, and technology. These are factors used by the development agencies as instruments of production. Nevertheless, each of these factors are also subject to, and constituting, structural constraints which frame the operation of the development agencies.

An examination of development factors, their physical entities as well as their associated rights and social relations, will provide a more detailed account of the interaction of the development agencies with them. This examination of resources will be supplemented with that of rules and ideas in the next chapter.

These development factors will be discussed at a social dimension, tracing the general influence they exert upon urban form, as distinct from their role in the specific circumstances of a more detailed investigation of development process. This implies a focus on general urban development processes and on general characteristics of urban form, as identified in Chapter Two. The study, therefore, will not focus separately on the development factors used in the urban development process in each sample quarter or in the development of the different variable discussed. As mentioned earlier, the main reasons for this include the intention of the study to explain the general characteristics of urban form and the limited availability of information.

6.1. Finance

In a commodified economy, money is the major medium through which development agencies are related to each other, to their contexts, and to their instruments. It is, therefore, the main instrument of production especially since the socio-economic change which has given rise to the process of commodification of space. Availability of financial resources enables development agencies to have access to land, to acquire the building materials and technology, and to employ the workforce. At the same time, they are subject to the dynamics of market and the rules which dominate the process.

6.1.1. Financing the Production of Urban Fabric

Building activities seem to have been always associated with the existence of some form of surplus. When there has been political stability, this surplus could have been
used in construction. This was the case in the sixteenth century walls of Tehran, as a part of the vast construction programmes of the Safavids, and has been the case ever after. As opposed to this are the periods of war, political instability, and economic decline in which new buildings are being built at a lower rate and the existing fabric is undermined, suffering from the lack of maintenance.

In the second half of the nineteenth century, the increase in foreign trade and agricultural production provided new sources of revenue for the government as its main income was formed of the tax on trade and agriculture. The building of new walls and moats for Tehran and palaces inside the royal compound, as well as the ceremonial events and European trips of the shahs and their entourage were financed in this way (Amirahmadi & Kiafar, 1987).

Between the world wars, two periods of the growth of gross domestic fixed capital formation are identified, 1926-30 and 1931-8, whose rates of growth are higher than the first quarter of the century but similar to the post-war growth periods (Bharier, 1971). These are periods marked by the availability of funds. The first growth period owed much to the reorganization and centralization of financial administration. The trough between the two was caused by the great worldwide depression and the government's attempt to put the economy on a strict, centrally controlled basis.

The transformation of Tehran, as well as a number of other well-publicized government enterprises, were carried out in the second growth period in the 1930s. These were funded by new taxes, increased oil royalties, a fluctuating customs surcharge, and some savings by inflation (Bharier, 1971).

After another trough caused by the second world war, the construction boom of 1946-49 was partly spending the funds built up by the Allied expenditure in the country. During the period 1953-58, capital formation which had slowed down due to the nationalization of oil industry in the early 1950s, rose due to the financial backing which the resumption of oil revenue and a certain amount of deficit finance provided. The crisis of the early 1960s and the fall in capital formation was reversed in the period 1963-77 in which the rapidly increasing oil revenue and the reliable banking facilities supported capital formation (Bharier, 1971: 49-53). This period, which is especially marked by the dramatic increase in oil price in 1973 ended with another economic crisis and a revolution. Another rise in capital formation in the early 1980s due to the
increase in oil revenue came to an end because of the falling oil revenue and the disastrous effects of the war with Iraq.

6.1.2. The Construction Sector and National Economy

The construction sector has played a major role in the Iranian economy. The share of the value added by construction in the Gross Domestic Product has been rising from 2.5 per cent in 1959 to reach 6.2 per cent in 1976 (Table 6.1). The construction sector has expanded more than other sectors of the economy. During the period 1959-83, whereas the GDP has increased 413.6 per cent in fixed prices, the growth of the value added by construction activities has been 706.1 per cent. In some instances, this gap has been even larger, as in the period 1975 and 1976 when, after the dramatic increase of oil revenue, the rate of growth of construction sector has been 106.9 per cent as compared to 20.9 per cent for the GDP.

The importance of the construction sector is best reflected in its share in gross fixed capital formation (Lean & Goodall, 1977;317), which can be considered in an expenditure approach to the GDP (Pass et al,1988). In Iran, capital formation in construction has nearly always been the major constituent part of the Gross Domestic Fixed Capital Formation (GDFCF). Apart from a short inter-war period, it has continually formed more than half of the GDFCF (Table 6.2). After the second world war, construction sector has been expanding so that, during the space of only one decade, 1966-76, capital formation in this sector has grown more than sixfold (Table 6.3).

In 1975, when investment in other sectors had grown considerably, the share of construction in the GDFCF reached a minimum of 54 per cent. It, however, started to increase after the beginning of recession in 1976. In 1977, whereas the GDFCF had declined 8.3 per cent in fixed prices, investment in construction increased 60.4 per cent. During the revolution, with the dramatic decline in industry and agriculture, the share of construction increased continually to reach the maximum of 76.8 per cent in 1980. This course of events, however, changed with the relative improvement in the investment in other sectors, which has led to a decrease in the share of construction down to 56.5 per cent in 1983 (Table 6.3).

This process has been generally consistent with the growth of the GDFCF which has been gradually growing from 15 to 17.4 per cent of the GDP during the period 1965-

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<th>Gross Domestic Product</th>
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Note: According to the definition of the BMI (Central Bank of Iran), the construction sector includes development of residential and non-residential buildings and also roads, tunnels, canals, ports, airports, and the like, developed by both public and private sector.
Table 6.2. Estimated Share of Building in Gross Domestic Fixed Capital Formation, 1900-65 (Percentage).

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Source: Bharier, 1971:54-5.

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<tr>
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<th>Percentage to Gross Domestic Product</th>
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<td>1983</td>
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Note: Difference in the figures of this and the previous table stems from the difference in definitions and methods of estimation and calculation by the sources.
74. This proportion suddenly rose to 28.1 and 32.2 per cent in 1975 and 1976 when it started to decline to reach 18.7 per cent in 1979. A growth after 1981 increased it to 25.2 per cent in 1983.

The unprecedented expansion of construction activities was a direct outcome of the rapid expansion of urban population after the second world war. The surplus of capital and labour which had been resulted from an increasing oil revenue and restructuring of agriculture by an expanding centralized bureaucracy, was to be absorbed partly by the construction sector. Construction was encouraged by the government due to two main reasons. On the one hand, the growth of this sector, constructing plants, communication, and housing, has been regarded as a precondition for the development of other sectors of economy. On the other hand, the development has been easier to achieve in construction than in manufacturing industry and agriculture (Halliday, 1979).

The construction industry has been directly related to, and has had impact on, the fluctuations of the national economy. As is shown (Table 6.1), apart from the smaller fluctuations, the periods of recession and boom in the construction has been nearly similar to those of the national economy. However, a one year lag is traceable between the two, whereas the peak of the construction activities was in 1976, the national economy continued to grow until 1977. This indicates the effect of this sector on the whole economy, its sensitivity to the decline in the oil revenue as compared to other sectors, and its relative economic instability.

The construction sector has practised an important impact on other sectors through creating greater demand for their products, both by its strong relationship with other sectors and by generating income which increases the demand for goods and services. This is reflected in the fact that, in 1974, the construction sector was the second largest purchaser of intermediary goods after the government, and wages in this sector have been the third highest, after the civil service and manufacturing industry (Dezhkam, 1985:169).

6.1.3. Public and Private Sectors’ Investment in Construction

The response to enquiries as to how much the public and private sectors have invested in the production of built environment, in what areas, and in what forms have crucial implications for the built form.
Historically, it appeared that the contribution of the public sector in the construction industry has formed a smaller, but more important, part than that of the private sector. A comparison of the expenditure on buildings by government ministries during the period 1926-65 (Table 6.4) with that by private sector (Table 6.5), even though different in scope, shows their difference. Even when public expenditure figures have included construction of roads, the comparison identifies the public sector as spending far less than the private sector.

This course of events, however, changed since the rapid economic development of the mid-1960s (Table 6.6). From 1967, the government's investment in construction surpassed that of the private sector and, by 1976, increased sixfold in fixed prices. In this year, the highly centralized and bureaucratized government which injected the oil revenue into the economy through development planning, was capable of constituting up to 66.9 per cent of the investment in construction in 1976.

The public-private proportion once again changed in 1979 when a 54.9 per cent decline in public investment occurred. Between 1979 and 1983, the share of the private sector has been slightly higher, somewhat similar to the early 1960s.

In 1978, although the public sector investment grew 4.9 per cent in fixed prices, the decline of the private sector from investment, the economic recession, and widespread strikes reduced the capital formation in this sector about 11.5 per cent. After the revolution, during the period 1979-1983, a total of 2,093 billion rials (in fixed prices) were invested by both the public and private sectors, indicating a 16.9 per cent decrease from the same period before the revolution.

6.1.4. Areas of Involvement

In the nineteenth century, the government was not basically engaged in development of urban fabric. Housing, commercial, and industrial buildings were all developed by the private sector. Most of public facilities such as baths, water reservoirs, wells, mosques and schools were built by private individuals, usually being wealthy merchants, endowment institutions, or members of the ruling aristocracy. The government's share was confined to development of palaces and a few prestige mosques and shrines.
Table 6.4. Expenditure on Buildings by Government Ministries, 1926-65, (Million Rials at Current Prices).

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<td>1962</td>
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</tr>
<tr>
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<td>61.0</td>
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<td>216.3</td>
</tr>
<tr>
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<td>1964</td>
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</tr>
<tr>
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<td>24.1</td>
<td>1965</td>
<td>149.0</td>
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</tbody>
</table>

Source: Bharier, 1971:233

Note: * Includes expenditure on roads.
Table 6.5. Expenditure on Private Commercial and Industrial Buildings, 1900-65, (Million Rials at Current Prices).

<table>
<thead>
<tr>
<th>Year</th>
<th>Commercial</th>
<th>Industrial</th>
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<td>1900-21</td>
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<td>2</td>
</tr>
<tr>
<td>1921-30</td>
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<tr>
<td>1931</td>
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<td>13</td>
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<tr>
<td>1932</td>
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<td>1933</td>
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<tr>
<td>1934</td>
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<td>2,083</td>
<td>410</td>
</tr>
<tr>
<td>1954</td>
<td>2,711</td>
<td>489</td>
</tr>
<tr>
<td>1955</td>
<td>2,782</td>
<td>720</td>
</tr>
<tr>
<td>1956</td>
<td>3,136</td>
<td>708</td>
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<tr>
<td>1957</td>
<td>3,540</td>
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<tr>
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<td>1962</td>
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<tr>
<td>1963</td>
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### Table 6.6. Investment in Construction by Public and Private Sectors 1959-83 (Billion Rials at 1974 Fixed Prices).

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<td>1968</td>
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<td>22.4</td>
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<td>1972</td>
<td>168.9</td>
<td>16.0</td>
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<td>192.1</td>
<td>13.7</td>
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<td>212.0</td>
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<td>409.0</td>
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<td>0.9</td>
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<td>1981</td>
<td>193.3</td>
<td>-1.0</td>
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<tr>
<td>1982</td>
<td>216.1</td>
<td>11.8</td>
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<tr>
<td>1983</td>
<td>229.0</td>
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### Table 6.7. A Summary of the Changes in the Number of Buildings in Tehran During 1852-1902.

<table>
<thead>
<tr>
<th>Buildings</th>
<th>1852</th>
<th>1902</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Houses</td>
<td>7,872</td>
<td>16,725</td>
<td>8,403</td>
<td>106</td>
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<tr>
<td>Baths</td>
<td>153</td>
<td>182</td>
<td>29</td>
<td>18</td>
</tr>
<tr>
<td>Shops</td>
<td>3,791</td>
<td>9,420</td>
<td>5,629</td>
<td>148</td>
</tr>
<tr>
<td>Caravanserais</td>
<td>78</td>
<td>186</td>
<td>108</td>
<td>138</td>
</tr>
<tr>
<td>Mosques &amp; &quot;Madraseh&quot;s</td>
<td>116</td>
<td>80</td>
<td>-36</td>
<td>-31</td>
</tr>
<tr>
<td>&quot;Takyeh&quot;s</td>
<td>54</td>
<td>43</td>
<td>-11</td>
<td>-20</td>
</tr>
</tbody>
</table>

The larger share of the private sector in the production of urban fabric is shown by a comparison of three census of Tehran during the second half of nineteenth century (Table 6.7). It shows that, firstly, the bulk of the urban fabric was formed of uses mainly developed by private sector, and, secondly, the main growth of fabric has taken place in construction of houses, shops, and caravanserais, the area in which almost no government involvement has occurred.

It has been, however, by the centralization of the political authority and some improvement in economic performance that the government has sought interference in the production of urban fabric. Restructuring of the walls and moats in the 1870s reflects such a move. The previous large scale urban development scheme, erecting the 1553 walls, was also carried out by a strong centralized government.

These interventions in urban development have been intensive activities in short periods and relatively smaller in size when compared to the private sector's involvement over the long periods between them. They are, however, due to this particular reason, very important in their potential to channel the private sector's development activities in certain ways. The walls and moats of the 1870s and the transportation network of the 1930s both were providing frameworks on the basis of which urban fabric was produced and whose form was conditioned. The same is true of the post-war construction of new roads, infrastructures, and major public buildings. These have acted as frameworks to which the private sector producers have had to adapt. This is essentially different from the nineteenth century when the major public buildings, with their monumental importance in the urban space, were produced by both the individuals and the state.

Housing, which has the largest single share in urban fabric, more than 40 per cent of the Tehran's urban fabric in the 1960s (Farmanfarmaian & Gruen, 1968), has been traditionally the main area of private sector's involvement. As shown in table 6.2, housing have formed the majority part of the construction works for long periods, its share reaching more than 50 per cent during the post-war housing boom. This is an indicator of the degree of the contribution of the private sector to the production of the urban fabric. Even in the 1970s, at the peak of public sector's engagement in the development process, its share in housing provision never surpassed 24 per cent (Table 6.8). After the revolution, its share declined even further down to only 6.7 per cent in 1983.
Table 6.8. The Shares of Public and Private Sectors in Capital Formation for Housing in Iran, 1973-83 (Billion Rials at 1974 Fixed Prices).

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Capital</th>
<th>Private Sector %</th>
<th>Public Sector %</th>
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</thead>
<tbody>
<tr>
<td>1973</td>
<td>112.6</td>
<td>89.4</td>
<td>10.6</td>
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<tr>
<td>1974</td>
<td>137.0</td>
<td>76.0</td>
<td>24.0</td>
</tr>
<tr>
<td>1975</td>
<td>202.4</td>
<td>78.8</td>
<td>21.2</td>
</tr>
<tr>
<td>1976</td>
<td>279.7</td>
<td>76.7</td>
<td>23.3</td>
</tr>
<tr>
<td>1977</td>
<td>250.4</td>
<td>86.1</td>
<td>13.9</td>
</tr>
<tr>
<td>1978</td>
<td>246.0</td>
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</tr>
<tr>
<td>1980</td>
<td>220.6</td>
<td>90.9</td>
<td>9.1</td>
</tr>
<tr>
<td>1981</td>
<td>178.4</td>
<td>87.7</td>
<td>12.3</td>
</tr>
<tr>
<td>1982</td>
<td>197.8</td>
<td>84.5</td>
<td>15.5</td>
</tr>
<tr>
<td>1983</td>
<td>255.0</td>
<td>93.3</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Source: Dezhkam, 1985:205; Rafi'i, 1986:43.


<table>
<thead>
<tr>
<th>Year</th>
<th>Construction Sum</th>
<th>Housing Sum</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>121</td>
<td>101</td>
<td>83.6</td>
</tr>
<tr>
<td>1974</td>
<td>125</td>
<td>104</td>
<td>83.4</td>
</tr>
<tr>
<td>1975</td>
<td>178</td>
<td>154</td>
<td>89.3</td>
</tr>
<tr>
<td>1976</td>
<td>245</td>
<td>214</td>
<td>87.4</td>
</tr>
<tr>
<td>1977</td>
<td>246</td>
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<td>1978</td>
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<td>88.5</td>
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<td>1980</td>
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<td>156</td>
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<td>1982</td>
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<tr>
<td>1985</td>
<td>249</td>
<td>224</td>
<td>90.1</td>
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</table>

With the sudden rise in oil revenue and, subsequently, construction activities, the share of housing in private investment rose even further. Between 1973 and 1985, the share of housing never went below 83.4 per cent of all private investment in construction (Table 6.9). In 1985, 97.4 per cent of the private investment in new buildings in urban areas of Tehran province have been made in the production of housing. In 1984, this proportion was 94.3 per cent. Other uses have been mainly retail development (BMI, 1987; 1986).

The private sector's involvement in housing development has been essentially seeking self-interest through either use or exchange of the product. That is why, along with the rapid urbanization, the private investment has grown so dramatically in the areas where the demand has been at its highest.

The private investment in construction has been concentrated mostly in urban areas (Table 6.10). At no time during 1959-82, the percentage of investment in urban areas has gone below 82.2 per cent. Indeed in 1975 and 1977, urban areas accounted for more than 90 per cent of all the private investment in construction. The share of rural areas which accounted for 14.8 per cent in the decade 1963-73, fell to 10.6 in the period 1974-77. It did not pass 12.7 per cent during 1978-82, in spite of the intensified encouragement of the revolutionary government.

Concentration of investment in urban areas was consistent with, and gave rise to, an increase in urbanization. It had a direct relationship with the uneven urban system which was emerging. Within urban areas, it has been the capital and the large cities which have accounted for the largest portion of investment (Table 6.11). During the twenty years before the revolution, 47.3 per cent of the private investment in construction was made in Tehran, 26.1 per cent in the large cities, and only 26.6 per cent in other urban areas.

The level of investment in Tehran reached its peak of 62.8 per cent in 1969. After that, there has been a general decline in the share of Tehran, which has been in line with the patterns of population growth due to the beginning of large scale suburbanization with the help of buses and motor cars. This decline in investment intensified with the decentralization policies of the revolutionary government, to reach the level of 19.3 per cent in 1984. As against this, the other large cities initially attracted private investment in the 1970s. Since the revolution, however, smaller urban areas have had increasingly larger shares.
Table 6.10. Investment in Construction by Private Sector in Urban and Rural Areas, 1959-83 (Billion Rials at 1974 Fixed Prices).

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</tr>
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<td>34.1</td>
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<td>44.3</td>
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<td>19.3</td>
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</tr>
<tr>
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<td>59.4</td>
<td>45.4</td>
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<td>70.0</td>
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</tr>
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<td></td>
<td>156.2</td>
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<td></td>
<td>93.8</td>
<td>34.0</td>
</tr>
<tr>
<td></td>
<td>114.1</td>
<td>-27.0</td>
<td>37.0</td>
</tr>
<tr>
<td>1978</td>
<td></td>
<td>87.0</td>
<td>-7.2</td>
</tr>
<tr>
<td></td>
<td>130.0</td>
<td>13.9</td>
<td>38.4</td>
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<td></td>
<td>103.4</td>
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</tr>
<tr>
<td></td>
<td>127.7</td>
<td>-1.8</td>
<td>30.0</td>
</tr>
<tr>
<td>1980</td>
<td></td>
<td>140.2</td>
<td>35.6</td>
</tr>
<tr>
<td></td>
<td>87.6</td>
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<td></td>
<td>137.8</td>
<td>-1.7</td>
</tr>
<tr>
<td></td>
<td>105.1</td>
<td>20.0</td>
<td>24.4</td>
</tr>
<tr>
<td>1982</td>
<td></td>
<td>135.8</td>
<td>-1.5</td>
</tr>
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<td>35.8</td>
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</tr>
<tr>
<td>1983</td>
<td></td>
<td>19.3</td>
<td>34.1</td>
</tr>
<tr>
<td>1984</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

The increase in the availability of money from 1973 was followed by a larger share for the public sector in the provision of housing. Within two years, 1973-75, the capital formation for housing nearly doubled and, only in one year, 1973-74, the public sector's share rose from 10.6 to 24 per cent (Table 6.8).

As compared to housing which is dominated by the private sector, most other construction works are initiated by the government. These have included the provision of infrastructures, development of ports and airports, public facilities, and government buildings, both civil and military.

As mentioned earlier, these tasks have been possible to be undertaken at the times of political stability and economic prosperity. As the table (6.2) shows, in the 1930s, capital formation in non-residential buildings has been more than that in housing. This is the period of the second restructuring of Tehran as well as of many other public works such as the development of Trans-Iranian railway. Another period with a higher share of non-residential construction works, which is also identified with rapid economic development, started in the mid-1950s and ended in 1978 (Table 6.3). These two periods came to their ends with the outbreak of the second world war and the revolution in which the government was politically and economically paralysed. In broad terms, therefore, it is these historical, destabilizing events, which have given rise to a decline in the investment in the production of built environment by both public and private sectors. Similarly, the stable periods between these focal points have witnessed the intensification of the production process by both sectors.

6.1.5. Distribution: Patterns and Policies

In Iran, the main source of income has been controlled by a state one of whose major targets, at least until the revolution of 1979, has been to promote private enterprise. The outcome of this combination has been a constant flow of money from the government to private hands, although with varying amounts at different times. Construction has been one of the important channels for this flow. Certain development agencies, such as banks and financial institutions, have been the agents of this transfer and have provided its channels. It has been the policies of these agents, therefore, within the framework of the government policies, which have been instrumental in the form of distribution of credit and mortgages and hence, to a large extent, effective in the form of the development.
The banks credit to the private sector grew thirteen times between 1967 and 1977 (Razzaghi, 1988). The construction and housing sector accounted for a major proportion of this credit (Table 6.12). On the verge of the revolution and after that, with the decline in the other sectors of economy, construction has been allocated an increasing share, to reach 34.9 per cent of all granted credit in 1982.

Since the private sector has been mainly involved in the production of housing, the bulk of the credit has been devoted to house-building. The increasing importance of the financial agents in the housing development is manifest in the share of their credit in the capital formation for housing (Table 6.13). Nevertheless, it also shows the inability of these agencies to cope with the rising demand, which has been financed through personal networks and informal financiers.

Until the end of the 1970s, the housing credit system was increasingly biased towards the higher and middle income groups concentrated in Tehran and other large cities. The average amount of the loans, especially in Tehran, was not sufficient for the construction or purchase of a property. A maximum of 70 per cent of the property's value was granted as mortgage. However, the assessment often was based on a price much lower than the market price, implying that the buyer was required to own at least about 65 per cent of the real price (VMS, 1977:310). Apart from the considerable amount of deposit which the banks required, a high interest rate of 9 to 12 per cent, with an extra 1 to 2 per cent charges, meant that only certain income groups were eligible. These factors proved to be detrimental for the low income groups to have access to home ownership in a period of rapid increase of rents, hence intensifying the social divide (Dezhkam, 1985; Rafi'i, 1986; VMS, 1977).

After the revolution, serious attempts were made to offset this biased policy. Nevertheless, the low income groups have continued to be deprived of credit facilities. This is mainly due to the increase in the land and housing prices, decline in purchasing power of the population, and the large gap between the amount of loans and the costs of building or buying.

The loans were mostly made for purchase and not for construction, which thus increased the demand without giving similar impetus to the production and maintenance. Most of the banks and financial institutions were involved in granting mortgages. In addition to Bank-e Rahni, these included Bank-e Farhangian for teachers,

<table>
<thead>
<tr>
<th>Year</th>
<th>Housing &amp; Construction</th>
<th>Internal Trade</th>
<th>Foreign Trade</th>
<th>Agriculture</th>
<th>Mining &amp; Culture</th>
<th>Manufct.</th>
<th>Others</th>
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<td>8.1</td>
<td>15.1</td>
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<td>13.8</td>
<td>6.3</td>
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<td>29.0</td>
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<tr>
<td>1973</td>
<td>12.7</td>
<td>28.7</td>
<td>16.7</td>
<td>7.6</td>
<td>18.6</td>
<td>15.7</td>
<td></td>
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<tr>
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<td>25.1</td>
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<td>12.9</td>
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<td>1977</td>
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<td>9.4</td>
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<td>14.9</td>
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<td>20.3</td>
<td>24.4</td>
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<tr>
<td>1981</td>
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<td>3.9</td>
<td>11.0</td>
<td>17.8</td>
<td>28.2</td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>34.9</td>
<td>11.7</td>
<td>5.2</td>
<td>9.8</td>
<td>20.9</td>
<td>17.5</td>
<td></td>
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</tbody>
</table>


<table>
<thead>
<tr>
<th>Year</th>
<th>Capital Formation</th>
<th>Banks’ Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Private Public Total</td>
<td>Sum</td>
</tr>
<tr>
<td>1973</td>
<td>100.7</td>
<td>11.9</td>
</tr>
<tr>
<td>1974</td>
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<td>43.0</td>
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<td>34.7</td>
</tr>
<tr>
<td>1978</td>
<td>196.4</td>
<td>49.6</td>
</tr>
</tbody>
</table>

Source: BMI, 1984; Dezhkam, 1985
Bank-e Sepah for armed forces, Bank-e Refah-e Kargaran for workers. On a specialized basis, there were few institutions such as Bank-e Sakhteman, founded in 1974, which dealt with credit for construction companies and for manufacturers and dealers of building materials (VMS, 1977:308-16). This helped to widen the gap between the supply and demand, and subsequently increase in the prices.

Since the late 1950s, the building of large scale housing schemes and high rise buildings were encouraged by the credit system. In 1968, the Bank Rahni, whose early activities since 1938 were directed towards low income groups, made an aborted attempt to confine the credit towards this form of development. Between 1975 and 1978, this bank provided more than 3.2 billion rials loan for large scale housing development (Dezhkam, 1985:240).

The increasing size of the credits was directly associated with the form of the developments. The development of the suburban townlet of Shahrak-Qods, one of the sample quarters of this study, was launched in the 1970s by the Bank Omran, most of whose shares belonged to the royal family. The willingness of the banks and the encouragement of the government led to the development of many more townlets and high rise buildings. Being carried out by the private sector, the driving force of these large scale undertakings was a large scale profit for a minority of individuals.

Nevertheless, as table (6.13) shows, a large proportion of house-building has been carried out without the help of the institutional credit system. For the producers, credit has become available through relying on the resources of the potential buyers and on the high and rapid rate of return from their investment. For the consumers, however, it has been the heavy burden of the house price which they have to carry through relying on transformation of the assets of the family, aid from relatives, and loan from informal financiers. The latter might be charitable foundations, which usually do not charge an interest rate, or the money lenders, whose rate of interest is very high indeed.

6.2. Labour

The rapid urbanization and the unprecedented expansion of urban fabric has dramatically changed the size and scope of the construction labour market. These changes have had far reaching impacts on wages, training systems, exchange of ideas and skills and, through these, on urban form.
Chapter Six

The methodological subject matters of development agencies and development factors overlap under the heading of labour. Whereas the labour force is being used as an instrument in the process of the production of space, it can be considered as a carrier of ideas and an agent of change. In this section, it has been tried to look at the subject and its impact on urban form, with regard to both these dimensions.

6.2.1. Construction and Surplus of Labour

The demise of the old agricultural structure from the second half of the nineteenth century and the rapid growth of population have created a surplus of labour, which has needed to be absorbed. The construction sector has been one of the most important employers of unskilled workers, mostly supplied by rural population. Due to the seasonal nature of both construction activities and agriculture, and their dramatic difference in wages, there has been a competition between the two, increasingly in favour of the former.

The age structure of Iran’s population (55.4 per cent under 20 in 1976) and rural-urban migration has caused a steady flow of newcomers into the urban labour markets. The emphasis on high technology manufacturing industries and the neglect of agriculture led the job-seekers to be absorbed into construction or services for jobs, where special skills were not required.

A major characteristic of employment in the construction sector has been the predominance of private sector employees, as against employees in the public sector who form a minority of the workforce. This is mainly because the public sector uses the private construction companies to build its projects. The other feature of construction is the relatively low proportion of the employers as distinct from the large numbers of employees (Razzaghi, 1988: 123).

As the table (6.14) shows, during the period 1956-86, the number employed in agriculture has declined from more than half to less than a third of the workforce. This downfall, however, has not been absorbed by mining and industry whose overall share, in spite of a dramatic expansion in absolute terms, especially in the 1970s, has only slightly increased. The main growth of employment has been in construction and services. The share of construction in employment rose from 5.7 per cent in 1956 to 13.5 per cent in 1976, which, together with the related industries and services, reached 25 per cent (VMS, 1981:150-51). These sectors, however, have not been capable of
### Table 6.14. Change of employment in different sectors 1956-86 for Iran (1000 persons, Percentage).

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Total</td>
<td>5908.0</td>
<td>100.0</td>
<td>6858.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Agriculture</td>
<td>3326.0</td>
<td>56.3</td>
<td>3169.0</td>
<td>46.2</td>
</tr>
<tr>
<td>Industry</td>
<td>1188.0</td>
<td>20.1</td>
<td>1857.0</td>
<td>27.1</td>
</tr>
<tr>
<td>Mining</td>
<td>24.7</td>
<td>0.4</td>
<td>26.3</td>
<td>0.4</td>
</tr>
<tr>
<td>Manufactng</td>
<td>815.7</td>
<td>13.8</td>
<td>1268.0</td>
<td>18.5</td>
</tr>
<tr>
<td>Construction</td>
<td>336.8</td>
<td>5.7</td>
<td>509.8</td>
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</tr>
<tr>
<td>Electric etc</td>
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<td>0.2</td>
<td>52.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Services</td>
<td>1394.0</td>
<td>23.6</td>
<td>1833.0</td>
<td>26.7</td>
</tr>
</tbody>
</table>

Source: Razzaghi, 1988:117

### Table 6.15. Activities of Urban Land Organization in Tehran Province, 1982-86 (thousand square metres).

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Appropriation</td>
<td>1007</td>
<td>5318</td>
<td>16109</td>
<td>10493</td>
<td>29025</td>
<td>61952</td>
</tr>
<tr>
<td>Under Discussion</td>
<td>1827</td>
<td>26640</td>
<td>25110</td>
<td>7139</td>
<td>6496</td>
<td>67212</td>
</tr>
<tr>
<td>Allocation: Total</td>
<td>441</td>
<td>828</td>
<td>1490</td>
<td>1714</td>
<td>1426</td>
<td>5899</td>
</tr>
<tr>
<td>Non-residential</td>
<td>31</td>
<td>235</td>
<td>31</td>
<td>57</td>
<td>159</td>
<td>513</td>
</tr>
<tr>
<td>Residential</td>
<td>410</td>
<td>593</td>
<td>1459</td>
<td>1657</td>
<td>1267</td>
<td>5386</td>
</tr>
<tr>
<td>No of Households</td>
<td>1912</td>
<td>4131</td>
<td>11308</td>
<td>11869</td>
<td>5867</td>
<td>35087</td>
</tr>
</tbody>
</table>

absorbing all the new workforce. Even in the high time of economic activities in 1976 in Iran, more than 10 per cent of the population have been unemployed. After the revolution, the employment in construction, like all other sectors of economy apart from service, fell. In 1986, employment in construction was reduced to 11.1 per cent.

6.2.2. Wages in Construction Sector

Due to the rapid expansion of building activities in the 1970s, the demand for labour surpassed the supply, which, along with inflation, led to an increase in wages. The wages of the construction workers, which during 1961-1971 had grown with an average annual rate of 7.2 per cent, nearly quadrupled between 1973 and 1977. Afterwards, in spite of the general recession, the wages continued to grow due to the inflation, although at a smaller rate, e.g., 15.3 per cent in 1979 (Dezhkam, 1985; VMS, 1981).

During the period 1961-71, the wages of unskilled workers rose faster than those of the skilled. This process was reversed between 1973-77 in which the intensification of construction activities suffered from a shortage of skilled workers, most of whom concentrated in Tehran and large cities. After the revolution, the decrease in the demand for large and luxury buildings, together with the government policy of increasing the minimum wage, once again increased the wages of the unskilled workers, which helped to reduce the gap (Dezhkam, 1985).

The cost of construction increased as a result of increases in wages, reducing the chance of certain forms of development to take place and creating a barrier for the low income groups in access to housing and facilities.

The higher wages, however, were offset by the seasonal and unstable nature of employment in construction. The migration of construction workers into the city in large numbers intensified the class divide of Tehran. Apart from those who lived on the construction sites in poor conditions, many settled down in the southern areas of the city.

The increase in the number of workforce and the increase in wages in construction sector has reduced the chance of training for many unskilled workers with rural origin. The demand for the production of space, however, has remained high, suggesting an intensified demand for the skilled workers. Many brighter unskilled workers, therefore,
were urged, after a short period of being engaged in construction works, to identify themselves as skilled. This process, which resulted from the rapid pace of production, together with problems in methods and management of construction projects, has undoubtedly led to a decline of the quality of built space.

6.2.3. Movement of Labour

Before the land reform of the early 1960s which mobilized the peasants and gave rise to their large scale migration into urban areas, the construction labour market was entirely dependent on local human resources. Construction workers in Tehran and other cities came from the surrounding countryside, where they were mainly engaged in agriculture.

With improvement of communication, development of a national market, and restructuring of agricultural land ownership, Tehran grew as the largest concentration of job opportunities, high wages, and urban facilities. Increasingly, therefore, workers were attracted from the provinces. Initially, those from the northern regions constituted the larger proportion of the workforce. Later, the less developed areas of the south, east, and west, and even the neighbouring Afghanistan, entered this market. In the 1970s, there were hundreds of thousands of foreign workers in Iran from many different countries, many of whom were involved in construction.

At the time when the local labour force could sufficiently support the local construction activities, building was carried out by a limited number of skilled workers who lived in the city. The unskilled seasonal workers lived and cultivated for most of the year on the urban fringe or in the nearby villages. The relative similarity of building materials and construction technology in the city and the village, apart from the more complex urban buildings of mosques, palaces, etc., eased this collaboration. The familiarity of the rural workers with these materials and techniques indicated their capability in undertaking construction works in the city as well as in the building of their own houses in the village.

With the introduction of new materials and techniques in the city, a gap was created between the skills found in the town and countryside. There was also a skill gap between the Iranian skilled workers and their Western counterparts. A 50 per cent difference in productivity of Iranian workers with those from advanced industrialized countries has been identified (VMS,1981:152). This has inevitably led to a loss of
quality in the application of these new techniques and materials, especially in the more complex cases.

Due to the practical absence of formal training programmes, the informal contacts and exchange of ideas have proved to have a ripple effect on the skills and concepts of the production of space. This is best exemplified by the observation of the built form in remote rural areas of the country in which, especially through migrating workers, new concepts, materials, and techniques are introduced. These are sometimes ill-grasped and badly operated, seemingly having more negative consequences in waste of resources and undermining the local architectural traditions. Nevertheless, these should be seen as the manifestation of transferring the patterns of production, resulting from the return of migrant workers as well as from other forms of communication, with strong impacts on the built form.

6.2.4. Training

Training as a formal way of transferring of ideas has been changed essentially in construction. To the traditional forms of close contacts and apprenticeship have been added formal educational courses in colleges and universities.

In the traditional apprenticeship system, to become a mason (Banna) or a master-builder (Mimar), the applicant would go under a long process of training programme from the early youth. The master-builder would be almost the single authority in the process of design and construction working with a number of masons and other related skilled workers.

In the fast growing cities, however, there has been no room for apprenticeship, both due to the shortage of the masters and to the limited available time. This is also due to the rivalry from the established educational institutions.

With the establishment of the modern universities and technical colleges, the traditional skills and their bearers are seriously undermined. According to the new division of labour, the traditional master-builder has lost his authority to design, now undertaken by architects, and his authority to supervise the construction, now undertaken by architects and engineers. Apart from the highly skilled "mimars" involved in conservation works, the new breed of master-builders are functioning as no more than site foremen.
Most of the new architects and engineers have middle and upper class backgrounds, which has enabled them to enter higher education. As with other modern institutions, these new professions are not created as the natural development of the old. Their training has been entirely based on Western lines. It is therefore not surprising if most of the university-educated groups are concentrated in Tehran. In 1980, the professional qualifications of 88 per cent of architects, 97.2 per cent of urban planners, and 77 per cent of civil engineers have been issued in Tehran (VMS, 1981: 157-8).

These factors have helped in creating a gap between the two strata of workforce in construction both in terms of social classes and in their approach to work. In the 1970s, a few attempts to bridge the gap by encouraging the traditional sector remained aborted. Inherent in this gap are, as mentioned before, confirmation of the class divide, diffusion of ideas and decline of quality. Also inherent is the gap between different concepts of space that these two different groups have and, hence, the built form they produce. The latter aspect of the gap, however, has been largely reduced in the case of speculative development where the ideas are converging due to the establishment of certain architectural fashions.

6.3. Land

This section looks at the process of commodification of land and its impact on urban form. It starts with the early formative stages, followed by the post-war boom of speculative development and the post-revolutionary nationalization of vacant urban land. Under these headings, the historical evolution of land, its patterns of ownership, supply, demand, price, and the main land policies are discussed.

6.3.1. Formative Patterns

One of the most important determinants of urban form in Tehran has been the way in which land has been released and developed. Patterns of ownership and exchange of land have changed with the fundamental changes in the political and economic systems of the country, modifying a natural resource into a commodity. Under the new system, land has become a pure financial asset, a form of "fictitious" capital (Harvey, 1989; 1982).
In the nineteenth century, as continued in the twentieth, categorization of land was largely consistent with Islamic laws. These categories included private property (Molk); crown land (Khalesseh); land immobilized for charitable or other purposes (Vaqf); vacant land with no owner (Mavat); and land which had fallen out of cultivation and abandoned (Bayer). Apart from conquest and usurpation, private property stemmed from inheritance, gift, purchase, royal grant, and revivification of dead land. Its transmission was by inheritance, gift, and sale (Lambton, 1987:51-3).

Prior to the 1960 land reform, two developments should be regarded as milestones in the changing patterns of land ownership. The 1906 revolution abolished a major feature of land ownership, a system (Tuyul) through which the shah allocated the land on a temporary basis in exchange of services or revenue. This deprived the shah of one of his power bases and paved the way for incoming changes. Another major change was property registration under Reza Shah, which was aimed at the introduction of institutionalized forms of ownership. This trend deprived many peasants of their cultivation rights and helped the landlords, and newly emerging merchants and courtiers, to acquire new rights of ownership through registration.

Commodification of agricultural products was followed by the commodification of land. In urban areas, although exchange of land for money had been practised from long before, the new surpluses of capital and labour resulting from the changes in agriculture found land a marketable commodity. Since the nineteenth century, subsequent waves of monopolization and release of land occurred which intensified this process.

The first transformation of Tehran set the present pattern of dual structure for of the city in which the north and south are distinctively divided. Once established, it expanded on the same bases, somewhat similar to the classic sectoral model of urban structure as developed by Hoyt in 1939. According to this model, "if one sector of the city first develops as a high, medium, or low rental residential area, it will tend to retain that character for long distances". Through the process of city's growth, the sectors extend from the city centre along transportation routes (Hoyt, in Nelson, 1971:79). The emergence of the north-south divide was in the same manner. What sustained this dual structure was the mechanism of land price. This mechanism, based on the commodification of land, has guaranteed the reproduction of social stratification and its spatial manifestation through the creation of barriers to low-income groups. Land price, therefore, institutionalizes the supremacy of the north by
referring to both its physical qualities, such as its better climate, and social qualities, such as the fact that investment on land is potentially higher there.

Land price mechanisms also sustain another spatial relationship: that between core and periphery. As far as this study has shown, Tehran’s urban structure bears a limited resemblance to the earliest classic model as developed by Burgess in 1925 (Scargill, 1979; Herbert & Thomas, 1982). There is a Central Business District in Tehran, the bazaar and its northern extension. There is also a "zone in transition" comprising of areas of residential deterioration resulting from the encroachment of the CBD, exemplified by Oudlajan quarter. There is also a "commuter zone" of dormitory suburbs, such as Shahrak-Qods. Other zones, however, are hardly identifiable, basically due to the social and economic circumstances different from the industrialized countries.

This concentric pattern is supported by urban land theory which assumes that the accessibility differential reflected in land values leads to a competition for sites in the centre (Alonso, 1971), a competition which reflects social and wage stratifications within the society (Harvey, 1989). The second transformation of the city dismantled the parochialist structure of the urban fabric and created a unified space in which the competition was to be eased. The general transformation of the society was on the way to remove the social and physical barriers to this competition.

A pattern which the case of Tehran does not validate is that of intra-urban population density, described as a negative exponential decline of density with distance from the city centre (Korcelli, 1982). Although Tehran has been subjected to de-concentration processes, the north-south divide has created a pattern in which the density in the south, as opposed to the north, increases with distance from the centre. More resemblance, however, is found to Tehran in the third classic model of urban structure, the multiple nuclei model, which was developed by Harris and Ullman in 1945. With the growth of Tehran engulfing the city of Ray and many small settlements, the city has now a number of centres to grow around them.

6.3.2. Monopolization and Release of Urban Land

During the nineteenth century, with the growth of population in Tehran, the suburban land was monopolized by many of the members of royal family and aristocracy who developed large gardens and palaces outside the walls. Most of some 77 small and
medium size rural settlements, which were later incorporated into Tehran's fabric, were owned by the crown and aristocratic landowners (Kariman, 1976:381-449).

The first speculations on land was made by these landowners who supplied their land into a new market in search of profit. They were the main beneficiaries of both stages of transformation of the city in which the city walls, as physical barrier separating their land and property from the urban fabric, were removed.

Through the rising pressure for development as a result of urbanization, these large gardens, together with the rural settlements and their agricultural lands, have been subdivided and sold for development. The pattern which was set in this process was to remain as the main approach to land ownership. In the rapidly changing and unstable circumstances, landowners preferred to capitalize their holdings, by working with, or act as, a developer or by selling it. The owner could commission contractors to develop the land, but did not rent the land to a development agency. The only exceptions to this have been the endowment organizations whose constitution makes them unable to sell their land, which has led to a system of long term leases. An evidence to the relative absence of the rent on land is the very low proportion of cases in which ownership of land and ownership of the building in it are different, only 1.5 per cent in 1984 (MAI, 1986b).

The patterns of ownership and subdivision of these lands, themselves being largely affected by peasants' cultivation rights as well as by topography and water distribution, have played an important role in the patterns of new urban form. Nevertheless, the suburban rural settlements and their lands have constituted a relatively small proportion to the whole urban fabric. Wherever their fabric has survived, they have constituted islands of traditional layout within the new orthogonal road network. The largest of these settlements has been Tajrish in the north with a lively roofed bazaar and several mosques and shrines.

These lands, however, were not sufficient for the land consuming, rapid expansion of the urban fabric. In the early stages of urban development, many of the gardens and villages were still far beyond the city fringes to be of any help in the supply of land. In the later stages, they were gradually incorporated into the urban fabric.
6.3.3. Post-war Speculative Development

After the second world war, the devaluation of currency and inflation which followed the Allies’ occupation of Iran on the one hand, and the lack of opportunity to invest in agriculture and industry on the other, attracted the private sector to consider the land as a profitable asset. Investments were made in urban land for protection against inflation, for present and future stability of capital, and for prospects of secure income. Property development was gaining ground as a result of the growth of urban population and their demand for housing. Because the supply of land is slow to react to the increases in the demand for urban land, it is demand which is the major determinant of property values (Balchin et al, 1988).

Between the end of the second world war and 1960, 25,000 hectares of urban land had been subject to transactions in Tehran, i.e., twice the actual urban land area being 13,300 hectares (Naraghi, 1964:11). This indicated the concentration of speculative activities on land. Due to the existence of a gap between the rate of urban development and the rate of the development of the required infrastructures, the land price in the areas enjoying the latter increased rapidly. From 1940 to 1960, land price in Tehran increased 23 per cent annually, as compared to 12 per cent increase in the price of consumer goods and services (Dezhkam, 1985:200).

The post-war construction boom brought an unprecedented demand for urban land. The uncontrolled, speculative development of the vacant and abandoned land, as well as the land from the gardens and settlements, has been seen as a major determinant of the urban form of Tehran (Naraghi, 1964). Before the introduction of planning system, these lands were freely laid out by landowners or, on their behalf, by estate agents. The size and the form of streets and land plots were largely affected by their decisions. The new form of land plot, which was a determinant of building form as well as street pattern, should be regarded as a "rationalization" of form in order to maximize profit through making this commodity affordable to the newly emerging urban middle class.

To confront the land problem, various measures were taken by the government. The state-owned land was allocated to military and civil servants for housing. Yousefabad, one of the sample quarters of this study in Chapter Two, was an example of this policy. The supplied land, however, due to the limited financial resources of the military and civil servants, could not be developed by them. It entered the heated land market in which the prices were rising sharply.
Abusing the Civil Code, which encourages development by attributing the ownership of land to anyone who develops it, many speculators registered and sold vast suburban areas by pretending to develop them, by planting a few trees or enclosing within walls. This was another wave of monopolization of land followed by speculation on and release of land, which largely set the patterns of urban form.

One measure to solve the problem of land monopolization, which failed mainly due to the 1953 coup, was the 1952 Act on the basis of which the vacant and abandoned land around Tehran belonged to the government and nobody was permitted to register it. The courts which were set up later in the 1950s to reclaim the appropriated land from speculators ended unsuccessfully due to the political influence of the latter. Tax policies and the economic recession of the early 1960s crashed the land market and decreased the price (Dezhkam, 1985).

The land reform of 1962 led the agricultural landowners to invest in urban land speculation. Together with the economic recovery which followed and tax relaxation, the land price once again rose rapidly. The expansion of the city and the high land price provided the grounds for the appropriation of public land by speculators. Even the flood relief channels which protected the city were appropriated and sold. The dimension of this process is best exemplified in that only 35 persons had appropriated about 4 million square metres of relief channels (Dezhkam, 1985:200).

In 1960, the law enabled the government to have the right of compulsory purchase for planning purposes, followed by granting of this right to municipalities in 1968. These rights, however, resulted only in the acquisition of small areas by the government, failing to identify the landowners who were influential enough to block the procedures (VMS, 1981:93).

After the comprehensive plan of Tehran in the 1960s established service boundaries for the city, the land price inside the boundaries increased considerably. It rose more with the increase in oil revenue in the 1970s and subsequent investment in property development. Even the 1975 Act, which prevented more than one transaction on urban land before its development, and various tax policies were not able to check the price. During the space of one year, 1973, the land prices in Tehran-Pars and Majidieh increased 113.2 and 84.1 per cent respectively (Dezhkam, 1985:201). Between 1974 and 1977, land price index in urban areas increased from 100 to 338.6, as compared to
the increase in the price of goods and services from 100 to 160.2 in the same period. At its peak in 1976, land in Tehran reached 250,000 rials (about US$3,570) per square metre, and the proportion of land price to total development cost to 55.4 per cent (VMS, 1981: 89-90).

The high land price led to a rise in housing and commercial rents, generating considerable income spent on luxuries, all helping to increase the inflation. The high rate of profit for investment in land attracted capital from being invested in other sectors of economy. It also had a negative impact on the agricultural development of the surrounding countryside.

Increase in land price prevented large sections of population from access to housing and has accentuated social segregation. It has been detrimental to the development of public facilities and institutions. By reducing the chance of developing green space, which the city is desperately short of, the high land price has been harmful to the environmental quality of this large centre of population. It has encouraged a more intensive use of the land, hence changing the density and the height of buildings, and the patterns of land use (MAI, 1986b; 1985; BMI, 1987; 1986; Farmanfarmaian & Gruen, 1968).

On the verge of the revolution, with the relaxation of the municipal control, the land outside the city boundaries was subdivided and sold to be developed by individuals building their own dwellings. In 1979, the increase of land supply by the large landowners, worried about future uncertainties, and by the revolutionary organization reduced the urban land price dramatically to less than half of the 1977 price (Rafi’i, 1986). The proportion of land price to total development cost in Tehran fell to 41 per cent in 1978 and further down to 25.2 per cent in 1979 (VMS, 1981: 89).

6.3.4. Post-revolutionary Nationalization of Urban Land

The last wave of monopolization and release of the urban land has been carried out by the post-revolutionary government. Whereas before the revolution, the governments’ attempts to curb the land price escalation failed due to their strong support of the large scale private interests, the revolutionary government focused on the redistribution of land ownership (Ghanbari Parsa & Madani Pour, 1988). It aimed at lifting the barriers which the private ownership of vacant urban land created for its supply for development. In addition to the drive for curbing land price inflation, owner-
occupation was encouraged, which was seen as the manifestation of the egalitarian notions of the revolution and the only solution to the acute housing problem (VMS, 1986).

In 1979, transactions on urban land were banned. The policy of Revolutionary Housing Fund was to allocate land widely to low income groups for their housing needs. This was, however, one of causes which led to the intensification of immigration into Tehran. Undermining the planning controls, it gave rise to an uncontrolled growth on the urban fringe in the form of squatter settlements.

As a response to the unwanted consequences of land redistribution, the allocation process was stopped in Tehran. It was followed by the 1979 Act by the Revolutionary Council which nationalized urban vacant and abandoned land to be re-allocated in accordance with comprehensive plans. Within two years, the Urban Land Development Organization, which was set up to operate the Act, was able to allocate 32 million square metres (59 per cent of which was for housing) at low prices in all urban areas (Dezhkam, 1985).

To comply with Islamic laws, the 1981 Act watered down the previous Act by exempting abandoned land from expropriation. It introduced restrictive conditions for allocation, which required the applicants to have been living for ten years in Tehran, to be financially able to develop the allocated land, and to follow the planning regulations (SZS, 1985).

Between 1982 and 1986 in urban areas of Tehran province, a total of 61.9 million square metres of urban land were appropriated, of which 5.9 million square metres were allocated to 35 thousand households (Table 6.15). The discrepancy between the appropriated and the allocated land has created a potential for future allocation. It, however, along with the legal prohibition of land transactions, proved to be crucial in motivating illegal deals.

A new rise in construction activities caused an increase in the demand for land. As against this, supply was limited mainly due to the conflicts in identification and expropriation procedures as well as to the bureaucratization of supply. It led to a rise in land prices, 47 per cent in 1982 and 87 per cent in 1983. In 1983, the average land price in urban areas was 63 per cent higher than 1977 (Rafi’i, 1986). In 1984 it rose...
14.1 per cent in Tehran, constituting 51.3 per cent of the cost of development (BMI, 1986).

Despite the attempts to control the process as much as possible, the high demand for the urban land, which had proved to be a precious commodity in the last decades, led to emphasizing the quantity in the allocation of land. Every available and eligible parcel of land was regarded as a target of the allocation for housing needs. Comprehensive Plan was disregarded as extravagant and outdated. In some areas, the planned open and green spaces were divided and allocated. The public services, due to the financial crisis which made them less viable, were finding smaller shares of land.

The land allocation programme started with the aim of increasing the home ownership of low-income urban population. In the beginning, it claimed to provide free land, a policy which later had to be replaced by selling the land at official fixed prices. The application of official land price, which is several times lower than the real market price, was regarded as a serious concession. The problem for the targeted low-income groups was that they could not afford to both buy the land parcel, whatever the level of concessions, and to develop it. The only available loan by the nationalized banks was for those who owned the land, which the banks regarded as the only guarantee for their money.

This was in sharp contrast with the financial resources of those who were expected to become home-owners. Therefore, at some stage in the bureaucratic procedure of land allocation, which tended to become highly restrictive by adding more and more controls, the applicant had to, often illegally, sell the land. This was a process which was profitable for the original applicant, due to the difference between the market and the official prices, and led to the change of hands from low-income to middle-income groups who could afford to build.

One of the serious problems which the new landowners had to confront was the absence of infrastructures and services, which either prevented them from building or made the life in the area very hard. Between 1982 to 1984, the Urban Land Organization allocated 42 million square metres throughout the country, more than half of which lacked the required infrastructures, making development impractical. According to an estimate in 1986, a maximum of 20 million square metres of these lands were built or under construction (Rafi’i, 1986:23).
Starting from 1985, a scheme was proposed by the Ministry of Housing and Urban Development as a short term solution to the provision of housing in large scales with the objective of reorganizing the public services (Cazerooni, 1988). The scheme, called Land Provision, aimed at preventing the deficiencies and disorders arising from the lack of coordination between different responsible bodies and from the erosion of environmental quality in the development of the allocated lands. Wherever the site was large enough, a master plan had to be prepared by consultants and the required infrastructures were to be supplied by the government (Madani Pour et al, 1987; 1986a; Ardam, 1986).

In 1987, the land provision schemes were prepared in 106 cities in about 14.7 thousand hectares of urban land, which after completion would add about 5 per cent to the built space of these cities. It has been estimated that the present schemes would accommodate 1.5 million people in 340 thousand dwellings. In 1986, the population of the designated cities has been 19.7 million with a growth of 5.4 per cent per year. It has been expected that the land provision schemes, therefore, would be able to accommodate this growth (Cazerooni, 1988).

However, the schemes have been adding new suburban housing estates to the cities on the pattern already at work for several decades, losing the chance to search for new spatial patterns (Madani Pour, 1989a). Even so, the provision of infrastructures and services has proved to be costly and the processes of expropriation and allocation slowed down. A new planning gain policy encourages the large landowners to provide at least a level of infrastructures and public services in exchange for the permission to subdivide and sell their land in the market. This policy, which claims to be profitable for both public and private interests, has been regarded as a further step in the relaxation of the restrictions at times so detrimental to construction industry (Sedaghat Kerdar, 1985).

The impact of the nationalization programme on urban form should be seen through the intensification of urban development which it encouraged. The vacant urban land was rapidly developed, either through appropriation and allocation, or by the landowners themselves. It has largely been responsible to fill the vacant plots in the built-up areas, which had created an inconsistency in the fabric. It has also been responsible for the rapid development of the urban fringes, including those identified in Chapter Two as development areas. Nevertheless, especially in its early stages, the pace of process has
had adverse effects on the quality of environment by undermining the planning regulations.

6.4. Building Materials

Under this heading, the subject of building materials is discussed in the contexts of production and consumption, and their impacts on urban form. The subject of building materials is closely related to technologies of their application. However, for the sake of analytical clarity, the latter has been discussed separately. Nevertheless, there are inevitable overlaps between them.

6.4.1. Production of Building Materials

The production of building materials is carried out by a wide range of production units, from small firms of artisans to large industrialized manufacturers. The smaller, pre-capitalist forms of production use mostly local raw materials, produce traditional building materials, and, with their limited production, are bound to a local market. The large scale producers, like other modern industries of the country are heavily dependent on imported raw materials and machinery, and operate at the scale of national market. At the intermediate level are various forms of production, for example, those who use local raw materials and sell their products at the national level.

This wide range of producers, however, due to the existence of a large market for low quality materials, tend to produce a limited range of building materials, which restricts any diversity in the form and quality of the built space.

In the 1980s, these producers have been capable of supporting annually some 35 to 40 million square metres of construction, apart from the steel and metallic materials whose internal productions suffice only 20 per cent of consumption (VMS, 1981). This figure should be compared to 22.8 million square metres of building completed by the private sector in 1984 (BMI, 1986). The material producers are, however, vulnerable to general political and economic crises, especially the larger producers which are fully integrated into the national and international capitalist economies. The impact of these fluctuations on urban form is revealed in the abundance of some building materials and shortage of others at different intervals. This usually would give rise to pressure for the substitution of more available materials for those in short supply.
Tehran has the largest concentration of production and consumption of building materials in Iran. Between 30 to 50 per cent of the country’s production capacity of building materials is located in Tehran area (VMS, 1981:183). For example, 37 per cent of the annual production of 15 billion bricks has been produced in Tehran. In 1981 and 1982, more than 21 per cent of cement has been distributed in Tehran, equal to the share of nine large provinces (Dezhkam, 1985:185).

Inconsistency between the expansion in the production of building materials and the increasing construction activities has had far reaching impacts on the latter. During the 1970s, this created a serious shortage of building materials which led to a 40.6 per cent annual growth of imports between 1972 and 1977. The shortage of building materials reached a point in 1977 which limited the granting of planning permissions for large buildings (Dezhkam, 1985:194). At some instances, the market prices increased up to 3-4 times that of the official prices (Hafizi, 1980).

The new diversity of building materials, increasingly imported from all around the world, together with the rapid pace of urban development, created a diversity in height and facades and, subsequently a diversity in the townscape. However, due to the cuts in imports and the general shortage of capital and incentives, many of these new developments suffer from lack of maintenance, leaving some buildings in a state of despair.

Resulting from the gap between the demand and supply of cement, Iran changed from an exporter in the 1960s to an importer of cement in the 1970s. With the decline in the construction activities and the expansion of production, however, the import of cement was reduced to reach only 0.8 per cent of consumption in 1982 (Dezhkam, 1985:186-7).

The production of the building materials, like other sections of the economy, has suffered from numerous deficiencies after the advent of revolution and war. Most of the cement and brick production units have been producing far below their nominal capacity. Many of the large production units were, due to their large debts to the banks, nationalized. According to a survey of the managers of the large production units, nearly all of them have had problems in the provision of raw materials, 57 per cent of which were imports. 70 per cent of them have had personnel problems, 70 per cent financial, 30 per cent management, and 25 per cent technical problems (Dezhkam, 1985:192).
In the 1970s, the increase in the demand for building materials, along with inflation resulted from the oil boom, caused a 51.3 per cent price increase between 1974 and 1977. The price increase slowed down during the revolution, e.g. 2.9 per cent in 1978 (VMS,1981), when it again started to rise rapidly since the mid-1980s.

Further rise in the prices was the outcome of a decrease in production levels and the attempts of the revolutionary government to offset this deficiency by controlling the distribution system. The production of the country's 15 cement factories, of which only two had remained in the private hands, reached a black market price of more than three times the official price. It was worse for the steel beams, which were sold at up to five times more.

The gap between the supply and demand of building materials has given the agencies involved in their distribution a more important role in the marketplace. Through profiteering, many of them have been able to influence the patterns of distribution, which was instrumental in distorting the availability of building materials especially for lower classes.

6.4.2. Use of Building Materials

A change in the use of building materials, parallel with the changes of street pattern and building form, has occurred: adobe and wood have almost disappeared and replaced by brick, steel, and concrete.

As the table (6.16) shows, in the four areas under study (which covers the seven sample quarters), there has been a dramatic disappearance of the use of mud bricks, from 21 per cent in older quarters of area 12 to almost none in new quarters. As against this, a significant rise in the use of the burnt brick as the main building material has occurred, from 77 per cent in area 12 to 97 per cent in area 10 (citywide %89). It also shows the reduction in the use of wood, from 42 per cent in older quarters to one per cent in new areas (citywide %7). This decline in the use of wood contrasts the increase in the use of steel, reaching the level of 99 per cent in area 2 (citywide %92). The steel frame and reinforced concrete have also appeared and reached a level of 19 per cent in area 6 (citywide %6).

<table>
<thead>
<tr>
<th>Areas</th>
<th>12</th>
<th>6</th>
<th>10</th>
<th>2</th>
<th>20 Areas of Tehran: No %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total dwellings</td>
<td>49855</td>
<td>61057</td>
<td>53767</td>
<td>51914</td>
<td>938642</td>
</tr>
<tr>
<td>Steel Frame &amp; Reinforced Concrete</td>
<td>537</td>
<td>11633</td>
<td>371</td>
<td>6733</td>
<td>56189</td>
</tr>
<tr>
<td>Steel and Brick</td>
<td>26946</td>
<td>46404</td>
<td>49956</td>
<td>43545</td>
<td>794522</td>
</tr>
<tr>
<td>Steel and Stone</td>
<td>97</td>
<td>2141</td>
<td>197</td>
<td>1030</td>
<td>8534</td>
</tr>
<tr>
<td>Wood and Brick</td>
<td>11825</td>
<td>550</td>
<td>2063</td>
<td>292</td>
<td>41993</td>
</tr>
<tr>
<td>Wood and Stone</td>
<td>27</td>
<td>0</td>
<td>46</td>
<td>0</td>
<td>270</td>
</tr>
<tr>
<td>Concrete Block</td>
<td>10</td>
<td>55</td>
<td>0</td>
<td>40</td>
<td>4043</td>
</tr>
<tr>
<td>Wood</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>30</td>
<td>81</td>
</tr>
<tr>
<td>Wood and Adobe</td>
<td>9201</td>
<td>67</td>
<td>990</td>
<td>19</td>
<td>24659</td>
</tr>
<tr>
<td>Adobe and Mud</td>
<td>1162</td>
<td>72</td>
<td>39</td>
<td>5</td>
<td>2362</td>
</tr>
<tr>
<td>Reed and the like</td>
<td>24</td>
<td>61</td>
<td>40</td>
<td>121</td>
<td>897</td>
</tr>
<tr>
<td>Tent</td>
<td>0</td>
<td>30</td>
<td>0</td>
<td>12</td>
<td>259</td>
</tr>
<tr>
<td>Others</td>
<td>26</td>
<td>41</td>
<td>59</td>
<td>87</td>
<td>4233</td>
</tr>
</tbody>
</table>

Source: MAI, 1981.
Note: The areas mentioned in the table refer to the sample quarters of the Chapter Two. Area 12 includes Oudlajan and Baharestan; area 6 includes Danechqah and Yousefabad; area 10 includes Mortazavi; area 2 includes Shahrara and Shahrak-Qods.


<table>
<thead>
<tr>
<th>Facade Material</th>
<th>Number</th>
<th>Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Covered</td>
<td>4583</td>
<td>31.0</td>
</tr>
<tr>
<td>Fine Brick</td>
<td>701</td>
<td>4.5</td>
</tr>
<tr>
<td>Cement</td>
<td>3014</td>
<td>19.2</td>
</tr>
<tr>
<td>Stone</td>
<td>6933</td>
<td>44.2</td>
</tr>
<tr>
<td>Ceramic</td>
<td>65</td>
<td>0.4</td>
</tr>
<tr>
<td>Glass &amp; Metal</td>
<td>4</td>
<td>*</td>
</tr>
<tr>
<td>Others</td>
<td>100</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Adobe has been the main building material in the old quarters, especially used for the houses, while brick was used from the ancient times in the construction of the major religious and royal buildings and the dwellings of the rich. It has now become the most used material in construction of ordinary buildings.

The widespread use of burnt brick to replace mud brick has been identified as having a wide range of causes (VMS, 1981:167-8). Adobe walls are very thick and require a large number of mud bricks. These bricks are not transportable and need to be produced on the building site. This requires sites with suitable soil for production of mud bricks, which has tended to create difficulties due to the rapid expansion of cities on different kinds of soils. Also, due to the high wages of construction workers, the production of mud bricks and building of thick walls has tended to be more expensive than the use of burnt brick for thinner walls.

Another reason for the replacing of mud brick, which was covered with a mixture of mud and straw, with burnt brick, which has been left uncovered or being covered with stone or cement, is the image of wealth and modernity with which the latter was identified for some time.

Other important issues have been durability and maintenance of mud brick structures. It is true that there are many, centuries-old buildings by mud brick throughout Iran. These buildings, however, are mosques, shrines, water reservoirs, and palaces which are painstakingly constructed in the ways unavailable to ordinary developments. In addition to that, their owners or trustees have been financially able to carry out their maintenance. On the other hand, it is also true that the way burnt brick and steel beams are applied in Iran today is less than perfect. However, structures built in this way are considered to be more durable and stronger than with mud brick.

The issue of durability, especially with frequency of earthquakes in Iran, has continued to be important and, therefore, leading to demand for redevelopment of mud brick structures. Iran's Statistical Centre divides the building materials into "durable", including brick, steel, and concrete; and "nondurable", including adobe, mud, and wood. In these terms, from the dwellings of the urban areas of Tehran province in 1984, 91.3 per cent have been built in durable materials, the highest proportion in the country (MAI, 1986b). The lowest proportion belongs to Gilan province, 7.6 per cent, because of the necessity of using wooden structures in this humid northern province of Iran.
A change occurred in the form and size of the brick (Ardalan, 1986). The traditional brick was a buff-coloured square of 20 by 20 by 4 centimetres, suitable for building domes, vaults, and thick walls. To render possible building of thinner walls and light roofs, a Western standard for brick was adopted, 20 by 7.5 by 10 centimetres.

Until the 1960s, nearly all new buildings in Tehran had brick facades, which created a uniformity and homogeneity in the townscape. Wood and glass were the only materials used in the doors and windows, which were more climatically suitable. From the 1960s onwards, however, a widespread use of stone tiles for the facades and metal windows and doors has dramatically changed the townscape. Stone, mostly travertine, has continued to be widely used. 44.2 per cent of the buildings completed in 1984 had facades covered by stone, as compared to only 4.5 per cent with fine brick (Table 6.17). The latter, however, seems to become increasingly more popular partly due to the stoppage of the import of luxury building materials.

The wide use of materials such as stone and cement to cover the brick structures has been parallel with a decline in the quality of brick in its production. The figure of 31 per cent facades of buildings completed in 1984 being left uncovered, therefore, refers to buildings usually built in low quality brick. This, which tends to have an adverse effect on townscape, is in sharp contrast with the pre-1960s uncovered facades. The latter, due to the better quality of brick, had much more durability and aesthetic values.

Since the distribution of income has already found a spatial manifestation in the north-south divide, the consumption of building materials is also patterned on this basis. The application of building materials found the same spatial manifestation: high quality materials and elaborated facades in the north as distinct from low quality and unsophisticated buildings in the south. The figure of 31 per cent uncovered facades in 1984 is an indicative of how high prices and the shortages of building materials have been crucial in limiting the access of large sections of the population.

The difference in the patterns of production and consumption of building materials has had an effective impact on building form. During the 1980s, due to the shortage of steel, being mostly imported, and availability of cement and brick, there has been a trend towards application of concrete. A comparison of buildings completed with those launched in 1984 shows a 5.4 per cent rise in the use of concrete beams and a 3.3 per
cent rise in concrete frames. This has been against an 11.2 per cent decline in the application of steel beams and only 0.1 per cent rise in steel frame (Table 6.18).

Building materials directly affect building form. There are however, other areas of urban space whose form and characteristics are largely determined by building materials. An example of this is the material which covers the streets. In the nineteenth century, all the streets of Tehran were uncovered. They were dusty but could help reducing the heat by being watered. The first wide streets, which were laid in the 1870s, were cobbled, as were many more in the second restructuring of the city in the 1930s. From then on, asphalt has been the main material to cover the streets. This has dramatically changed the streets’ colour, scene, and climate, especially in the heat of the summer.

6.5. Technology

Technology as a powerful instrument in the development of urban fabric plays a key role in determining its form. This section looks at how the change of technology in transport, defence, irrigation, and construction has resulted in the creation of different forms by the development agencies.

6.5.1. Technological Change

It is important to note that in Iran technological change, like the economic change, has not been an indigenous development. It has been imported from the West. Therefore, it has taken a different pattern from the Western countries in which technological innovation was associated with the expansion of industrialized capitalist production.

Since technological change was not consistent with, and an outcome of, social and economic change, it came to play the role of an exogenous factor. It was transferred into the country as a part of a package which included a wide range of issues, from production patterns to values and life styles. The import of technology has thus created a totally different experience in Iran, creating distortions and shortcomings in its application. It has brought with it certain images of modernity and development. In this form, technological change has helped to increase the dependency of the country upon Western technology and training. As opposed to this, there have been attempts,

<table>
<thead>
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<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>Total</td>
<td>17229</td>
<td>100</td>
</tr>
<tr>
<td>Adobe &amp; Mud</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Concrete Block</td>
<td>14</td>
<td>0.1</td>
</tr>
<tr>
<td>Brick &amp; Wooden Beam</td>
<td>27</td>
<td>0.2</td>
</tr>
<tr>
<td>Brick &amp; Steel Beam</td>
<td>8038</td>
<td>46.7</td>
</tr>
<tr>
<td>Brick &amp; Concrete Beam</td>
<td>4450</td>
<td>25.8</td>
</tr>
<tr>
<td>All Brick</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Steel Frame</td>
<td>3025</td>
<td>17.6</td>
</tr>
<tr>
<td>Concrete Frame</td>
<td>1334</td>
<td>7.7</td>
</tr>
<tr>
<td>Others</td>
<td>341</td>
<td>2.0</td>
</tr>
</tbody>
</table>


### Table 6.19. Imports of Cars, Trucks, and Other Vehicles by non-exempt Importers, 1924-50.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cars</th>
<th>Trucks</th>
<th>Other</th>
<th>Year</th>
<th>Cars</th>
<th>Trucks</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1924</td>
<td>529</td>
<td>103</td>
<td>-</td>
<td>1938</td>
<td>228</td>
<td>590</td>
<td>6</td>
</tr>
<tr>
<td>1925</td>
<td>1,111</td>
<td>492</td>
<td>-</td>
<td>1939</td>
<td>444</td>
<td>99</td>
<td>5</td>
</tr>
<tr>
<td>1926</td>
<td>1,330</td>
<td>967</td>
<td>-</td>
<td>1940</td>
<td>735</td>
<td>327</td>
<td>12</td>
</tr>
<tr>
<td>1927</td>
<td>1,112</td>
<td>977</td>
<td>-</td>
<td>1941</td>
<td>551</td>
<td>845</td>
<td>1</td>
</tr>
<tr>
<td>1928</td>
<td>1,369</td>
<td>1,760</td>
<td>23</td>
<td>1942</td>
<td>89</td>
<td>42</td>
<td>1</td>
</tr>
<tr>
<td>1929</td>
<td>1,529</td>
<td>1,515</td>
<td>10</td>
<td>1943</td>
<td>117</td>
<td>92</td>
<td>4</td>
</tr>
<tr>
<td>1930</td>
<td>566</td>
<td>598</td>
<td>1</td>
<td>1944</td>
<td>78</td>
<td>501</td>
<td>1</td>
</tr>
<tr>
<td>1931</td>
<td>315</td>
<td>570</td>
<td>4</td>
<td>1945</td>
<td>242</td>
<td>2,716</td>
<td>46</td>
</tr>
<tr>
<td>1932</td>
<td>292</td>
<td>627</td>
<td>-</td>
<td>1946</td>
<td>1,058</td>
<td>4,099</td>
<td>131</td>
</tr>
<tr>
<td>1933</td>
<td>617</td>
<td>1,435</td>
<td>9</td>
<td>1947</td>
<td>2,969</td>
<td>2,179</td>
<td>155</td>
</tr>
<tr>
<td>1934</td>
<td>1,325</td>
<td>1,394</td>
<td>31</td>
<td>1948</td>
<td>2,062</td>
<td>1,313</td>
<td>93</td>
</tr>
<tr>
<td>1935</td>
<td>1,317</td>
<td>1,800</td>
<td>20</td>
<td>1949</td>
<td>3,329</td>
<td>2,844</td>
<td>179</td>
</tr>
<tr>
<td>1936</td>
<td>1,047</td>
<td>1,938</td>
<td>41</td>
<td>1950</td>
<td>2,574</td>
<td>2,336</td>
<td>142</td>
</tr>
<tr>
<td>1937</td>
<td>400</td>
<td>1,496</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

especially after the revolution in Iran, to segregate the Western technology from the social and economic contexts which have been instrumental in its development.

Technological change has found different receptions in the Iranian context. Some notions of change, such as the use of motor vehicles, have become common patterns applied by almost all the development agencies in what they produce. There are, however, other areas to which the introduction of change has not become universal. This is especially the case in the construction technology, where traditional, pre-industrial patterns of production have largely persisted.

The widespread application of new technologies in some areas of the production of built environment and its failure to penetrate into others has been consistent with the relative importance of the former to the development of capitalism in the country. One of the most important of these has been transportation with its contribution to the nature of exchange relations. That is why the most important of agencies, the state, tried to create inter- and intra-urban transport networks, with their considerable consequences for urban form. Also important was defence which was a critical criterion for an increasingly centralizing state, which was monopolizing the means of violence. Other areas, such as irrigation or construction technology, which have been considered as less important in this respect, have lagged behind.

6.5.2. Transport

The change in the means and forms of transport might have been the most mentioned reason for change of street pattern, from one based on pedestrian and animal movements to one on motor cars. This technological change has also had crucial implications for the size and the density of the city.

Iran being a major oil producing country, its inhabitants have been able to both buy motor vehicles and have access to cheap fuel. Along with improvement in inter-urban transportation networks, this has been a critical factor in increasing the mobility of population. The demise of the old social structure, which gave rise to more social mobility, with the help of this physical means of mobility, led to a process of concentration of population in urban areas.

In the early phases of rapid urbanization, the incoming population settled mostly in the vicinity of the city centre, hence increasing the density considerably, especially in the
southern areas which received large numbers of immigrants. Nevertheless, the creation of an intra-urban transportation network by the state, and the mobility which was made possible by the use of motor vehicles, spread the urban fabric of Tehran after the second world war. It was due to this ease in movement that the suburban summer retreats were turned into permanent residential areas. The same reason encouraged a growing home ownership and the settling down of a large number of people as far as Karaj, Varamin, and Roudehen in different directions, from which they commute to Tehran. In spite of the rapid increase in the price of petrol and its rationing during the period of war with Iraq, which has had adverse effects on mobility, the urban area is still expanding, mainly relying on the use of private car.

The displacement of wheeled vehicles with camels and other beasts of burden, because of the latter being considerably cheaper, in most of the areas to which Islam spread is well known. It has seemed logical that the circulation system that became the common feature of the cities in these areas would result from entirely different demands in absence of wheeled vehicles (Abu-Lughod, 1983). In Iran, the change of the rectilinear layout of the cities in the ancient period into the organic layout of the Islamic period, of which Tehran is an example, can be seen as an evidence.

Similarly, the increased use of wheeled vehicles, from the nineteenth century onwards, might be seen as one of the prime causes of the demand for wide, cobbled streets. It started with the widening of streets of the royal compound to allow the carriage access and was extended to the urban streets around the citadel. This trend was strengthened with the introduction of motor cars, which became later the almost sole determinant of the street size and form, and was, subsequently, imposed on the whole urban fabric.

Transport found more and more importance with the considerable growth in the size of the city. In the absence of an underground transport system and the inability of the weak public transport to cope with the increasing population of the capital, private car ownership has increased substantially.

As the table (6.19) shows, during the 1930s, in which the streets of Tehran found the form of a transportation network, there has been a rise in the import of cars by private individuals. This is also the case in the post-war period in which the city grew with an unprecedented speed.
The increase in the number of cars has had a direct relationship with the disappearance of narrow streets and cul-de-sacs in the new developments. Even though after the first restructur ing of the city the new wide streets were laid out, the blind alleys were still an inseparable part of the street system. This is best exemplified in Chapter Two by the sample quarters Baharestan, Daneshgah, and Mortazavi. The intra-urban circulation was taking place in the network of the primary and secondary streets. The cul-de-sac was still considered as a desirable semi-public space. Due to the low levels of car ownership, vehicular movement was not yet the universal pattern of access.

After the establishment of the car assembly factories, the number of vehicles rose faster. Whereas before 1924, there were only about 1,000 vehicles in the country (Bharier, 1971:196), their number reached 2.82 million in 1984, of which 57 per cent were private cars (MAI, 1986a:606). Of all the 168 thousand new vehicles in 1984, about 31 per cent were registered in Tehran, indicating the concentration of the motor cars in the capital.

With the increase in the private car ownership, the new developments have been based on the assumption of universal ownership of motor car, which has required the provision of access and parking facilities for all the buildings. This has led to the desire for the creation of a gridiron in which all the streets provide the maximum level of accessibility. The sample quarters of Yousefabad and Shahrara exemplify this new stage.

In the development of Shahrak-Qods quarter, however, this principle of universal accessibility has been challenged while keeping the assumption of universal car ownership. The cul-de-sacs which are here re-introduced, and have proved to be widely popular in many post-revolutionary large developments, have provided the main instrument of this challenge.

The cul-de-sacs, in both old and new forms, in Oudlajan and Shahrak-Qods, have been used to limit and control the access to the buildings. The difference, however, lies in that whereas in the old cul-de-sacs, the minimum required space was allocated to them, the new ones are wide and spacious, which stems from the difference in the means of transportation in these two forms.

Another difference between these two uses of cul-de-sacs lies in their approach towards the relationship between pedestrian and non-pedestrian movements. In the old pattern
of Oudlajan, the routes of pedestrians and the domestic animals they used were the same. Their location in the buildings and even their entrances were separate, but they passed the same thoroughfares and alleys. This has not been the case in Shahrak-Qods, where pedestrian and vehicular routes are designed to be entirely separate. Here, the cul-de-sacs are dead end for vehicles but left open to pedestrians, hence keeping at least a level of accessibility.

This relationship is different in the case of the developments which have taken place in between, i.e, Baharestan, Daneshgah, Mortazavi, Yousefabad, and Shahrara. In these quarters, the sidewalks are separating the pedestrians from the cars, but there is not a strict segregation of the two.

It is, therefore, obvious that the process of introduction of fast, vehicular movement into the urban fabric has been most crucial for the modification of that fabric and introduction of new typologies. From the beginning to use of wheeled vehicles until the widespread use of motor cars, the street pattern has been in gradual change to adapt to new means and forms of transport.

This, however, has resulted in a conflict between the comfort in the use of vehicles and the safety and convenience of pedestrians, which was unknown earlier. The solution to this conflict has been expected to lie in the common sense of the parties involved in the use of urban space, as in the case of most areas of the city, or in the provision of special segregation systems, as in Shahrak-Qods.

6.5.3. Security and Defence

The need for security has historically been a fundamental contributor to the form of cities in a land whose sedentary life was under a constant threat of the nomadic tribes. Many characteristics of the Middle Eastern cities: walls, moats, and gates of the city; walls and gates of segregated quarters; narrow, twisting streets with overhangs and bridges; and introverted buildings whose external face is formed of a blank wall and a gate all seem to have been defensive measures taken against the horse riding invaders (Hourani, 1970; Frye, 1965).

The 1553 walls of Tehran were built to enclose a rising town with a low density. The physical barrier, which the walls created around the settlement, resulted in the development of a high density urban fabric by the second half of the nineteenth
century. The new walls of 1868 lasted only half a century before being removed by the pressure of the urban expansion. From these two walls, the former has certainly had protective uses, whereas the latter’s defensive value, given the defensive technology of the time and the way the walls were built, has been questioned (Curzon, 1892). It was the existence of shells, which could easily destroy the walls, and the general establishment of central government’s authority and monopoly over the means of violence, which caused the final destruction of the walls in the 1930s.

It appears that Tehran never had the walls and gates for the living quarters. The narrow streets and blank facades, however, existed but apparently lost their defensive value with changing circumstances.

Nevertheless, the demand for security survived. At a large scale, the second transformation of Tehran has been seen as partly a defensive measure. Reza Shah, whose accession to throne followed the revolution of 1906, was certainly in need of securing his authority. The fragmentation of the old royal compound, destruction of large areas of the city, such as Sangeladj, and the opening up of other areas, which gave the troops an easy access to these quarters, are examples of this measure.

At the smaller scale of individual buildings, the need for security might be seen in the universal use of walls around the courtyards, and widespread use of the iron bars protecting the outward facing windows, and of the fences installed upon the walls.

6.5.4. Water Distribution System

The pattern of irrigation has been a crucial factor in the form of urban fabric. The impact of irrigation system on form in Persian and Islamic gardens, in which the patterns of irrigation is idealized in their geometry and layout and water is shown as the physical and symbolic source of life, have been studied in great detail (MacDougall & Ettinghausen, 1976; Wilber, 1962).

During the Qajar period, the supply of water to Tehran was entirely by "qanats", whose number gradually increased. The qanat is a system which collects ground water along the descent of terrain and leads it to the settlement and its fields. Typically, it comprises a mother-well, a number of shafts, and an underground aqueduct which connects them. By the 1960s, 34 qanats had survived in Tehran, each with lengths of
usually between five and ten and even as long as twenty four kilometres, bringing water from different directions (De Planhol, 1968:452).

The qanat system originated in Iranian highlands in the first half of the first millennium B.C. and its introduction made many piedmonts habitable (Gaube, 1979). It has had a significant impact on the morphology of settlements in Iran (English, 1966). The subterranean aqueduct appeared on the ground as a canal and was distributed through ditches bordered by plane and poplar trees. So it could effect the location of the social strata: the rich near the mouth of the qanat, where they could use fresh and clean water, and the poor further away.

The form and orientation of the street system of Tehran is clearly influenced by its qanats and canals (Figure 6.1). A number of qanats, mostly from the north and the west, converged in the city and were continued by a distribution system of open canals and ditches by means of gravity. Therefore, the network of streets and alleys which was laid out in the 1930s matched the distribution of water in the city, with the main streets running parallel to the slope and from them branching off the alleys at right angles (Gaube, 1979:6).

With the increase in population, between 1927 and 1930, a 52 kilometres channel was built to bring water from Karaj river in the west. This channel, which forms the northern boundary of the Daneshgah quarter in the studied samples, was distributed in the city on the same pattern of qanats. However, since the development of a pipeline network in the 1950s and construction of a major dam in the 1960s, the importance of the old water distribution system in urban form has almost disappeared.

6.5.5. Construction Techniques

The change in the construction techniques has created a change in the building form, from one storey structures with flat roofs, vaults, and domes to multi-storey structures dominating the skyline.

The mud brick walls, covered by plaster and a mixture of mud and straw, were roofed by wooden beams, reed mats, and layers of a mixture of mud and straw. This old combination was also applied with the use of burnt brick instead of adobe, as might be seen in Oudlajan and Baharestan. In the latter, wooden beams were used to build the
Figure 6.1.
The Old Water Distribution System
newly introduced pitched roof which had been in use in the northern areas of the country and not in Tehran.

With the introduction of steel beams, due to exhaustion of natural resources and deforestation of vast areas of the country, and the structural strength of the steel, they replaced the wooden beams. Again the flat roof was made universal, as in Daneshgah, Mortazavi, Shahrara, and Yousefabad. The steel beams were roofed by brick (Tagh-Zarbi) which was earlier covered by a mixture of mud and straw, as in old buildings, and later found a substitute in a layer of insulation covered with asphalt or mosaics.

The use of brick, steel, and concrete, has allowed the building of higher structures. Recently, the unavailability of steel has led to the use of concrete beams and brick. It is worth noting that in all these changes, the main technique, the use of beams on the load bearing walls has prevailed, and survived to be used in the construction of most buildings. In luxury developments like in Shahrik-Qods, the pitched roof was applied with the help of steel and concrete frameworks.

A construction technique which almost disappeared was the building of domes and vaults, which had been in use for millennia. These were built by mud or burnt bricks in all different kinds of buildings in absence of wooden beams in the more arid parts of Iran (Madani Pour et al, 1986b; 1984). In Oudlajan, this technique has been used but in almost no other quarter has it been applied.

In the drive towards industrialization in the 1960s and 1970s, the industrialization of construction production was introduced. 22 manufacturers of prefabricated buildings were set up with the nominal production capacity of about 2.4 million square metres per annum (Dezhkam, 1985:190). The use of this technique has created large scale developments with repetitive buildings and monotonous facades.

Shortages of building materials has been parallel with the seasons of building activities, i.e., the increase in building activity in the spring and summer and its decline and almost halt in the rainy autumn and the cold, snowy winter. Some studies in Iran have suggested that the industrialization of the building production has the advantage of solving the seasonal nature of the construction industry and its pattern of consumption of building materials. It has also been seen as overcoming the limits of traditional production methods and reducing the labour problems. Its speed and method of mass production are considered as important factors in reducing prices (Dezhkam, 1985).
The prices of the industrialized building systems, however, have been higher than the traditional methods. It has been mainly due to the problems in the organization of production and transportation, shortage of the required skills and building materials, and the selection of unsuitable systems. On the other hand, the traditional techniques have been praised for their availability of materials and human skills which reduces the prices, and their environmental friendliness.

6.6. Conclusion

The pattern which the flow of resources into the built environment takes is of crucial importance for urban form. Surpluses of capital and labour, resulting from the commodification of the countryside, increase in oil revenue, and population growth, were switched into the production of space by the state and financial institutions. The increasing intervention of the state in space, either direct through transformation of physical urban fabric or indirect through channelling the flow of resources, has provided physical and social frameworks to which the private sector has adapted.

The development agencies in the private sector, on the other hand, have been, until recently, largely free of restrictions to operate in the release, development, and exchange of land, to compete for the sites, to intensify the use of land, and to determine its use, all of which are major contributing factors in determining the form of urban fabric.

Also of crucial importance is the pattern of application of the building materials and technology in the physical process of development. It is also shown that how change in technologies of transportation, defence, and irrigation have enabled the development agencies to create new forms.

The patterns of availability, distribution, and consumption of resources have been the main channels to support the physical and social divide of the urban fabric, patterns whose transmutation after the revolution has failed to overcome the divide.

The rationality with which most development agencies have used the resources has often been the instrumental rationality of seeking self interest. Even the public development agencies, which are supposed to operate with a social rationality, seem to have applied an instrumental rationality, rising from the problems of management as well as from the contradictory attitudes of the state. Even the attempts of the
revolution to revive and strengthen the social rationality in the development process, through mechanisms such as nationalization of urban land and control of the distribution of building materials, have not yet produced the expected results.

In a comparison to measure the relative weight of different resources in determining the urban form, it becomes clear that the medium of money, especially its availability patterns, plays the most important role in the deployment of other resources. The major spatial patterns, however, are directly reflected through two resources, land and technology. The other two resources, labour and building materials, are of less importance in having structural impacts on the urban form. The rules and ideas used in the development process, however, as will be discussed in the next chapter, have a different form of impact on the form of urban fabric.
Chapter Seven

DEVELOPMENT FACTORS:
RULES AND IDEAS
This chapter focuses on the planning system, referring to the rules which the development agencies acknowledge, and on concepts of space, referring to the ideas with which development agencies operate. There are also other sets of rules and ideas involved in the development process, which are addressed in the previous chapter through discussions of the resources. Nevertheless, these two headings constitute the most important set of rules and ideas as far as the urban form is concerned.

The planning system is a development factor devised by the state as an instrument to control urban development, hence functioning as a framework for the rest of the agencies. This is a duality in which the development factors, the planning system as well as concepts of space, operate both as instruments of production, used by the development agencies, and as the contexts which frame them.

As explained in the beginning of the previous chapter, the study of these development factors focuses on their impact on general characteristics of urban form rather than on any particular parts of it.

7.1. Planning

The planning system has been one of the main instruments with which the government has tried to affect the course of production of the urban fabric. This section starts with a brief encounter with different forms of planning at the national and urban levels, with an emphasis on the latter. After a look at the urban planning laws, it focuses on urban administration, its organization and evolution, and on urban autonomy and its relationship with urban form. Finally, the Tehran Comprehensive Plan, its approach towards and impact upon form are discussed.

7.1.1. National Planning

The two main categories of planning which are directly involved in the production of built environment are National Development Planning and its spatial manifestation National Spatial Planning. Other forms of planning by different public agencies for various purposes are not referred to here due to their indirect relevance.
7.1.1.1. National Development Planning

The drive for development planning was initiated in 1937 but the first produced plan was for the period 1948-55, which was only implemented for two years due to the nationalization of the oil industry and the subsequent coup. The main strategy of the plan was to encourage agricultural development. 28.6 per cent of public investment was to be made under the title social and urban reforms, of which 25 per cent was devoted to low cost housing and 16.7 per cent to provision of water and electricity (Razzaghi, 1988:167-216).

The second plan, also focused on agriculture, was prepared after the coup for the period 1955-62. This plan heavily concentrated on transportation and communication with nearly 40 per cent of investment, more than 60 per cent of which in road building.

Transportation and communication formed the largest single part of the third plan (26.3 per cent). In this plan, whose period had reduced to five years (1963-67), urban development with 3.5 per cent and construction and housing with 6 per cent of the investments were introduced for the first time as independent categories. The preparation of urban comprehensive plans was launched in the early years of the third plan.

The dramatic change in the fourth plan (1968-72) was that, while its resources were 2.5 times the third plan, it gave the priority to mining and industry, 22.3 per cent as opposed to a major decline in agriculture, from 23.1 per cent in the third plan to 8.1 per cent in the fourth. Now construction and housing found 8.2 per cent and urban development 1.6 per cent of the expenditure. The share of transportation and communication, 14.1 per cent, was less than the third plan, a share which was reduced even further in the fifth plan to 6.8 per cent.

The resources for the fifth plan (1973-77) suddenly increased due to the rise of oil price. In this plan 31.5 per cent of its 6241.3 billion rials credit (as compared to 506.8 billion rials expenditure in the fourth plan) was devoted to defence. The plan proposed an investment of 0.8 per cent in urban development, 3.7 per cent in housing, and 5.1 per cent in government buildings.

The production of development plans has continued after the revolution with a long term 20 year plan and the first 5 year plan for 1983-87. In this plan, which due to the
war has been postponed, 39.5 per cent of the expenditure is made in investment for development as distinct from 60.5 per cent in current expenditure. Urban development has been devoted 0.96 per cent, housing 1.7 per cent, and government buildings 0.88 per cent, and transportation and communication 4.8 per cent of the investment.

As both the pre- and post-revolutionary policies for resource allocation reveal, there has been a general decline in the relative share of urban development in public investment, which explains most of the problems which the planning system has suffered from. However, before the dramatic fall since the mid-1970s, there has been an upward trend towards investment in housing and construction.

The size and scope of development plans have been directly related to the availability of finance, as mostly provided by the oil industry. With higher oil revenues, the development planners have allocated more resources to the production of built environment. The effects on urban form of this pattern of allocation may be seen in the patterns of availability of finance to the producers of space, as discussed in the previous chapter.

7.1.1.2. National Spatial Planning

The 1975 law, which established the Ministry of Housing and Urban Development, asked for a national spatial plan to be produced, the first plan of its kind in the country. Within the framework of national economic aims and objectives, the plan was to set the spatial structure of the country considering the resources and potentials of urban and rural settlements. It had also to take into account the development of the present and future towns and cities, agricultural and industrial poles, tourism and service centres. The plan was required to coordinate the public and private sectors development programmes. Urban plans were to be produced in accordance with the national spatial plan (VMS, 1977). The body responsible for the plan was the Plan and Budget Organization which commissioned a private consultant to produce it (VMS, 1982). After the revolution, the PBO itself has continued the production of the plan.

7.1.2. Urban Planning

In Persian language, the term used for urban planning is "Shahrsazi", city building. In a period when cities and towns have been growing with unprecedented rates, urban
planning has meant to provide the policies for managing this growth. The actual process of urban planning, being carried out by the architect-dominated private consultants, has given planning a strong physical emphasis. Hence, the most visible and direct impact of urban planning on urban form stems from these two considerations: the rapid growth of physical fabric and the perception of town planning as the means to control this growth. This approach has been a continuation of the earlier forms of planning, in the 1870s and 1930s, which aimed at the modification of urban form through physical change, which has continued even after the revolution.

The main characteristics of the process of modern urban planning in Iran has been that forward planning and development control have been carried out by two different, sometimes disconnected, agencies. Whereas the former has been done by the central government agencies and their consultants, the latter has been the responsibility of the municipality. This diversity has inevitably brought about conflicts and disorders. Conflict and disorder also have risen from the diversity of the responsible public sector agencies and the scope of the plans they produce. Whereas the Ministry of Housing and Urban Development and the Town Planning High Council are responsible for the production and approval of comprehensive plans, the Ministry of Interior has been in charge of guide plans for smaller towns, and the Plan and Budget Organization for development and spatial planning at the national scale.

These conflicts, which are built in the centralized system of administration, have continued to exist after the revolution, which was all about negating this system but, in practice, inherited its bureaucratic structure and left its essence almost intact. The conflicts and disorders of the planning system are also built upon a main duality rising from a government willing to promote the private sector and at the same time trying to control it.

The achievements and deficiencies of the planning system gradually came to be known and documented (Mozayeni, 1974; Mantagheh, 1976; VMS, 1977; Clark, 1981). After the revolution, the urban planning in the ex-regime was, both on grounds of policy and implementation, severely criticized (VMS, 1982). The first post-revolutionary reaction in many cases to the comprehensive plans was negative, calling them unacceptable or even opposed to the public interests and the principles of the revolution. For a while, the reactionary atmosphere of the time and the special groups of interest were advocating against planning as a whole. But gradually the benefits of a revised
planning system and the long term undesirable consequences of uncontrolled urban development were appreciated (VMS,1981).

The pre-revolutionary urban planning system might have been manipulated to become beneficial for a small minority who had connections with the court. Nevertheless, its introduction had, to some extent, regulated the urban development process which had found immense dimensions and chaotic consequences. It had put some form of control over the landowners, speculators, and developers, which was beneficial for large sections of the population. It had transformed the urban space according to the social rationality of the incoming capitalist system.

The redesign of the planning process, however, has been halted mainly due to the advent of the Iran-Iraq war. The first development plan after the revolution (VBB,1987a) summarized the structural problems of urban development. These included: the lack of necessary mechanisms to mobilize the non-governmental resources; lack of a comprehensive national and regional planning for housing and urban development which would incorporate urban planning; ambiguities in identification of urban land; and legal contradictions between the agencies involved. Other problems included the weakness of municipalities; the imbalance in the urban system; inefficiency in laws and regulation; and lack of implementation of comprehensive plans.

The policies which the plan adopted for the next five years were, therefore, to provide a long term national and regional spatial plan; updating the comprehensive plans of Tehran and other large cities; reinforcing municipalities from financial, manpower, and management aspects; improvement in public transport; completion and privatization of the half-built buildings; and giving priority to the redevelopment of the old quarters in order to control the urban expansion.

7.1.2.1. Urban Planning Laws

The first modern planning law in Iran, the Law Concerning Building and Widening of Streets and Alleys, was passed in 1933 by the parliament (VMS,1982). In 1941, the 1933 law was revised as the Street Widening Law which was subject to amendments in the 1966 Municipality Law. It was abolished in 1968 when the Urban Development and Redevelopment Law was introduced.
As the title of the early laws show, they were basically produced to ease the process of imposition of the new road networks on the old fabric of the cities. Therefore, in the 1930s, on the basis of the law, the Tehran's municipality, which was run by a general, Karim Bouzarjomehri (Zaka, 1970), was legally enabled to carry out vast redevelopment schemes to build a new transportation network. The new streets had to be wide and the overhangs and bridges to be removed. In addition to the city walls, many Qajar edifices such as the gates and palaces, some of them considered as parts of the cultural heritage, were destroyed. This was a process followed immediately in the major cities and later in the smaller urban areas (Clarke, 1963; Clarke & Clark, 1969).

In the 1966 Municipality Law, for the first time the legal procedure was provided for the formation of the Town Planning High Council and production of land use planning in the form of comprehensive plans. It also introduced a suburban belt which was subject to municipality's development control, and enforced the developers to apply for a planning permission for the developments in the urban areas and the suburban belts.

The Urban Development and Redevelopment Law of 1968 introduced a new real property tax and the procedures through which compensation and betterment were dealt with in the redevelopment schemes. It also enabled the municipalities to practise, according to the comprehensive plans, a strict control over the new developments.

The 1972 Law of Establishment of Town Planning High Council and the 1973 Law of Supervision Over the Expansion of Tehran both were passed to provide legal bases for the planning procedures. In 1974, the Law which changed the name of the Ministry into Housing and Urban Development put forward a clearer definition of comprehensive plans, detailed plans, and guide plans. Its 1976 regulations set the definitions of the city boundaries and the development process in suburban areas.

These planning laws have not determined the detailed regulations concerning the production of comprehensive plans, land division, planning permission, and development control. It has been the consulting engineers responsible for the production of comprehensive plans who usually have proposed the regulations which were legalized after the approval of the plan.

Continuing the line of the earlier planning laws, the later laws were also produced to ease the rapid expansion of the physical fabric of cities and to enable the authorities to
control it. The main theme in urban development schemes was the conflict with the private interest, hence the laws have been essentially centred on this point.

After the revolution, with the decline in the government's authority, this conflict grew especially with reference to Islamic laws which respect the private rights of ownership. The planning authorities had to seek religious leaders' verdict (Fatwa) to enable the government to implement the town planning schemes when these involved in intervention in private property rights.

7.1.2.2. Urban Administration

Until towards the end of the nineteenth century, the cities were run by the governor and his judicial and administrative assistants (Appendix 7.1). An attempt to create a coordinated city management in 1874, in which city assemblies were composed of government officials and distinguished citizens, was aborted a year later when these assemblies were disbanded (Clark, 1981). In line with the first phase of restructuring of Tehran, a municipal institution called "Ehtesabiyeh" was established. It was formed of two departments of "Ehtesab" and "Tanzif". The former dealt with policing and the latter with waste disposal and water distribution (ST, 1985).

The first modern municipality of Tehran, called "Baladiyeh", was set up in 1909 on the basis of a law passed in 1907 by the first parliament after the constitutional revolution (VMS, 1977). According to the law, the city was to be run by an assembly of elected representatives who themselves appointed four persons, including the mayor, to administer the city. The Baladiyeh was responsible for street cleaning, control over distribution and pricing of food, and provision of updated city maps (Mozayeni, 1974). The municipality's sole income was the gate tax charged from the carts and beasts of burden entering the city (ST, 1985).

This first attempt to create an autonomous urban government was only partly implemented. With the accession to the throne of Reza Shah, who suppressed political freedom and built up a strong central government, a new law in 1930 replaced the old one. Now the municipality was an institution entirely dependent on central government. Mayors were installed by the Ministry of Interior and the city councils found the role of advisory groups whose main decisions had to be approved by the Ministry (VMS, 1977:44).
As against this, a move was made towards a more autonomous form of urban government during the period between the exile of Reza Shah in 1941 and the 1953 coup d'état which brought Mohammad Reza Shah back to power. In 1949, a new law on Formation of Municipalities and City Councils was passed by the parliament. According to this law, the mayor was to be chosen by the Ministry of Interior from the candidates introduced by the elected city council (VMS, 1977).

Three years later, this law was amended to provide municipalities with more independence and limit their relationship with the Ministry of Interior. The city councils were allowed to have control over municipalities' financial and administrative affairs. The municipality was required to provide a planning code to which the subdivision of land should comply.

Two years after the 1953 coup, a watered down version of the 1951 law was confirmed as the Municipality Law (VMS, 1977). With major amendments in 1966, this law continued to form the legal basis of municipalities until the revolution of 1979.

In spite of the legal provisions, a considerable level of urban autonomy never came into being. In practice, city councils were rarely formed or, if they did, hardly had a real authority. According to 1966 law, the mayor of Tehran was required to have royal approval. This implied that none of the 30 members of the city council could have an effective control over the mayor who was installed by the Ministry of Interior and was backed by the shah.

The new revolutionary constitution has emphasized once again the creation of city and regional councils. After more than a decade, however, limited as their scope of activity is, the councils are not yet established. The revolution inherited an administrative system which has continued to be essentially centralized.

The organization of the Tehran Municipality has expanded with the expansion of the city. It is now formed of a central municipality and a group of twenty municipalities each in charge of one of the twenty areas of the city. The major constituent parts of its 29.1 billion rials income in 1985 have been real property tax, fines on illegal developments, car tax, driving fines, and gate tax (ST, 1985).

The main parts of the Municipality which deal with urban development are three departments. The Urban Services Department includes offices for planning, urban
services, development, and green space throughout the 20 areas of the city. This Department also includes offices for parks, beautification, vegetable markets, high council for resettlement of squatters (Gowd), opening up of blocked rights of way, and a number of other offices less related to urban space. The Development and Technical Department includes a series of offices for the development and redevelopment and road building. The Urban Transportation Department covers the offices for traffic, terminals, metro, bus, and taxis (ST, 1985).

### 7.1.2.3. Autonomy and Urban Form

There has been many arguments about the absence of urban autonomy in the cities in Islamic lands, which followed the centralized pattern of Byzantine and Sassanian empires, as compared to the communes in medieval Europe which came into being in under-organized states (Cahen, 1970:521). The most essential characteristic of the Islamic city has been seen the looseness of its structure and the absence of corporate municipal institutions, derived from the absence of corporate institutions in general in Islamic society (Stern, 1970). The apparently irregular street pattern of the Islamic city, therefore, is argued to have been closely related to this feature (Eisenstadt & Schachar, 1987).

Islamic cities had fortifications, markets, and, to some extent, corporate institutions, lacking the other two of the five features which Weber (1960) identifies as the main features of an urban community: the autonomous law, due to the fact that Islamic law does not recognize privileges for one group of believers over the others, and the urban autonomy, except in few cases, were absent. The most important social groups whose interests were put forward by Islamic law were family and neighbours, neither state nor province nor city (Schacht, 1970). The Muslim is a citizen of the community of believers, but a mere resident of his town (Von Grunebaum, 1981).

The new forms of city management in Iran show that urban autonomy, in spite of various legal provisions and attempts, has not been achieved. Yet this experience also shows that a complex bureaucratic organization, such as the Tehran Municipality, would be capable of controlling urban physical form without having any real degree of autonomy. Even before any sophistication of municipal institutions, it was possible to create a planned form in Esfahan of the seventeenth century or Tehran of the nineteenth. The inter-war reform of Tehran should also be seen as belonging to this category.
It should be appreciated, however, that different forms of urban government, i.e.,
different degrees of the contribution and participation of the townspeople in the running
of their settlement, might have different impacts on the built form. The experience in
Iran shows how the development of the built environment has suffered from the
absence of public participation (Madani Pour, 1989b; 1988a; 1988b). The evidence
from Tehran, however, clearly implies that, in the creation or modification of urban
form, the existence of ability to control is more crucial than the form from which this
ability has derived its legitimacy. In other words, to constitute a planned urban
development, the presence or absence of autonomy of municipal government has been
less important than the presence or absence of an authority politically and
economically capable of implementing its decisions. This conclusion, however, is
incomplete since it does not enter two important discussions: the relationship between
autonomy and the stability and capability of the authority, and the different nature and
quality of planning in the presence or absence of autonomy.

7.1.2.4. Tehran Comprehensive Plan

Earlier forms of planning in Tehran, in the two phases of its transformations, both
involved physical planning carried out by or with the collaboration of foreign
consultants. The octagonal plan of Tehran in the second half of the nineteenth century
was mainly designed by a Frenchman, General Bohler. The same was true for the inter-
war period of transformation in which German planners were involved. They were
employed by the Technical Bureau of the Ministry of Interior, which prepared plans for
many towns and cities. Foreign planners were also employed for the preparation of the
Tehran Comprehensive Plan (TCP). However, the detailed plan and executive projects
of the TCP have been prepared in the Planning Department of Tehran Municipality.

The rapid, unprecedented, post-war growth of Tehran, in which the population grew
fourfold in twenty years, was mostly carried out by landowners and speculators who
determined the layout and the land use of new developments. The municipality,
however, was not legally and financially capable of interference in this process.

In 1962, the contributors to a seminar on social problems of Tehran asked for an update
map of the city, provision of a comprehensive plan, and reinforcement of the
municipality (Naraghi, 1964; Shur, 1964; Ghaffari, 1964; Behnam, 1964). In 1964, the
preparation of Tehran Comprehensive Plan was jointly commissioned to Aziz
Farmanfarmaian Associates of Iran and Victor Gruen Associates of the United States
under the direction of Fereydun Ghaffari, an Iranian town planner (Ardalan, 1986). The plan was legislatively approved by the government in 1968.

The TCP identified the problems of the city as a high density especially in the city centre, expansion of commercial activities along the main roads, pollution, inefficient infrastructure, widespread unemployment in the poorer areas, and the continuous migration of the low income groups to Tehran. The solution was seen as a modification of the physical, social, and economic fabric of the city (Farmanfarmaian & Gruen, 1968).

The proposals were nevertheless mostly physical, attempting to impose a new order on the existing physical fabric. The envisaged future form of the city was a linear one which, stretching towards the west, reduced the concentration of activities in the city centre. The city would be formed of ten large urban areas each with about half a million population, a commercial and an industrial centre with high rise buildings. Each area (Mantagheh) would be subdivided into a number of subareas (Nahyeh) and neighbourhoods (Mahalleh). The subarea, with about 15-30 thousand population would have a high school and commercial centre and other required facilities. The neighbourhood with its five thousand population would have a primary school and a local commercial centre.

These areas and subareas would be linked through a transportation network whose two main features are a rapid route and a bus route. The stops in the rapid route would be developed as the concentration of activities and a high residential density. The existing city fabric would be subject to redevelopment and improvement schemes which necessitate a decentralization of up to 600,000 of townspeople.

However, this modification of the physical fabric is not extended to social and economic fabric. The present north-south social segregation is not only recognized but also enhanced. The north is meant to be occupied by higher income groups associated with a low density of up to 150 persons per hectare. As opposed to this, the south would be the living place of the low income groups in densities up to 500 persons per hectare. The proposed industrial areas are planned to neighbour low income areas of the south.

The effects of the TCP for the inner areas of the city was the imposition of a blight. The sample quarter, Oudlajan, has been one of the areas which TCP suggested to be entirely
redeveloped. The complexities of land ownership and the financial requirements of such an undertaking made the proposed, large scale redevelopment improbable. Meanwhile, planning permissions for improvement and renewal were refused to be granted. This created a long term blight which led to gradual deterioration of a large and old part of the fabric at the heart of the city (Rahmani & Hafeznia, 1988).

The large scale proposals of TCP proved to be impossible to be implemented. It set, however, planning regulations which, although changed through years, have been most effective in the creation of a new townscape. These regulations have strictly controlled the floor ratio, height of buildings, and their use. The other main concerns with building form have been expressed in restriction on overhangs, open spaces, and parking (ST, 1986).

The essential requirement of devoting at least 40 per cent of a residential land parcel to open space and to take into account the neighbours’ building location have proved to form a certain arrangement of terraces and courtyards. Also the requirement of the provision of parking space within the development has encouraged a widespread application of pilotis in residential areas which has dramatically changed the street scene. In this way, the doors and windows of houses are replaced with the doors and bars of ground floor parkings, depriving the street level of its liveliness and diversity.

After the revolution, the Tehran Comprehensive Plan is asked by the Ministry of Housing and Urban Development to be replaced by a new plan, which is now in the process of preparation. This time, however, the sheer size of the city has urged the authorities to seek a mechanistic solution to the preparation of the plan. They have divided the city into an eastern and a western area and have commissioned two different Iranian private consultants to prepare the new comprehensive plan.

7.1.2.5. City Boundaries

The Tehran Comprehensive Plan which was approved in 1968, determined a 230 square kilometres present service boundary, better known as the 5 Year Boundary (5YB) and the provision for future expansion within a 630 square kilometres 25 Year Boundary (25YB). A hinterland was also accounted for beyond the 25YB. The service boundary was the area in which the municipality was required to provide urban services and infrastructures. It was expected to be revised in five year intervals so that it would expand to reach the 25YB. In order to control the expansion of the city, development was prohibited beyond the 5YB (VMS, 1977; Kariman, 1976).
The second five year boundary, however, was never introduced. It was argued that there was enough undeveloped land within the present boundary. Moreover, the municipality seemed unable to cope with the rising demand of the new developments for infrastructures. This led to an increase in the land price both within and without the SYB and, subsequently, a higher rate of redevelopment, a higher density and traffic congestion, and a reduction of open space.

In 1973, a responsible body formed by a group of cabinet ministers, the Council for Supervision over Expansion of Tehran, was established. The Council was to contain the expansion of the city by controlling the development in the area between 5YB and 25YB. This was expected to put an end to the period in which various and sometimes contradictory decisions were made for the inter-boundary area. Apart from procedural ambiguities, the main shortcomings of the Council were the exclusion of members of the city council from it, as was also the case in the approval of the TCP earlier (VMS,1977). It also disregarded the areas beyond 25YB which were already linked to Tehran to form a metropolitan area.

Initially, the Council blocked any new development in this area. From 1976, however, it agreed to grant permissions for large scale developments: townships larger than 300,000 square metres and residential complexes larger than 30,000 square metres.

The 1973 law asked the municipality to comply with the Council and to destroy any development in this area which would take place illegally. With even faster rates of population growth in Tehran, however, new shanty towns were being built in this area. The destruction of one of these shanty towns, which led to bloodshed, was one of the early events which marked the beginning of the revolution.

The relaxation of the control during the revolution led to an influx of illegal development in the inter-boundary area. Immediately after the revolution, the government was forced to announce the 25YB as the present service boundary in which development through planning permission was allowed. The rate with which these suburban areas developed afterwards during the last decade has been unprecedented indeed.
7.1.2.6. Townships

After the second world war, with increase in mobility and changing pattern of land ownership, many small satellite settlements grew around the cities, constituting one of the major forms of urban development in Tehran and other large cities of Iran. One of the first townships which developed in 1951 was Tehran Pars. These were large dormitory residential complexes without any provision of jobs or local centres. It has only been through passage of time that a high street with some shops and services has evolved in these suburban townships.

The development of these townships was under no form of planning control before the 1966 law which asked for the development process to be based on an agreement from the Ministry of Interior. It was the 1974 law and its 1976 subsequent bye-law which set the rules for this form of development, requiring them to acquire planning permission.

The sample quarters of Shahrara, Yousefabad, and Shahrak-Qods are all examples of these satellite townships which linked to the city afterwards. Each of them, however, represent one form of development. Whereas Shahrara was entirely developed by a developer, Yousefabad’s land was subdivided by the government and developed gradually in small scale developments. It was only Shahrak-Qods which, initiated and owned by a bank belonging to the royal family, was based on planning consent. Yet another form of township which was never built was Shahestan in the north-centre of the city, intended to accommodate an entire new government quarter.

7.1.2.7. Traffic Management

Immediately after the revolution, a new scheme was introduced to confront the worsening traffic jams of the capital. According to this scheme, private cars are not allowed to enter the city centre in the mornings. The traffic precinct is almost similar to the central cluster which the output of the 1986 data classification has shown in Chapter Two. This traffic arrangement has been largely effective in reducing the traffic jams in the city so characteristic of the 1970s. At the same time, it has helped the decentralization, suburbanization, and further deterioration of the central areas.

The planning system, from its rudimentary forms of intervention to transform the urban fabric to the more sophisticated rules and regulations, has had one of the most important impacts upon built form in Tehran. Through the expanding bureaucratic
structure of the Tehran Municipality and through a set of planning laws and the Tehran Comprehensive Plan, it has given rise to new urban forms, physical and social, at all levels. The public development agencies, therefore, have had the most powerful influence upon the urban form in Tehran. This influence has been undermined only during the periods of political instability and during the periods of unprecedented growth of the private sector.

7.2. Concepts of Space

Concepts of space are taken to mean the images of built environment which are the constituent parts of both the aims and instruments of the producers of space. These are images inherited from previous generations or borrowed from other cultures. The first section discusses the images of the West borrowed during the transformation of urban form in Tehran. The second section deals with the socio-spatial patterns which have passed down through generations.

7.2.1. Images of the West

This section looks at how the Western concepts of space have been used in the transformation of Tehran both on objective grounds and as mere images; and thus how these concepts have matched an emerging social and economic system and, at the same time, have become generators of this change. The more distinguishable concepts of space which will be discussed here include those from the Renaissance ideal cities and from the Haussmannian transformation of Paris. They also include the concepts from the inter-war German trends, from the International Congress of Modern Architecture, and from the British new towns.

In the transformation of Tehran after the second half of the nineteenth century, the development agencies were applying, and inspired by, images of Western cities. The encounters with capitalist, industrialized Europe in the nineteenth century, which had started with the military defeat and economic incompetence, was convincing the Iranians to seek to recreate their society in the image of the West.

Before any conscious attempt to transfer the Western concepts of space, however, the society was already on its way to be integrated into the world economy. The transformation of Tehran was indeed a redevelopment of the physical fabric both to
match and to ease the social and economic fabric of the society which was under dramatic changes.

In the process of modernization, the image of the West was sought after as the sign of modernity. It was due to this notion that centuries old concepts of space were abandoned and the Western designers were used both to design the new built environment and to train a new breed of designers.

Concepts of space were only a part of the image which was being produced through borrowing from the West. From the second half of the nineteenth century, along with the Western goods were imported Western ideas and appearances. The European clothes replaced the traditional ones, which were seen as a sign of backwardness, through pressure from the government of Reza Shah. Many institutions of the society, such as army, public administration, schools, and courts underwent this process, imposing new imported structures upon old contexts.

Although during the course of these transformations, strong material bases have supported the borrowed concepts of space, some borrowings were made entirely upon the belief in the importance of imagery. An example of the former case might be seen in the attempts of Nasser al-Din Shah who, with improving the image of Tehran, could hope to secure new loans from abroad. Exemplifying the latter was the use of extroverted house plans and pitched roofs in Tehran. Even though these patterns were common in indigenous forms in the humid northern Iran, their application in Tehran was not derived from a development of the northern forms. These were used in Tehran clearly as an attempt to modernize the townscape along the European lines. Although the use of pitched roof gradually died out through rationalization of construction techniques, it is still being built as a sign of prestige in luxury developments.

7.2.1.1. Ideal Cities of Renaissance

The perfect octagonal shape of Tehran in its first transformation is known to have been mainly designed by General Bohler who was a military teacher in the newly established polytechnic of Dar-al-Fonun. With the implementation of this plan, as well as the construction of new streets and buildings inside the city, started the transformation of Tehran according to Western concepts of space.

General Bohler was a Frenchman who would, naturally, apply what he knew of Western concepts of urban form to Tehran. He is said to have been inspired by the old
fortifications of Paris before the Franco-Prussian war (Barthold, 1984), which had been designed by Vauban (Lockhart, 1960). Vauban was the dominant figure in the military architecture in France and had designed fortifications for many French cities during the late eighteenth century (Lavedan, 1959: 224-8). His typical works: perfect, octagonal, fortified cities, to which the transformed Tehran resembled, recalled the Renaissance ideal cities.

The polygonal, star shaped, massive fortifications of the Renaissance ideal cities (Argan, 1969; Rosenau, 1974) were designed for the new defensive requirements in a time of progressive importance of firearms. The new walls of Tehran, however, were not considered as being of a high defensive value (Curzon, 1892).

The new walls of Tehran were so designed to relate the citadel and the city in a new way. It placed the royal compound in the centre of the city, as distinct from its peripheral location in the previous urban structure. What Tehran shared with Renaissance cities was the rule of a dictator. In the Renaissance city, the apparently perfect political and social arrangement was reflected by the designers in the perfect form of the physical fabric (Argan, 1969).

Far from social and political perfection, Tehran's new walls shared with Renaissance cities a geometric regularity. In the Renaissance cities, this stemmed partly from a concern for exterior, which resulted in the design of buildings and cities being carried out from outside in (Vance, 1977: 227-29). It also stemmed from concepts of symmetry and proportion through revival and interpretation of the classical Vitruvian theory (Argan, 1969). Whereas this concern in the Renaissance period was a part of the revival of ancient approaches to form, in Tehran it was not linked to the ancient Iranian geometric forms. In other words, it was the first in a series of imported concepts to give the city a European image.

7.2.1.2. Transformation of Paris

Many features of the transformation of Tehran recall those of Paris in different times. One of these similarities was the building of wide streets in the place of old walls. In Paris under Louis XIV (1643-1715), the old walls were destroyed and replaced by new boulevards (Couperie, 1970). In Tehran, under Nasser al-Din the walls of the citadel, and under Reza the city walls were pulled down to be substituted by wide avenues.
Nevertheless, the most influential transformation of Paris was that of the Second Empire. The 1868 reform of Tehran was immediately after the period of transformation of Paris by Baron Haussmann under Napoleon III, 1850-70, which set a pattern which was widespread around the world. The presence of the French nationals in the Qajar court and the increased European contacts of Iranians suggest that there should have been an immediate, although limited, impact.

What the 1868 reform of Tehran shared with the transformation of Paris was the enlargement of the city boundaries and the introduction of new streets. In Paris, the old tax boundaries were abolished and the city was enlarged to be divided into twenty "arondissements". This extended the municipality's income from dues paid on consumer goods entering Paris (octroi) (Sutcliffe, 1970). A decade later in Tehran, the extension of the city walls was extending the basis of gate tax which was charged from incoming goods (Curzon, 1892).

The transformation of Paris was essentially in the form of new wide streets cutting through the old fabric of the city. However, the building of new streets in Tehran was small in scale, leaving the old fabric intact. It was more an introduction of a new typology of wide, straight streets, which was a contemporary feature of European cities. In Britain, for example, the concern for public health had led to the demolition of courtyards and building of bye-law houses in straight streets (Bayley, 1975). This concern, however, was not present in the transformation of Tehran due to difference in climatic conditions and the size of urban population.

The pattern of the Chahar-Bagh boulevard from the sixteenth century Esfahan seems to have been of minor influence in the building of new streets in Tehran. Nevertheless, the typology of Safavid squares kept its influence. The new major square of Tehran, Tup-Khaneh, was, like other urban squares since the sixteenth century, inspired by Meydan-e Shah of Esfahan. The latter square pre-dated the Place Royale (Faghih, 1984) which completed in 1615, the first great public square in Paris and the model for squares in London and other Western cities (Vance, 1977:237). The presence of a strong tradition of urban squares, the low level of mobility, and the demand for security resulted in the new streets of Tehran being treated somewhat as the squares, enclosed urban spaces.

Apart from the concepts about the city walls and urban streets and squares, other concepts of space which were borrowed might be traced in architecture of Qajar villas,
which replaced the old courtyard houses (Faghih, 1988), and the landscape design of the aristocratic gardens (Alemi, 1985).

The outcome of the transformation of Tehran in the late 1860s and the 1870s was the beginning of a duality in social and physical morphology, in which new and old coexisted. This stage is portrayed by (later Lord) George Curzon who stated,

"We are in a city which was born and nurtured in the East, but is beginning to clothe itself at a West-End's tailor's. European Tehran has certainly become, or is becoming; but yet, if the distinction can be made intelligible, it is being Europeanised upon Asiatic lines... Though often showy, ... it has not bartered away an originality of which the most modern would not wish to deprive it" (Curzon, 1892:307).

The transformation of Paris by Haussmann had a limited impact on the early reforms of Tehran. It was, however, the second stage of reforms of Tehran in the 1930s which bore more resemblance to it.

Reza Shah and Napoleon III shared in that they both represented the establishment of a far-reaching power after a revolutionary period. Many have attributed the opening up of new streets in Paris as measures to make the military control of working class quarters possible (Chapman & Chapman, 1957). This was also the case with Reza Shah who wanted to safeguard his newly established dynasty against the strong democratic movements of the time.

The street constructions of Reza Shah were very similar to those in the French Second Empire: imposing a degree of geometrical regularity by carving out new streets through densely built areas; concern with monuments and with architectural uniformity in the facades of the new streets; and loss of individuality of different areas which blended into each other (Benevolo, 1980:798). Tehran resembled Paris in treating the urban space as a totality in which a working whole was to be created through interrelationships of different quarters and different functions (Harvey, 1985:74). Both were comprehensive town planning programmes produced within a short period of time.

Benevolo (1980) labels the Paris of Louis-Napoleon and Haussmann as the "post-liberal" city which was superimposed on the earlier city, tending to destroy it. Many characteristics of this city were distinguishable in Tehran of Reza Shah in which the old
city was to disappear through the imposition of the new structures. The interests of landowners were quite clearly privileged and it was them who, especially during the building boom of the post-war period, mostly benefited from the expansion of the city and retained this benefit. In its transformation, Tehran was similar to Paris which had become, "a vast discriminatory apparatus, which confirmed the dominion of the strong over the weak" (Benevolo, 1980:787).

The transformation of the Tehran of Reza Shah shared with that of the Paris of Louis Napoleon which was both a response to processes already in motion, and the framework around which these processes could cluster. The processes were those of industrial and commercial development, of housing investment and residential segregation and so on. In this sense, the shaping of urban space found an active rather than passive role in the urban process. The transformed urban space had a clear effect on improving the capacity for the intra-urban circulation of goods and people. Moreover, it improved the circulation of capital whose surplus, and that of labour, had to be absorbed through large scale public works (Harvey, 1985:76).

The impact of the developments of Paris on Tehran should be seen in the context of a wide range of cultural contacts with the French (Young, 1948). This was a country whose imperial power had never reached the Iranian border, hence being more favourable to the rising tide of nationalism. As regards the concepts of space, these were carried by the French architects who worked in Iran, such as Maxim Siroux and Andre Godard, and the Iranian architects who had studied at the Ecole des Beaux Arts in Paris (Wilber, 1986).

7.2.1.3. German Connections

In addition to the French cultural connection, Reza Shah had developed strong economic ties with Germany, which ultimately led to the Allied occupation of Iran during the second world war. In the inter-war years, German town planners and architects were employed by the Technical Bureau of the Ministry of Interior (VMS, 1982). It is not surprising, therefore, that the redevelopment programmes of the inter-war Europe have been transferred to Iran through these consultants. They were, understandably, conveying the developments in their country from the transformation of central Berlin by Shinkel (Pundt, 1972) to the Bauhaus movement and the neoclassicism of the Nazi Germany. The neoclassical style which was used in Iran, however, was combined with the revival of the ancient Iranian and Islamic
architectural styles (Wilber, 1986). Nevertheless, the interior of these revivalist buildings were designed on the modern Western lines (Lockhart, 1960).

7.2.1.4. Linear City

In the Tehran Comprehensive Plan, given the natural constraints such as mountains and deserts, a linear city was proposed, which was formed of a number of smaller settlements on both sides of the central city (Farmanfarmaian & Gruen, 1968). Centred on the main east-west axis was a gridiron network of roads. After the TCP, a linear administrative centre for Tehran was designed by Llewelyn-Davies who had designed Washington and Milton Keynes new towns in Britain with a gridiron pattern of primary streets (Holley, 1983; Llewelyn-Davies et al, 1966; Walker, 1982; Llewelyn-Davies, 1972).

The idea of linear city, which stemmed from the proposal of Soria Y Mata for Madrid in 1882 and from Tony Garnier's project for an industrial city, was proposed for the reconstruction of London after the second world war (RIBA, 1943). It was applied later in the designs of Cumbernauld and unbuilt Hook new towns (Osborn & Whittick, 1963; London County Council, 1963) and led to numerous debates (Jencks, 1973:355; Llewelyn-Davies, 1972:104; Chermayeff & Tzonis, 1971:225; Chadwick, 1971:121), and a lasting influence (Krier, 1979). The proposed linear form of Tehran by Gruen and Farmanfarmaian was thus relying on this line of development as distinct from the axiality of urban structure which previously had been the case in Iranian cities. Nevertheless, the axis which in reality had evolved in Tehran, and continues to exist as shown in this study, is the north-south axis, as against the proposed east-west axis. This implies another duality rising from an attempt to impose a new structure upon a certain context without taking into account its own potentials.

7.2.1.5. New Towns

The most powerful influence upon the form of the contemporary cities has been regarded as stemmed from the new town and garden city movement on the one hand, and from the Charter of Athens and the International Congress of Modern Architecture on the other (Jacobs & Appleyard, 1987). A strong presence of these influences can be traced in Tehran especially in the post-war development of the city.

The Tehran Comprehensive Plan by Aziz Farmanfarmaian and Victor Gruen was, like many other town planning activities of the time, heavily influenced by the British new
towns movement, which had been of great international interest (Fleming et al., 1984; Von Hertzen & Spreiregen, 1971). Earlier, in his book, The Heart of Our Cities, Gruen (1965) had proposed how the metropolis of tomorrow would be comprised of a central city surrounded by ten cities each with its own centre. This proposal clearly resembled the "social cities" of Ebenezer Howard (1960:142), which was formed of a cluster of garden cities grouped around a central city.

The proposed form of Tehran by the TCP was a linear version of this concept. One aspect of linear design, which the TCP shared with the new towns such as Redditch (Wilson & Womersley, 1966), Runcorn (Ling, 1967), and Irvine (Irvine New Town Corporation, 1971), was the importance of a public transport route as the spine of the town. The stopping points of this route were to become the foci of the surrounding areas with concentration of high density housing and various activities.

Another point which the TCP shared with the new towns was the use of neighbourhood units of limited population focused on a neighbourhood centre and a primary school. This idea had been developed in the 1920s in the United States by Clarence Perry and was based on the catchment area of a primary school (Mumford, 1954; Hall, 1975). It advocated the creation of intimate communities through juxtaposition of a small number of people in physically separated areas. The idea was widely used in the first generation of the British new towns and, after being criticized about its social objectives (Goss, 1961), remained in use as a means of provision of facilities (Schaffer, 1972) and of organization of urban space. In the second generation of new towns, these were called environmental areas, residential districts, and villages. Even though the TCP failed to impose a structure of neighbourhood units on the living city, many new developments in Iran, especially the post-revolutionary designs, have applied the concept in its revised forms.

Another design concept which was used in Iran, in the TCP as well as in Shahrak-Qods and developments after the revolution, was the Radburn idea of superblocks inwardly ramified into cul-de-sacs. Cul-de-sacs had been used in the late nineteenth century design of New Earswick garden suburb by Raymond Unwin (Bayley, 1975:18). Developed in the inter-war period in the United States, the Radburn idea, which was widely used later in new towns, integrated cul-de-sacs into superblocks with central parks to create a separation of pedestrian and car (Stein, 1966). It is again manifest that the use of cul-de-sacs resulted from a transfer of ideas unrelated to a development of
the cul-de-sacs which were a characteristic of the old cities of the Middle East and were so discarded in recent times.

The TCP and later developments used widely the design concepts of the British new towns without pursuing their social objectives. Howard's ideas have been regarded as the midpoint in the line between the nineteenth century utopians and the twentieth century planners (Camhis, 1979:27). He proposed garden cities as a "real path to reform" which would combine the benefits of town and country and be free from the disadvantages of either (Howard, 1960:46-7). The two generations of post-war British new towns (Champion et al, 1977) were planned and developed as alternatives to city overgrowth and congestion and to urban sprawl (Osborn & Whittick, 1963:7). They were proposed to be "self-contained" and socially "balanced" communities for working and living (Cresswell & Thomas, 1973:14). Nevertheless, these two objectives seemed to have remained out of reach: the balanced communities of all classes and ages were not achieved (Wirz, 1975; Cresswell & Thomas, 1973), and self-containment was eroded by increasing mobility and heterogeneity of employment (Aldridge, 1979).

7.2.1.6. Charter of Athens

Another source of influence upon the new emerging urban form was the Charter of Athens. The principles of the Modern Movement, although utilized by individual architects who had studied abroad (Pakdaman, 1983), had not found a wide audience before the early 1960s. At this time, when the disorderly, rapid, post-war growth of Tehran had made its disastrous effects felt, a need for urban planning as advocated by the Charter of Athens started to be emphasized (Moayed, 1964).

Founded in 1928, the International National Congress of Modern Architecture was seeking a more efficacious production of the built environment through "rationalization and standardization". In the Charter of Athens, or the Town Planning Chart, which the Congress produced in 1933, modern planning and modern technology were seen as offering unlimited possibilities for the reconstruction of cities. These were places which faced serious problems in their main four functions: dwelling, recreation, work, and transportation. To solve the problems, land use was to be segregated and workplaces be decentralized. Densely populated districts and their street system, which with their insufficient widths were heritages of the past eras, were to be replaced with high rise residential blocks set in the parks and served by a new access system. Improvement of the street system, by widening or traffic restrictions, and adaptation of new districts to old layouts had proved to have poor results. It was argued that,
"adaptation to the past should not be tolerated in any case". In the implementation of theses ideas, when conflict rose between public and private interest, the latter was to be subordinated to the former (Sert, 1944:242-9).

The inter-war transformation of Tehran shared the anti-traditional attitude of the Charter, both attempting to introduce sharp breaks with the past. In this sense, their means of realizing their objectives was redevelopment. Nevertheless, the prescriptions of the Charter for high rise building did not find any objective ground and hence were not materialized. It was mainly due to the late entry in the capitalist economy, the pre-industrial level of technology, and the rudimentary forms of concentration of people and activities in urban areas. After all, it was not until 1941 that buildings of six and more storeys were being built in Tehran (Wilber, 1986). From the 1960s, however, the government stepped in to encourage the high rise building and urban motorways along with redevelopment. In doing so, the agencies behind these initiatives were largely influenced by the developments in Western cities.

7.2.1.7. Redevelopment

The second world war provided a decisive occasion for the Modern Movement concepts to spread around the world, especially in the European cities whose large parts had been devastated by blitz. In Britain, the urban fabric which was largely a remainder of the polluted and congested industrial cities of Victorian period (Briggs, 1968) was seen as ugly structures to be demolished (Holliday, 1973; Burns, 1963). This was an attitude not dissimilar to that of the Victorians to the Georgian towns (Richards, 1945; Briggs, 1968). Moreover, the inter-war building boom had created urban sprawl and ribbon development (Hall, 1975; Gibson & Lanfstaff, 1982). These issues had caused a concern for re-planning of towns (RIBA, 1943), in order to build a "rationally planned, more egalitarian brave new post-war world" (Ambrose, 1986:36). One of the best examples of this attempt was the Greater London Plan which asked for radical changes in the capital through decentralization of population from the inner areas to satellite towns beyond a green belt along with a network of ring roads and radial arteries (Abercrombie, 1945). These were proposals, some of which were to become standardized principles of planning (Keeble, 1961).

For the post-war generation, redevelopment as a way of re-shaping the cities and towns, which had started from the inter-war period by attacking slums, became the common approach. This was especially the case where apparently two major problems
were faced: traffic congestion and worn out structures. It was argued that, "if we are to have any chance of living at peace with the motor car, we shall need a different sort of city". It was to be a cellular structure consisting of environmental areas set within an interlacing of distributionary highways (Buchanan et al, 1963:41-2). The trust in technology (Crosby, 1967), which was manifest in plug-in cities (Rowe & Koetter, 1978), helped to develop a trend to comprehensive redevelopment to create modernized "total environments" (Gibson & Langstaff, 1982:42). In the older parts of the town centres, any arrangement could be called in question, "the street layout, the general distribution of major uses, even the traditional size or location of the centre" (Ministry of Housing, 1962:2). People who lived in slums were regarded as those with "no initiative or civic pride...satisfied with their miserable environment" whose groupings had to be broken (Burns, 1963:94). Proximity to others was seen as their main desire (Tuan, 1977:63). What replaced the old structures were large scale, high rise office blocks and housing schemes, and supermarkets, the latter reflecting the change in retail industry as well as the modern concepts of space.

From the late 1960s, however, this trend was slowed down and abandoned. It was argued that the change of physical environment had little impact on the values and the pattern of behaviour of their inhabitants (Gans, 1968). Urban motorways and redevelopment schemes were seen as favouring the middle class commuters at the cost of the low income residents of the inner areas (Blowers, 1973) who suffered from dislocation and social disorganization, amongst other things (Clarke, 1973). The high rise housing for low income groups was abandoned due to its costs and social problems (Barnett, 1982) and arguments were made that high density was also achievable by low rise buildings (Martin, 1975). In short, what once had been a "romantic vision of modern technology, freeing individual from tradition" was later considered as being suitable for "mindless bureaucratic repetition, and the cost cutting of profit-motivated entrepreneurs" (Barnett, 1982:8).

From the early 1970s, as a result of an economic crisis and a shift of attitude, the improvement and modernization of the existing fabric replaced the redevelopment approach, the emphasis being put on problems of employment, public transport, and housing (Gibson & Langstaff, 1982; Holliday, 1983). Improvement took the forms of occupiers upgrading and gentrification (Clay, 1979), the latter seen as attracting the suburban middle class back to the city (Bradway Laska & Spain, 1980) in response to an energy crisis (Owens, 1986).
The rising predominance of redevelopment as a way of re-shaping the built environment was transferred to Iran through increasing contacts with the West. From the inter-war period, large sections of urban fabric were subject to redevelopment and imposing of new roads. In the early master plans (Kocks et al., 1961), the old fabrics of the towns were targets of redevelopment schemes meant to bring them into "order". Nevertheless, many of the social objectives of the Western programmes were not taken by the Iranian development agencies, mainly due to the different societal formations. High rise buildings were being built in the north city for housing the middle classes and the urban motorways served the affluent suburbs. In other words, the images were borrowed and not the purposes.

The economic recession in the West which had created a decline in redevelopment schemes, however, was not transferred to Iran with the same vigour, due to the expanding oil economy of the early 1970s. After the extension of the world economic crisis to the country from the mid 1970s and the advent of revolution, a level of improvement in the built environment, as distinct from redevelopment, was practised. Even though the conservation of the old fabrics had been put forward since the 1970s (Falamaki, 1978), the traditionalist attitude of the revolution has hardly reached the built form. Redevelopment has remained as a strong force in the forming of the urban space.

7.2.2. Inherited Concepts of Space

A major feature of the transformation of Tehran, its society and its urban form, is the duality stemming from the juxtaposition of old and new. The gradual, and belated, integration of the economy into capitalism has not been associated with the predominance of capitalist forms of culture, politics, and social norms. In many instances, pre-capitalist, or traditional, norms have resisted and survived, being able to transform the new ones and create synthetic outcomes. In other instances, however, they have been doomed to disappear.

In spite of the fundamental changes that Tehran has undergone, some key social, political, and cultural contexts, which have remained from the past, have continued to practise different levels of impact on urban form. These include the response of certain social strata to the incoming, Western, cultural patterns; the demand for privacy, as reflected in building form; and, to a lesser degree, the importance of the shared cultural, religious, or ethnic background, as reflected in the living places of various groups.
7.2.2.1. Political Authority and Urban Structure

The importance of the monarch in the Iranian politics was such that it is important to concentrate on his actions and positions (Halliday, 1979:54). It was this characteristic of the state, the monarchy, which signified a continuity with the long history of previous rulers, the so-called 2,500 years of imperial rule in Iran. The absolute power of the monarch, his distance from his subjects, and his personal domination over and intervention in the daily affairs were amongst the features which the Pahlavis shared with their predecessors.

The historical continuity of the main political institution, the executive monarchy, suggests that it should have had critical impacts on other social institutions, one of which is the management and spatial arrangement of urban structure. Although the relationship of the institution of monarchy and the urban space has not been yet subjected to any form of analysis, it is possible to trace certain links. This is supported by the presence of some points of similarity between the urban structure of contemporary Tehran and that of the nineteenth century city, namely the existence of the main urban axis leading to the royal quarters. In both cases, the living and working place of the ruler were distinguishably separated from the rest of the population. Also, due to the weight of the ruler in social life of the country, his location in the city was one of the major constituent parts of the urban structure. Other parts were so arranged to find a clear relationship with the royal quarter, hence development of an urban axis which linked the royal quarter with the city and beyond.

7.2.2.1.1. Citadel and City

The main characteristic of the nineteenth century Tehran was the segregation of the citadel from the city, a feature which might be traced back through history to five millennia ago (Appendix 7.2). After the first world war, with the establishment of the strong centralized government, the Iranian city walls were destroyed and the citadels abandoned or redeveloped. Without undermining the advance of destructive firepower which reduced the defensive effectiveness of city walls, their disappearance has been seen as the most tangible expression of discontinuity which occurred in the city with the advent and maturation of capitalism (Giddens, 1981:146-9). The two dominant features of the non-capitalist, class-divided cities were the monopoly of the centre by ceremonial and administrative buildings and the presence of city walls. The city was the dominant power container and its walls represented the physical enclosure of this power. Apart from the economic transformation in land use, the obsolescence of the
walls signified major alterations in the control and deployment of military power. This was made possible by increasing consolidation of the means of violence in the hands of the nation-state which replaced the city as the power container.

The concentration of power in the hands of the state also resulted in a change in the relationship between the government buildings and the rest of the urban fabric. The extension of effective authority over the national territory by the new strong and integrative central government implied the obsolescence of the physically segregated seat of power. The new royal residential quarter which was developed under Reza Shah was not separated by a single wall from the city. As a result of specialization, royal palaces were separated from the military and administrative buildings. The high walls which now enclosed the royal palaces and military bases were not comparable to those of the citadel's. Nevertheless, under the monarchy of Pahlavis (1924-1979) like in the nineteenth century, the seat of the ruler was located on one side of the city, its northernmost area. It was surrounded by the living areas of the higher classes to create a social barrier, rather than a physical one, which separated it from the rest of the city.

7.2.2.1.2. Axiality and Centrality

The city of Tehran in the nineteenth century had an axial structure, a characteristic of the Iranian towns which is traceable at least to the middle of the first millennium B.C. (Appendix 7.3). The twentieth century Tehran, in spite of dramatic social and economic changes and a much larger population, has also an axial structure. In this city, the ruler lived in the northernmost area and a main axis linked him with the rest of the city. Along this axis developed a concentration of many new land uses not unlike a bazaar. Certain aspects of the nineteenth century city, however, disappeared. The fact that the ruler's quarter was not enclosed in a citadel and that the movement was not based on pedestrian scale led to the disappearance of the linking square. Also the sheer size of the city and the use of motor cars, amongst other factors, prohibited the development of a single street as the main axis. It has been rather a group of streets in the north-south direction which have constituted the new axis.

Nevertheless, the continuity in axiality of urban structure signifies the power relations focused on the shah, as the highest authority who was far above any other member of the administration and played a personal key role in most important affairs of the country. The despotic monarchy, which had been in practice for nearly all the history in Iran, in spite of the recent development of capitalist relationships, continued to
dominate the political arena, a contradiction which had to be lifted with the advent of a revolution.

7.2.2.1.3. Intermediate Groups

Another argument which supports the spatial arrangements of axially and centrally is the concept of intermediate agents. Lapidus (1973;1969;1967) has argued that, in Islamic cities, the parochial groups which constituted the society were linked together through intermediate groups such as religious leaders. In spatial terms, this has been reflected by the location of the Friday mosque in the city centre and numerous other mosques and religious institutions in the local centres as the focal points of the urban fabric.

As the layout of the nineteenth century city suggests, the central location of the citadel and the bazaar reveals intermediate roles for economic and political agents as well. The Friday mosque and the bazaar are both the meeting points of the different, and sometimes rival, sections of the society. As for the government, it is true that it practised an absolute power over the people, but it is also true that it had to consider the segregation of these sections and play an intermediate role to be able to rule.

It is this intermediate role of the state which has been reflected in the location of the citadel and the axial structure of the urban space. With the increasing power of the state, its role which was in a form of balance with other intermediate groups changed radically to undermine them. Therefore, if the religious leaders initially lost their intermediary role, the state, as personified by the shah had an increasing importance, hence the reproduction of the axial pattern in an urban structure in which the mosque had no effective importance.

Undermining the religious leaders led to a secularization of urban space, in which religious institutions were not among the favoured new public institutions. As the development of Tehran since the second half of the nineteenth century shows, the number of mosques and other religious buildings declined (Ettehadieh, 1983). Nevertheless, after the Islamic revolution of 1979, the religious leaders regained their powerful social role combined with a political one. This new combination, however, renders it hard to foresee the spatial outcome of the abolition of monarchy and the disappearance of the communal social structure.
7.2.2.2. Islamic Traditions and Urban Form

Urban form of Tehran in the nineteenth century was more or less a typical manifestation of what has been called the Islamic city. The concept of Islamic city was developed by the earlier generations of the students of Middle East, who tried to show how Islam was essentially urban in character (Appendix 7.4) and to explain the Islamic urban form by referring to religious beliefs of Muslims. This view has been challenged on grounds that Islamic city or an Islamic system of city building has never existed if the term refers to "a common set of architectural building blocks generated by a common process and combined according to a common set of rules into a common composite urban pattern" (Abu-Lughod, 1983:64).

There has been identified a cultural diversity in the Islamic countries, which essentially stems from their pre-Islamic traditions and from their different geographical location which has caused continuous contact with neighboring civilizations. It has been argued that this diversity has prevented from the development of a homogeneity and unity in Islamic architecture or urban form and has characterized Islamic culture with a plurality of forms and styles (Kuban, 1983).

Despite the striking diversity, however, there is a remarkable similarity between idioms which recur all around the Islamic areas, and the areas which came under the influence of Islam (Guidoni, 1978), which make them distinguishable from Roman or Hindu cities. These include the street pattern of narrow twisting alleys leading to cul-de-sacs, courtyard houses, bazaars, mosques, and minarets.

7.2.2.2.1. Privacy

The demand for privacy, as enhanced by Islam (Llewellyn, 1983), seems to be a key factor in the organization of space in the Islamic city, as best reflected in the residential cell and in the circulation system.

The demand for privacy is largely consistent with, and inspired by, the pattern of sex segregation. It is, however, true that this pattern has existed in other cultures, with quite different physical expressions. Abu-Lughod (1983), attempts to find the difference between Islamic and Hindu cultures, which both shared this pattern, in their different definitions of female modesty.
The courtyard house is usually seen as an example of the importance of privacy. The house finds an introverted layout centred around a courtyard, which restricts the relationship between the interior and exterior of the dwelling. Having no windows to the street, the house plan, with its twisted entrance, ensures the controlled contact with outside.

The interior of the large houses is also sometimes divided according to the male and female domains. This characteristic, which the nineteenth century Tehran shared with the rest of Islamic lands, stretched back through time, is to be found in many of the houses in Oudlajan quarter.

The principle of privacy led to a threefold organization of space in which private realm was separated from the public by a semi-private realm (Abu-Lughod, 1983). The public realm was the main arteries and the bazaar, mosques, baths, and other public institutions. The semi-private was the blind alley which was merely shared by a few number of houses to which it led. The control of this cul-de-sac, therefore, remained mainly in the hands of its users, and its form, sometimes supported with gates and bridges, discouraged the outsiders from entering to it.

The new house form which emerged after the reforms, was an extroverted one, opening its windows to the streets. The pattern of central courtyard was abandoned. However, the need for privacy survived. Like its predecessor, the new house was enclosed within walls. The court remained the area in which women could move without being seen from outside. The windows to the street were mostly covered with curtains and the balconies left underutilized. In some areas, even the entrance doors were covered, from within the house, by curtains. These forms are mostly found in Baharestan, Mortazavi, and to some extent, Daneshgah.

In the built forms which later emerged, however, privacy found less and less grounds. The use of flats and condominiums meant that a courtyard was to be used by more than one household, especially in the case of the plots with an entrance through the courtyard. The shared courtyard thus lost its previous uses and increasingly became the parking place of the dwellings. In a city with an ever increasing density, multi-occupancy became a common practice in the poor areas of immigrants. Each households lived in a room, as exemplified in some areas of Oudlajan now, with the least levels of privacy and comfort.
Nevertheless, privacy remained as a priority. Since the 1960s and 1970s, the use of pilotis was widespread in the new developments, allowing the ground floor to be used as parking space. This turned to be specifically popular due to the fact that, living in the first floor, provided a protection from the sight for the inhabitants. Examples of this approach may be seen in Yousefabad and Shahrara quarters. It was a clear departure from the emphasis on the street which was predominant in the early transformations, depriving the street level facades from much of their livelihood.

In earlier stages of transformation, cul-de-sacs were still used. The presence of semi-private space in the city, however, reduced dramatically with the gradual disappearance of blind alleys. These were now replaced with streets which were channels of transportation, flanked by building facades. In the later developments, the sense of privacy has been far less than the earlier post-reform areas in which the residue of a distributional access system is at work. The cul-de-sac system has been deliberately used in Shahrak-Qods to recreate the sense of privacy in a semi-public space, which seems to be far less successful.

Nevertheless, as the example of the studied quarters reveals, the need for privacy has found a manifestation in the resistance of the central areas of the superblocks to non-residential uses. This has effectively reduced the level of intrusion by outsiders in these central areas, creating, in some cases, islands of peace and quiet within the disturbing noise of the city. Especially in the case of Oudlajan, the street pattern has been a major barrier to the intrusion, despite the deterioration of the fabric. However, the peace and quiet of the residential areas, although providing a degree of privacy and comfort, seems to be far less than what the old fabric offered, and totally with a different nature.

After the revolution, the demand for privacy in the dwellings was enhanced by planning laws. According to the new regulations, the windows on the northern sides of the buildings which had a potential sight of the neighbouring courtyards were to be built higher than a limit. It has, however, remained largely an unused regulation.

7.2.2.2.2. Prayer

The Islamic prayer is required to be made towards the Qibla, the house of Ka’ba in the holy city of Mecca, i.e, towards southwest of Tehran. This religious regulation has had important implications for building form. Traditionally, the dwellings have been so laid out to face the Qibla, implying that large sections of the urban fabric have had a general orientation towards the southwest and, in absence of detailed measurement, the south.
This has been also strengthened with the climatic desirability of facing south. This general orientation is manifest in the old quarter of Tehran, Oudlajan, as well as in the new quarters.

7.2.2.2.3. External Modesty

The exterior of the house in the nineteenth century Tehran was formed of blank walls pierced only with a portal. Although the portal of a large house was different from that of a small one, they both shared in being relatively modest when compared to their interior. This tendency has continued to exist in the contemporary Tehran, especially within the traditional middle classes. Although the external facades of buildings are now much more elaborated, and they reveal the economic situation of the inhabitants, there has survived a tendency to conceal the wealth of the owners.

A number of different explanations are given for this phenomenon. One viewpoint argues that the sense of religious equality before God, as proclaimed by Islam, has been crucial in determining the interiority of the Muslim city (De Montequin, 1983). The presence of this notion has given rise to a demand for modesty as a sign of respect to the fellow Muslims. Therefore, the interiors are kept invisible to prevent unveiling of the economic affluence or prestigious social status of the owners. However grand the interior of a house or a palace, it finds no reflection in the external facades which are usually blank walls. Contrasting with this viewpoint is the argument that this exterior modesty and interior grandiose could have stemmed from the insecurity felt by the better off resulting from the arbitrary nature of the governments and from fragility of urban life against the threat of nomadic invaders.

Another explanation of this modesty might be the existence of a form of social rationality, a strong sense of conformity to the prevailing social norms, which required a certain extent of modesty. This was predominant in the nineteenth century, as best exemplified by the Oudlajan quarter, and, to a lesser extent, continued to be respected in the twentieth, as reflected in the sample quarters Daneshgah, Mortazavi, and even Yousefabad. Modesty was one of the mechanisms which supported and reproduced the communal bonds which were so essential to the maintaining of the social structure. As against this developed, with the spread of capitalism, an individualism which led to different spatial expression. Now there were some social groups who had broken their ties with the prevalent social norms of modesty and, with the change from introverted to extroverted building forms, found it legitimate to perform their individuality in the
exterior of the buildings they built. This is best reflected in the buildings of the sample quarter Shahrak-Qods.

7.2.2.3. Residential Segregation

Parochiality of social structure in the form of ethnic and religious segregation was a feature of the factionally divided cities of the Middle East (Appendix to Chapter Four). Living quarters were separated by the religion or ethnic origins of their inhabitants. In the nineteenth century Iran, the main factional strife in towns was based on the rivalry between Heidari and Nemati, two Sufi brotherhoods. Their conflict was sometimes draining a town from its livelihood or at least keeping it in a continuous instability (Kasravi, 1983).

This factionalism, however, did not survive the twentieth century spread of capitalism and its associated individualism and integrative nationalism which introduced a new class structure. In the melting pot of Tehran and other large cities, to which people migrated from all over the country, separate sects and groups did not produce any geographical conglomeration at an urban scale. The two sects of Heidari and Nemati faded away, and the different ethnic groups, such as Azeris and Kurds sought new forms of national identity and autonomy at a regional scale. The urban space witnessed another form of conglomeration of groups. This was according to the possession of money which had now increasingly become the basis of social relationships as distinct form the communal bonds. Nevertheless, despite the change in communal structure and nuclearization of family, some spatial manifestations of communal bonds have remained in practice.

7.2.2.3.1. Ethnic and Religious Segregation

In Tehran of the nineteenth century, the living quarters were not physically separated from each other and no formal factional strife existed. The only loosely identifiable geographical segregation was that of the Jewish quarter to the east of Oudlajan. In the twentieth century, however, this quarter has not kept its identity due to the intermingling of various groups in the new living quarters.

Nevertheless, a level of geographical segregation by minority groups has been present throughout this century. Armenians, the largest Christian minority, have tended to dwell in certain new quarters which have eventually found a degree of Armenian identity. These areas, such as Naderi, Bahar, and Majidieh, are now located in the
centre and the north of the city. The living places of other minority groups, such as Afghani and Iraqi refugees and Indians are also somewhat identifiable pockets in the city centre.

None of these segregations have been so as to prevent minority groups from living elsewhere or majority groups from living in these areas, nor that the segregation has been physically expressed, other than, in Armenian quarters, the presence of a church or the casual use of Armenian alphabet.

The main difference of this communal segregation in space with that of the nineteenth century is that now the minority groups are themselves split according to the class structure created by integration to capitalism. Instead of a single concentration of the members of a community, they are now living in relatively small or medium concentrations spread across the city, each accommodating different social strata. This is especially the case with the Armenians, whose large number seems to be another factor in this division.

7.2.2.3.2. Cultural Segregation

The new quarters, which were developed with the rapid expansion of the city, have accommodated mostly the members of the salaried middle class. The modern, Westernized life style of many of these groups was more or less consistent with the physical fabric in which they lived.

The objection of traditional middle classes to the new life styles, which were mostly manifest in the new quarters, has been shown in their reluctance to move into these areas. Some areas of the old city, such as Iran street, which was the host for the incoming leaders of revolution in 1979, are still occupied by traditional classes. Some other areas, however, have gradually lost their status and, due to the high density, congestion, and pollution, have been abandoned by their original inhabitants. In line with this, there has been a migration to specific points in the north, especially to the previously village of Qolhak, which has thus found a traditional character.

Yet by no means this segregation has been embracing all the members of traditional groups. They have been increasingly living in the new quarters, although tending to show preference for their life style by erecting higher walls around their dwellings. With the increasing religious tendencies which were associated with the Islamic
revolution, this practice of building high, light walls seems to have found more appeal, suggesting the emergence of new building forms.

7.2.3. Geometrical Regularity and Rationality

Rectilinearity, as a form of geometrical regularity, was introduced to the physical fabric of Tehran in the two phases of reform in the 1870s and 1930s. This was against the main characteristics of urban form of the immediate past. However, geometrical regularity, in the shape of walls and street patterns, might be traced back in ancient Iranian cities (Appendix 7.5). On the other hand, geometrical regularity seems to have been always present in certain categories of urban buildings, such as palaces, temples, and mosques. This section looks at the presence and absence of geometric regularity in the evolution of urban form to find out about its relationship with the form and extent of concern and willingness of the political authority with the production of urban fabric.

Geometric forms in urban space have been associated with rationality and, hence, planning. On this basis, the urban form of Islamic cities has been criticized as "an anarchic maze" (De Planhol, 1970:454) in sharp contrast with the beautiful orderliness of ancient towns (Cahen, 1970). This has been in line with the criticisms made to the medieval urban form of Europe. Le Corbusier (1971:11) reveals his contempt for the latter in associating it with "pack-donkey’s way". According to him, "Man walks in a straight line because he has a goal and knows where he is going". This is against the pack-donkey which "meanders along, meditates a little in his scatter-brained and distracted fashion". This reflects the difference between the medieval people who accepted the leading of the pack-donkey in their urban forms, and the modern people who strive towards straight lines. "Where the orthogonal is supreme, there can be read the height of a civilization".

On the other hand, it has been argued, that the non-rectilinear spatial forms of the past resulted from the disposition of the units of social and productive organization (family, clan, tribe) rather than by theoretical systems imposed directly onto the structures (Guidoni, 1978:5). The rationality at work here was one which has been described as a conservationist principle which concentrated on the minimum space required (Vance, 1977).
Considering the fact that, throughout history of urban development in Iran, geometric forms have been almost always used in buildings, and only some periods in urban form, it seems hard to believe in the presence of rationality in some periods and its absence in others. If geometric forms are to be taken as a sign of rationality, it is not the presence of rationality which should be doubted. It is the extent of the application of rationality which should be investigated. In other words, the individual arenas have benefited from an instrumental rationality, which seeks self interest, while the public domain has suffered from the absence of a social rationality, which seeks public interest.

On the other hand, it might be possible to refer to geometric form as merely an indicator of some form of order, whether or not rational. This would represent the presence of an authority politically and economically capable of imposing that order over the built space. In this case, the geometric form in single buildings would refer to the presence of an authority in the individual agency's realm. In the case of city walls, whose presence in the first place reflects the presence of power, geometric forms indicate a higher form of authority. When this authority is extended to the internal arrangement of the city, it will be the ultimate representation of authority over the townspeople.

Separation of the order, as the rule established by an authority, from rationality might simply result in a diversity in defining the rationality. In this case, the street pattern of an Islamic city like the nineteenth century Tehran, as the outcome of thousands of small scale consultations and adjustments to reach a collective consensus, might be seen orderly and rational. Indeed, there has been a strong belief that their hierarchical distributional pattern has been the most possible rational solution given the state of economy and technology. However, it would not be a straightforward task to make a judgement between this collective, bottom-up rationality and the top-down one carried out later to impose a new order on the old structures. The dichotomy between these two forms of action implies that none of them have been able to take advantage of the positive dimensions of the other. There are, however, new emerging trends which ask for a model of planning based on democratic debate (Healey, 1989; Healey et al, 1988), a model which would accommodate both these notions.
7.3. Conclusion

Despite the contradictions between private and public interests and the disorder and conflict between the agencies involved, the planning system has been able to practise a fairly effective control over the physical urban forms. Despite the absence of urban autonomy, this has been carried out through a set of planning laws and an expanding municipal bureaucracy associated with the expansion of the state authority. It started with the imposition of road networks on the old fabric, to be followed by the Tehran Comprehensive Plan. These stages facilitated and enhanced the north-south social and physical divide, attempted to create an open urban space, initiated a new street system, encouraged large scale suburbanization and certain building forms, and set the patterns of land use and city boundaries.

The juxtaposition of the inherited and the borrowed concepts of space, therefore, represent as much as stimulate the uneven coexistence of the traditional, pre-capitalist life forms with the modern, capitalist ones, mostly in favour of the latter. The transfer of the concepts of space in the course of transformation of Tehran shows that these have been essentially adopted in accordance with the new, emerging social and economic formation of Iran. At the same time, their implementation has exerted a stimulating effect upon the process of capitalist development of the country. On the other hand, the belated entry of the country into capitalism has implied that many of the initiatives were used as merely prestigious spatial concepts dissociated from their social and economic contexts.

Although the impact of the new concepts of space have undermined the centuries-old concepts used in the production of space, many of the latter have survived. These are basically the concepts which are associated with the continuing life forms and institutions or with a combination of the old and new.

Capitalism, due to its belated arrival, has failed to transform all of the social institutions. The continuation of the monarchy had direct impacts on the reproduction of the segregation of the royal quarters from the rest of the city, albeit in a new way. It also partly caused the re-emergence of a gigantic intraurban axis which led to the royal quarters.

The resistance to and association of different social groups with the incoming change created a cultural duality expressed even in their separated places of living and
working, to be largely lifted only by the passage of time and the revolution. The Islamic traditions and norms of conduct, its demand for privacy and the forms of prayer, have had critical implications which have guaranteed certain points of similarity between the new and old urban fabric. Although ethnic and religious communities were not segregated formally in space any more, they maintained a form of communal spatial manifestation
Chapter Eight

CONCLUSION
Chapter Eight

Chapter Eight

This study has been set up to answer a main question as to why a particular urban form, that arrangement of physical and social milieu, is as it is and also as to how it is likely to change. The study attempted to find the answer by establishing an analytical framework and by applying this framework in a particular case. This concluding chapter will now focus on summarizing the findings of the research about this particular urban form and on the methodological approach used in the research.

The chapter starts with an appraisal of the main proposition of the study. It will be followed by putting forward the answer to the main question of the research in the context of the case study. After that, a brief assessment of the constituent parts of the development process will be given, addressing the relative weight of the development factors, development agencies and their rationalities in the course of action. The chapter concludes with an evaluation of the analytical framework of the research and a brief speculation on the use of this study in the urban design process.

8.1. The Research Proposition

The course of this study has supported the proposition of the research put forward in Introduction. The relationship of the urban form with the general societal processes through the development process has been firmly established.

By tracing the process of development, it has become manifest that the production of urban fabric is an integral part of the general societal processes. It has been shown how the urban form, an outcome of this process, is interwoven into the modifications of these processes and how itself also operates as a generator of change and reproduction of social systems. These points will be elaborated in the following section which proposes the response to the research question.

8.2. Why Tehran's Urban Form is as It is?

Having focused on the case of Tehran, it is now possible to recount the main explanations given throughout the research for the characteristics of its urban form and to try to combine these explanations in one coherent set. It is thus logical to group these explanations under the headings which refer to the main characteristics of urban form as put forward in Chapter Two and, to a lesser extent, in subsequent chapters.
These headings address the size of the city, the north-south and core-periphery dualities of the urban structure, its central axiality and suburban settlements, and also the street system, land use, and building form.

8.2.1. The Size of the City

The first important dimension of the Tehran's urban form which requires to be explained is the size of the city, now accommodating more than six million people in some 570 square kilometres. The main reason for this large size is the rapid and disproportionate growth of Tehran since it became the capital city of Iran two hundred years ago: its population has grown 400 times, its area 142.5 times, and its density 2.8 times. The living place of almost a third of the country's urban population, Tehran is much larger than any of the secondary cities of Iran.

This is explained by the political and economic transformation of Iran during this period, which has caused a considerable change in demographic patterns and its geographical distribution. The transformation process started with the military and economic advancement of the rival international powers of the nineteenth century into Iran. This led to the restructuring of agriculture, the main basis of the economy, to substitute cash crops for subsistence crops, resulting in commodification of agricultural land and produce. The improvements in communication and sanitary conditions were followed by an increased rate of population growth.

Ultimately, the commodification of agriculture, the increase in foreign trade, and the demographic change caused the creation of surpluses of capital and labour to be absorbed in the development of urban areas. These surpluses continued to grow even faster after major developments in the twentieth century, such as the discovery and exploitation of oil, which created an increasingly large revenue, and the land reform, which undermined the old landlords and gave rise to the migration of peasants. The drive for industrialization and the growth of the tertiary sector, which accompanied the blight of agriculture, were among other major factors which made the urban areas the recipients of massive immigration from the rural areas.

Parallel with this economic restructuring, which gradually integrated Iran's economy into the world's capitalist economy, was political centralization. Resulting from the international challenge of the great powers to the sovereignty of the state and from the demand of the emerging capitalist economy to develop regional and national markets,
an increasingly centralizing government emerged. The government, which was an intermediary agency between the rival factions of a parochialist social structure, rose to become the sole dominant force, mostly through the dismantling of those social factions and the opposition and through its monopoly over the main source of revenue, i.e., oil.

The direct outcome of these processes of political centralization and economic transformation was the emergence of Tehran as the largest concentration of wealth and population. It was the seat of this centralized power, the ruler, the army, and the bureaucracy. It was, therefore, capable of extracting the surpluses of capital and labour which resulted from the development of the capitalist production system and which were produced in other parts of the country. A major part of these surpluses were switched into the production of the built environment, hence a growth in the size of the urban fabric and a considerable expansion of the construction industry, both giving rise to further immigration. Through this circular process, there has been a general increase in land prices and, as accompanied by the planning rules and regulations, an intensified use of land and a rising density.

8.2.2. North-South Duality

There is a clear north-south divide in the urban structure in which the northern half of the city, where the middle and upper classes live, is distinguished by a wide range of social and physical privileges over the southern half. The north has tree-lined streets with larger houses, lower densities, higher land prices, smaller households, higher rates of literacy and employment, higher concentrations of modern facilities and amenities, and more green space. Having a more diverse skyline and a visual supremacy over the south, the north enjoys a more moderate climate and is a safer place as regards the floods, underground sewage, and atmospheric pollution. In earlier periods, the privileges of the north included a better water supply and a higher defensive value. Due to these privileges, and enhancing them, was the location of the citadel and, later the palace complexes, in the northernmost areas of the city. The south, however, lies at the opposite end of the spectrum in relation to these characteristics. In short, the affluent north and the poor south are separated by a wide social and physical gap.

This duality has replaced an urban structure in which, with the only exception of the royal compound, rich and poor lived together within four distinctive urban quarters. This was the case before the first transformation of Tehran, which, beginning in 1868,
laid the foundations of a bipolar city by expanding the urban fabric through the addition of new, upper class quarters.

The bipolarity of urban fabric was the spatial manifestation of the emerging social stratification which was associated with the integration of the country into the world capitalist market. The urban structure which developed afterwards followed a sectoral form based on income groups and the difference between the sectors were maintained.

The second transformation of Tehran, in the 1930s, was, like the first transformation, an outcome of this process as well as giving impetus to further social stratification. Both of these phases were carried out by the largest and most powerful development agency, the government, to absorb the surplus of capital and labour which resulted from the restructuring of the economy and to promote development along capitalist lines. The urban fabric was opened up to support the capitalist production system, by easing the movement of capital, goods and services and by increasing the controllability of the townspeople by the centralizing government.

After the establishment of the spatial divide, it has been enhanced and reproduced through activities of the private sector development agencies seeking self interest. This was made possible through a land price mechanism, which guaranteed the reproduction of the social stratification and its spatial manifestation through the creation of barriers to low-income groups. Supporting this was a new planning system devised in the 1960s, and the patterns of distribution of development resources. The factors which prevented large sections of the population from access to land and property and enhanced the spatial divide included: the rising prices of building materials; the higher increase in wages in the construction industry; the rising immigration of the unskilled workers and the skills gap; and the biased policies of the banks and financial institutions towards middle and higher-income groups. This spatial divide has been tightly related to the reproduction of social divide ever since. The supremacy of the north has been institutionalized through its physical qualities, such as its better climate, and through its socially-constructed qualities, such as the fact that the investment on land is potentially higher there.

The widespread use of cars and the opening up of the urban fabric gave a freedom of choice and movement to those who had access to money to segregate themselves from those who were deprived of this access. The former were, therefore, capable of manifesting the geographical expression of a social and economic phenomenon.
This pattern of north-south segregation reflects the wage stratifications of a society in which the relationships are now increasingly defined according to the access of individuals to money, as distinct from the nineteenth century when communal bonds were far more important, as reflected in the factionalism of the social structure and urban space. The communal bonds which made the urban quarters coherent physical and social entities were gradually substituted by the individualism which was the outcome of the increasing prevalence of money economy. This debased the social rationality of the members of these communities to be undermined by the instrumental rationality of the individuals and the special, and much more limited, social rationality which was associated with it.

Nevertheless, some of these communal bonds have survived and have found spatial manifestations, although with diminishing importance as compared to the main segregation pattern. These are reflected in the more or less distinguishable residential areas of the ethnic and religious minorities as well as of the different life styles produced by the clash of capitalism with its predecessor. This created a secular space in the north, in line with the incoming social system, leaving the religious institutions for the south, where the previous social system continued to exist. Also distinguishable are the rural settlements absorbed by the expanding city while retaining many of their characteristics.

8.2.3. Core-Periphery Duality

There is a recognizable difference between the core and periphery of the city. The central areas, comprised of the old city and its northward expansion between 1868 and the second world war, are where most of the business activities and services are concentrated. Next to these areas are the intermediate areas characterized by the prevalence of the residential uses. Enclosing these two are the peripheral areas with their lower densities and rates of activities. The only exception to this concentric pattern has been an increase in density in some southern areas, where the model is modified by the impact of the north-south divide.

This pattern has resulted from three distinct, but interrelated, processes: the historically established character of the central bazaar, the rapid outward expansion of the urban fabric, and the competition for sites within this urban development process.
From 1553, when Tehran was for the first time circumvallated and emerged as a city, to 1868, when these walls were replaced by the new, outlying city walls, the urban fabric had grown slowly, especially before Tehran was selected as the capital in 1786. During this period of growth, the pattern of the central bazaar of the city, as similar to the other cities of the Middle East, was developed. The main commercial and industrial activities were concentrated along the streets of the central bazaar. This created a centrality in urban structure, which was inherited and transformed by the next stages of urban development.

During the second half of the nineteenth century and the first half of the twentieth, the size of the city grew fast. Yet it was the inter-war destruction of the city walls, the improvement in communication, and the increase in the use of vehicles which gave rise to the unprecedented suburbanization after the second world war. This was a process encouraged and supported by the state through its policies of decentralization and growth management.

Being carried out by the private sector development agencies on a speculative basis, most of the post-war, suburban developments failed to focus on any land use other than housing. The pace of urban development was so fast that the public development agencies could not cope with the requirements of the new areas, which explains why so few facilities are found in these dormitory suburbs. This implied that the old city, with its limited facilities, had to provide the services for an ever increasing population. The planning system, with its policy of containment of growth within the five year boundary, also contributed to further concentration of facilities in the centre.

In this context of rapid, outward expansion of physical fabric, the competition between individuals for sites has been introduced mainly through the extension of the capitalist production system to the realm of urban space by the commodification of urban land. Development agencies, increasingly with the purpose of exchange, as distinct from the predominant purpose of use, have been involved in the production of space. In this process, they have been competing for the desirable locations, which has been reflected in the land price mechanism. Their competition for sites was eased by the opening up of the urban fabric, the imposition of the new road system upon the old city, by the public development agencies.

The outcome of this competition has been a concentration of facilities and services in the central areas, enhancing the pattern of the central bazaar in the heart of the city. The
central areas have been desirable for the competing agencies due to their higher level of accessibility and the wider geographical area they serve, as compared to the peripheries which would only provide services at a more local basis.

When added to the previous pattern of the central bazaar, these two processes of outward expansion and the competition for the centrally located sites have resulted in an urban structure which has a distinguishable core-periphery relationship. This also explains the land use pattern of the quarters in the central areas, where economic activities have been rapidly increasing. They have encroached the residential areas, pushing them towards peripheries or containing them inside the centres of superblocks.

Nevertheless, after the initial stages of concentration in the central areas, there has emerged a growing decentralization and suburbanization process, as encouraged by both public and private agencies. This has been through rules and regulations, such as the policies of the Tehran Comprehensive Plan and also the traffic management programmes which aimed at reducing the density and congestion of the central areas. These have been supported by, and leading to, the deterioration of environmental quality in the central areas and the gradual development of peripheral subcentres.

8.2.4. Suburban Settlements

The spread of satellite settlements around the urban fabric is another major characteristic of Tehran’s urban form. It is essentially the general pattern which the process of suburbanization has taken. The main reasons in the development of suburban settlements are the concentration of new urban development in the existing suburban villages and towns and also the pattern of production of new settlements.

The rural settlements around Tehran, which have been engulfed by its expanding fabric or are still standing out of it, are the main nuclei of most of the new suburbs developed through the gradual addition of new built-up areas.

The development of new satellite settlements has been tightly linked to the emerging pattern of capitalist production. The association of the growth in capital accumulation with the growing size of the development agencies has caused a drive towards the production of larger developments in search of larger profits. Whereas the small development agencies are only capable of in-fill development or gradual addition to the urban fringe, the large agencies have been able to produce new towns and townlets.
around the city. They were enabled to undertake these tasks through the increasing availability of credit, as the surplus of oil revenue switched to the construction sector by the banks and financial institutions. The organization of these large development agencies also benefited from the surplus of labour, as provided by the rapid population growth and the blight of agriculture by the government.

In addition to the more formal channels and agencies, informal networks and procedures have been involved in the development of suburban settlements, often squatters or the poor quarters of the south. Their development, however, has been subject to the general dynamics which extract population and wealth from around the country to be concentrated in Tehran.

8.2.5. Axiality

Another characteristic of Tehran's urban structure has been its axiality: there is a central axis linking the south-centre to the northernmost areas, along which most of the facilities and amenities are located and the land prices are at their peak. There is also a secondary, east-west axis which intersects at right angles with the main axis. The major squares along these two main axes of the urban structure are the city's focal points and have the highest land prices. The primary axis is formed of a number of north-south streets, among which a high street, Vali Asr, predominates. Similarly, the secondary axis centres on a single street, Enghelab.

Although there is not enough evidence to find the reasons for this axiality as yet, this study puts forward three main explanations as the bases of further discussions: it is argued that the axiality is the outcome of the combination of the other main characteristics of the urban structure, that it is a result of the historical power relations in the society, and that the axiality of urban structure is an historical concept of space.

The main central axis might be seen as the outcome of a combination of the north-south and the core-periphery relations. The concentric urban structure which results from a core-periphery relationship has been affected here by the north-south divide. The economic and social dominance of the north, as established during the historic process of urban development, has caused a modification of the city centre. The elongated form of the city centre, therefore, has resulted from two sets of formative forces: on the one hand, the old bazaar, the opening up of the urban fabric, and the competition for sites within urban space has intensified the use of central areas. On the other hand, the
northwards movement of the city, which polarized the urban structure, has been parallel with a northwards extension of the city centre.

The divide between the north and south has created a border area, as represented by the secondary axis which is also a major part of the city centre linking the main outgoing roads towards east and west.

The second explanation for the axially is provided by the power relations, namely the relationship between the ruler and the ruled. It is argued that in a society with a millennia old heritage of despotic rule, the position, and hence the location, of the ruler is significant in affecting the urban structure, as best shown by the distinctiveness of the citadel and the city. Along the main route to the seat of the shahs, which started at the main gate of the city, were concentrated the main economic activities, facilities, and services. This implies the intermediary role and the dominance of the ruler in daily life and the attempts of the development agencies to adapt themselves into this framework while aware of other social and economic structures. This has been a characteristic of Tehran both in the nineteenth century and in the twentieth, when, until the Islamic revolution, the dramatic social and economic transformations of the society had left the institution of executive monarchy almost intact.

The third explanation might be seen in close relation to the second. It is another historic precedence for axially, which is traceable at least for twenty five centuries in Iran: the pattern of intersecting main axes leading to four gates on four sides. This is a pattern which, in geometric or irregular forms, has survived in the collective memory throughout the history and has been used in urban forms as well as in gardens and smaller scale developments.

8.2.6. Street System

The change in the street system, from traditional to modern, is another characteristic of Tehran’s urban form. The traditional system, based on pedestrian movement, was a hierarchical distribution pattern of narrow, twisting, partly-roofed streets leading to cul-de-sacs which ended in groups of buildings. The spine of this pattern was a local high street, a bazaar. Upon this pattern, which had evolved over long periods of time according to strong social and environmental rationalities, was imposed an orthogonal network of roads, gradually eliminating the cul-de-sacs. The later introduction of cul-de-sacs has been in association with the vehicular movement.
This change in the street pattern is the major feature of the opening up of the urban fabric to capitalist production patterns. The new concentrations of capital and labour in the city needed to be absorbed and accommodated, a process which commodified the urban space and transformed the former patterns of urban form. The new network was an open matrix which would ease the flow of resources into the urban space. With the change of movement from pedestrian to vehicular, the gridiron was meant to maximize mobility and accessibility, hence the disappearance of the cul-de-sacs. With the introduction of the motor car and the rise in its ownership, the urban form has been transformed to be adapted to this technological innovation which has been increasingly determining the size and pattern of urban streets and squares.

The state, through direct intervention or through the planning system, was capable and willing to tear down the old urban fabric and impose on it new orders. This was carried out through the physical surgery of urban fabric by an increasingly bureaucratic municipal organization which, without any degree of autonomy and in the absence of general democratic procedures, was acting on behalf of the central power. By opening up the urban fabric, which eased the movement of troops, the sovereignty of the government over the people of the capital city was to be secured. It was to create a unified, homogeneous space to overcome the divide between urban quarters and their factionalism, in line with the emerging integrative nationalism. On the other hand, this open matrix was providing a basis on which a new social stratification, as associated with the incoming economic system, could find geographical expression.

The form and orientation of the new street system was rationalized according to natural, technological, economic, and cultural considerations. The topography of Tehran, which is based on a north-south slope, and the earlier water distribution system of qanats and canals, which works with the topography, have set the pattern of a gridiron based on a north-south orientation. This is supported by the desirability of the winter sun in the south, the wind direction across the slope, and the orientation of the prayers towards Mecca in the southwest.

Although rational in these respects, the new street pattern has not found the level of the social and environmental rationality of the old street system. The latter was evolved over long periods of time, taking advantage of the natural environmental qualities of the area and devising a clear relationship between public, semi-public, and private realms, all manifested in the street system. It was based on the disposition of the units.
of social and productive forces as distinct from the imposition of theoretical systems upon the structures. On the other hand, the new urban space has been increasingly rationalized according to the new instrumental rationality which has allowed expressions of the emerging individualism.

The new street system has resulted from a transformation process one of whose major objectives was to focus on creating images of modernity, images of the West borrowed along with the goods, ideas, and appearances. The new forms were borrowed from the Renaissance ideal cities, from the transformations of Paris, from the inter-war developments of Germany, from the Modern Movement in architecture and from the post-war developments in Britain and the USA. These were images to match, to ease, and to generate the new social and economic system which emerged after military defeat and the economic incompetence of Iran in the contacts with the West. Thus the new streets which were imposed upon the old structures were in line with the new social, economic, cultural, and administrative institutions. In borrowing from the West, although approaches such as redevelopment of large parts of the urban fabric was used, some of the main purposes of the original schemes were not followed, mainly due to the difference in the societal circumstances and in the concern for imagery. The concepts of space which were used had, therefore, both material bases in their association with societal processes and conceptual bases in relation to the importance of imagery to signify modernity.

8.2.7. Land Use

In the study of urban form at a more detailed level, the different land use patterns in areas of different age and location were observed. While the mixed use prevails across the city, the residential use is dominant in the peripheral quarters and workplaces in the central quarters. The non-residential use in the old, central quarters is concentrated along the edges, gradually penetrating towards the centre of superblocks where residential use is dominant. Contrasting this, in the new, peripheral quarters, is the development of local high streets in the middle of the quarters, a pattern similar to the structure of old cities and quarters before recent transformations.

This phenomenon may be explained by the general core-periphery relation of the urban structure and by the importance of the new street system. The prevalence of the mixed use, however, is explained by the pace of development and the ways in which it has been encouraged or discouraged.
The mixture of uses, as distinct from the traditional urban structure in which some form of zoning was at work, has emerged as the government encouraged the non-residential uses to spread out of the central bazaar throughout the new street network, giving a new land use pattern in the city. This was mainly due to the political motivation of the state to dismantle the monopoly of the bazaar merchants over the economic space and activities. It was also due to the limited capacity of the bazaar to accommodate new businesses, preventing the competition for the sites in the city. This also stemmed from the rapid development of urban fabric in the absence of any form of communal consensus or an effective planning system. Even when the latter, with its proposals for zoning, was established, the limited powers of municipalities curbed the adequacy of planning control to enforce these proposals, resulting in the development of mixed use areas.

With the increase in the size of the city, the centre has witnessed an expansion of activities. The concentration of the non-residential activities in the central areas of the city, as referred to in the discussion of the core-periphery relations, has been the driving force in the encroachment of these activities into surrounding residential areas. The pattern of land use in the old urban quarters have, therefore, changed to address this process of expansion.

The imposition of the new street system upon the old urban structure and the encouragement of the government that the new street-based businesses compete with the old bazaar-based ones are the main reasons why the edges of these superbiocks are densely accommodating these activities. The hearts of the superbiocks, due to their limited extent of accessibility, have remained residential.

The similarity between the high street of the new peripheral quarters and the local bazaars of the old, pre-transformation urban quarters suggests a similarity between their development process: gradual emergence of a local centre in the middle of the residential areas, where accessibility is higher. These peripheral quarters, due to their location, have not been under a pressure for non-residential development.
8.2.8. Building Form

Parallel with changes in urban space, there has been a change in the building form: from the one or two storey, introverted, courtyard buildings to higher, extroverted buildings, although still enclosed within walled courtyards.

The change in building form has been largely associated with the change in the street system. The explanation lies in the patterns of production and exchange of space, the images involved, and the patterns of continuity which have resisted the change.

The new building form was partly an outcome of the new system of land subdivision, the rationalization and standardization of the size and shape of land parcels which was consistent with the orthogonal blocks and streets. This allowed the emerging urban middle classes to afford housing and landowners and speculators to maximize their profits. The successive waves of monopolization and release of land, by the aristocracy, by the government, and by the speculators, had commodified the land, turning a natural resource into a financial asset.

The increasing availability of finance urged the banks, public and private, and financial institutions, those facilitators of the switch of money from the public to private sector through construction, to encourage the private development agencies to invest in larger scale projects: large housing estates and high rise buildings. The growing size of the development agencies, along with the ever increasing land price, which required a more intensive use of land, and new construction technologies allowed a shift to higher buildings. Although the patterns of production and distribution of building materials, and the patterns of supply of labour into construction industry have caused fluctuations and a decline of quality, they have contributed to the spread of new forms.

The development of the new building form was, like the new street pattern, a part of a package of goods, ideas, and images imported from the West. This has been exemplified in the widespread use of pitched roof for a while which remained in use in luxury developments as a sign of prestige. These images of modernity, however, were confronted by some cultural patterns which have resisted the change. The need for security and privacy, as enhanced by the Islamic traditions, caused the retention of the walled courtyard. The orientation of the buildings was also largely determined by those affecting the orientation of the street system. The facades have been subjected to the availability of the building materials, but the general external modesty of the
buildings have stemmed from a form of social rationality and a need for security. This modesty, however, has been increasingly undermined by the demand for individualism to be spatially expressed.

8.3. The Development Process as a Course of Action

This study has clearly established that the development process is a course of action through which the general societal processes are linked with urban form. This is a process in which all the characteristics of the built environment, including its form, are determined. As shown throughout the study, the agencies involved in the development process have been interacting with the development factors and, through these, with the social and physical contexts. The outcome of these interactions has been the creation of an urban fabric with a particular urban form. Variations in urban form have occurred according to the difference in circumstances, in the rationality with which the action is taken, and in the purpose of the action. The form of the produced fabric, therefore, would have been different if any of the constituent parts of the process were different.

8.3.1. Relative Weight of the Development Agencies

During the course of the production of urban fabric, different development agencies interact and operate within the existing power relations, with the purpose of personal or social gains, which define their rationality. The power frameworks determine the relationships of the agencies with each other and show the degree of involvement and effectiveness of the parties involved.

During the study, it has become manifest that the public sector agencies have always been the most important agencies involved in the production of urban fabric. That is so mainly through monopolization of the main source of finance and the power by the government and through their large scale bureaucratic organization. Through direct intervention in the redevelopment of the urban fabric, or through the establishment of a system of rules and regulations which control it, the public sector agencies have had the most considerable impact on form. By setting up the frameworks, physical such as the road networks, and social such as the rules and ideas with which the resources are being used, the public agencies have determined the fundamental characteristics of form.
Under the impact of the public development agencies, and encouraged by them, are the private development agencies. They are distinguished with their self-promoting purpose, instrumental rationality, smaller size, simpler organization, and more limited access to money and hence to development resources. The built form which these agencies produce is framed by the actions of the public sector agencies, to which they have to adapt. Nevertheless, the relation between the public and private development agencies is more an interaction rather than a unilateral influence. This is due to the multiplicity of the latter’s actions, which makes the sum of these larger than the public actions, and due to the key economic positions of some major private agencies.

The private sector development agencies are involved in a wide range of activities and have different natures, different weights in the process of production, exchange, and use, and hence urban form. The most important agencies, as regards the urban form, have been the landowners who, through their patterns of land supply, especially before the introduction of the planning system, had largely determined the patterns of urban form. Assisting, and employed by, them in setting the pattern of land supply are the consultants, a role which was earlier played, although in a more limited capacity, by the estate agents.

Once the land pattern was established, the most important agencies were the developers engaged in the conversion of the supplied land from one physical form into another for the purpose of use or exchange. Their size, organization, purpose, access to resources, and position towards rules and ideas have become of crucial importance in determining the form of the physical fabric they produce.

8.3.2. Relative Weight of the Development Factors

The relative weight of the development factors is closely linked to the relative weight of the development agencies who interact with them. At the same time it is the control of these factors which determines the relative importance of the agencies involved.

From the development factors studied, as categorized as resources, rules, and ideas, the two resources of land and finance appear to have been the most important resources in the development process. It is the access to finance which often ensures the access to other development resources. Also it is the patterns of subdivision, supply, and use of land which establishes the main features of the urban form.
In spite of the overriding importance of these two, however, the urban fabric will not be produced without the application of other resources. It will be also largely under the influence of the rules and ideas involved in the development process. In this way, the planning system, being under the control of the most important development agency, the state, can be the most significant factor in determining the urban form. Also, given the circumstances, the concepts of space and technology can each be the most important determinant of the form, as can the labour and building materials, although in more limited instances. They all, therefore, constitute a combination in which the characteristics of each development factor, and its stake in the development process, are tightly linked to those of the other development factors. In different circumstances, each one of these interwoven elements of the combination can become the primary determinant of urban form without being free from the influence of the others.

8.3.3. Development Process and Rationality

The development process is undertaken by the agencies who have different natures, purposes, and interests. As the course of the study has shown, the development agencies have acted often rationally according to these frameworks. It has been shown that, in addition to the modification of these frameworks by the incoming capitalist social and economic system, the rationality with which the action has been taken has changed.

The study has introduced the concept of competing rationalities as an outcome of a change from pre-capitalist to capitalist systems in Iran. Social rationality seemed to be prevalent in the former system, mainly due to the parochialist social and economic structure and the strength of communal bonds. According to this model of rationality, the interest of the community was to be put above the interest of the individual. Inherent in this, and in the general circumstances of the time, was an environmental rationality which respected both the natural and built environments and regarded them as the contexts to which adaptation should be made. The development process which was based on these rationalities, slowly and in an evolutionary way, led to the creation of a distinctive urban form which is distinguished from its successor by its emphasis on communities rather than on individuals.

With the social modification which undermined the communal structure of society and its associated social rationality, the rationality which emerged was instrumental, one focused on the interests of individuals. The individualism which the capitalist system
brought was the underlying cause of this new rationality. The development process which was based on this rationality created an urban form in which the social interests were increasingly undermined. The new form of social rationality which emerged, as advocated and maintained by the state and its planning system, was based on the attempt to give some form of order to the proliferation of instrumentally rational actions of the individuals and organizations. This has also been an attempt to decommodify some parts of the urban space after it had been commodified rapidly.

8.4. Evaluation of the Analytical Framework of the Research

The analytical framework devised to carry out this study, and the methodology developed on that basis, have been founded on four interrelated notions. Firstly, it should be acknowledged that urban form has both physical and social dimensions and that any study of urban form should address both these dimensions. Secondly, since the urban fabric is the outcome of an historic creation process, the study of urban form is best undertaken by tracing the development process in which the urban fabric and its form are created. Thirdly, that the development process is a social process best understood through the study of the interaction of agencies and structures of social, and physical, systems. Fourthly, that any particular configuration of urban form is determined by variations in these component parts of the development process and their interrelationships.

The component parts of the development process are identified as development agencies, interacting with development factors in certain social and physical contexts. The development factors are those resources, rules, and ideas which are the structural properties of the social system engaged in the production of space. The physical and social contexts are those environments of which the development process and its product are the constituent parts. In this study, the development factors have been identified as finance, land, labour, building materials, and technology as the resources, the planning system as the rules, and the concepts of space as the ideas involved. The development agencies are identified as the ministries and municipalities in the public sector. The private sector agencies include the landowners, developers, estate agents, banks, financial institutions, housing cooperations, building materials manufacturers and retailers, consultants, and contractors. The contexts are identified as the social environment and the physical environment, the latter addressing both the natural environment and the built environment.
In short, the study is based on the acknowledgement of a need for a study of the development process as a course of action taken place in a certain context, in which the interaction between agency and structure produces an urban fabric in its physical and social forms. Any evaluation of this framework will need to investigate if it has been successful in addressing the study of the selected case and if it would be appropriate to be applied in other contexts.

The present study has shown that its methodological approach, based on the analytical framework developed for the research, has been capable of addressing the research question and of establishing an approach to the study of urban form. The evidence which supports this is that it has enabled the research to have a meaningful perspective of a wide range of phenomena each of which are a part of the urban process. In this perspective, the dangers of reductionism and determinism have been largely reduced by acknowledging the correlation between the phenomena which at times seem unrelated. This is best exemplified in the analysis of the development agencies and factors. Here it is shown how there are different dimensions to be taken into account in the same course of action. These are the component parts of the development process entering into an interaction process which results in the production of urban fabric and its form. Yet it is shown that no single dimension is capable of accounting for the produced form without addressing the involvement of other dimensions.

It might be argued that this meaningful perspective provides little more than a way to structure the study of the case, and that this can be arranged in a variety of different other forms. As against this view, it can be argued that what is here offered as an analytical framework is essentially a different way of looking at the subject from a different angle, which provides an insight into the way urban form is being evolved.

It might be said that the offered viewpoint is based on a common sensical wisdom of trying to have an approach which takes into consideration the different dimensions of a phenomenon to understand it. The answer to this criticism is that if such a wisdom is considered as the common sense, certainly it has not yet been extended to the study of urban form. As shown by the review of other approaches to urban form, these approaches are often accounting for some aspects of urban form, failing to address the question of this research which seeks wider perspectives for the understanding of form.

It might be said that this analytical framework is not new since most of the approaches to urban form have some form of evolutionary viewpoint based on the development of
the fabric. This can be counter-argued in that, despite the existence of this implicit assumption in other approaches, very few have focused on the development process as a multi-dimensional course of action.

It might be said that this approach is not, as it claims, multi-dimensional since it fails to address issues such as the dynamics of the design process. The response to this criticism is that the claim to multi-dimensionality does not imply to be inclusive of every possible consideration. Since the intention of the study has been to focus on the links between urban form and societal processes, the social, rather than individual, aspects of actions have been often dealt with, hence bypassing the subjectivities of designers as active agents in the production of form. Furthermore, the discussions on the design, for example, are largely referred through the discussions on the concepts of space.

It might be said that the proposed analytical framework could be elaborated further to address issues at more detailed levels of study. This argument can be counterposed with the view that any set of ideas which tries to relate the general and specific sides of a spectrum might become too restrictive and rigid in its approach towards the explanation of a social process. It should be argued that the framework in its present form provides a degree of flexibility required in its application in other contexts. It should be further argued that any further elaboration of the conceptual framework in the context of this study would be endangered by being too tied to a single case. It needs to be extended by its application in other cases.

The main barrier which limits the generalizations which may be drawn from this study is that it has embarked upon the study of a single case. It might be argued that, by having focused on more than one case, more generalizable points would have resulted. The counter-argument to this is that this study has dealt with its subject in a considerable depth and detail. This is a stage hardly approachable in the comparative studies which would have been carried out in the limited available time of this research and in the limited capacity of a single person. Any such study would have been forced to deal with fewer considerations, hence resulting in a more limited conclusion, as opposed to what could have been expected. It should be argued that any further research in other contexts based on this analytical framework would require to be separately carried out to be able to deal with the same range of considerations and the same depth.
Yet the detail and variety of the considerations which this study has taken into account might provide the grounds for a criticism. It might be said that fewer considerations would have been more ideal for a more controlled study. The answer to this argument is that, firstly, the intention of the study has been to investigate the link between the general societal processes and the urban form, hence the need to draw upon a wide perspective to set the urban form within its wider contexts. Secondly, the study of the selected case was one which could not rely on the available analytical materials, due to the relative absence of such materials, hence the need to investigate a wide range of issues. Many of these issues are here presented in considerably summarized forms or are concentrated in the appendices.

Although this evaluation supports the analytical framework of the study, it should be acknowledged that it is not meant to be conclusive. It needs to be tested in other contexts to prove its capacity to deal with the studies of urban form and to be enriched and improved accordingly. Even so, it should be admitted that this is only one way of approaching the subject. Although it has enabled the research to find a response to a complex question, it is by no means the only acceptable way.

8.5. Some Speculations on the Use of this Study in Urban Design

There has remained one major question to be addressed: how the findings of this research could be used in the process of urban design? This is a question which requires a separate, extensive research. Nevertheless, few attempts will be made here to speculate on the subject as a stepping stone towards that research project.

The main interest of the designers being the design of the physical fabric, they have often been accused of neglecting social and economic dimensions of the context in which they work. Most of the books on urban design seem to be manuals or history books, failing to provide a conceptual framework with which urban designers can identify themselves and work within. Any attempt to provide such frameworks will require a better understanding of the process in which urban form is being determined. This study has hoped to take a step towards such an understanding. As a logical consequence, it should be followed by an attempt to apply this understanding in the process of urban design.

In such an attempt, the first consideration to be taken into account is the all important relation between knowledge and action. Nevertheless, the design is an activity which
should be identified with the agency responsible for the development. As shown in this study, these agencies may have different natures, purposes, and rationalities. An awareness of the standpoint of the action, as offered here, will be necessary for the designers.

Also it is important that the designers, as for other agencies involved in the development process, have an understanding of the relationships between the development agencies and how their different patterns of interaction might result in the creation of different forms. The same is true of the relationship between, and the constraints and possibilities of, the development factors and the physical and social contexts. The awareness of these relationships does not imply to constrain the activities of the designers, but to help them to know how to deal with complex realities.

The urban design process is a course of action, itself a part of a larger course of action of the development process. In the design process, therefore, there is a need for an action in which not only the rationality of self-expression is addressed, but also instrumental and social rationalities are taken into account. This study has hoped to elaborate the latter two rationalities while many designers identify themselves with only the former rationality of self-expression which is a fundamental essence of the artistic activities.

To sum up, what this study hopes to offer to urban designers is an awareness of the development process which would enable them to take into account the different dimensions of the process and to address all forms of rationality which would render their action a more comprehensive enterprise.
Appendices to Chapter Two

Appendix 2.1. Sources of Information

The sources of the tables in the text are individually mentioned. Most of the maps and figures for the present day Tehran are based on the data from Tehran census of 1980 (Aban 1359) and the national census of 1986 (Aban 1365). The former contains the most detailed data which has been ever published for the city.

The hierarchy of data in the 1980 Tehran census is formed of blocks, groups of blocks or superblocks called "Mahalleh" (quarter) and groups of quarters called "Mantagheh" (area). The city of Tehran, as conforming to its municipal administration, is constituted of 20 areas and 350 quarters.

The data available at the level of blocks are the number of places and their type of use as residential or workplace; and the population and the size of households. At the level of quarters, in addition to this data, the number and type of facilities and services as categorized as educational, religious, medical and health care, food stores, public facilities and government offices are published. At the level of areas, a rather wider range of data is available. Since the data at the level of quarters can depict a more detailed structure of the city and remain fairly consistent with the study at the quarter level, it was preferred to make more use of this level of data. Since the 1986 data has been available at the level of areas and only for a few variables, it has been necessary to compare them with their 1980 counterpart.

The figures of land price are based on the official prices updated by the Ministry of Treasury and Economic Affairs in 1987 to provide a legal basis for the deals and taxation. Although the official prices are far below the real land price, they can be convincingly taken as the indicators of the latter.

The base maps, which are used in this study to visualize the geographical distribution of the information, are from two main sources. Figure 2.1 is an adaptation of the 1:30,000 map of Tehran by Gita-Shenassy Institute. This map has also provided the base map for Figures 2.11 and 3.5. The base maps for Figures 2.2-2.10; 2.12; 2.13; 2.16; 2.19; 2.21; 2.23; 2.24; 2.28-2.31; and 2.2.1-2.2.20 are provided by the 1980 census of Tehran (MAI,1981).
Figures 2.17 and 2.27 are taken from an undated brochure from an exhibition in Tehran in the 1970s called "Neighbourhood" (Mahalleh). Figures 2.20 and 2.22 are the 1:2,000 maps of Tehran published by Iran’s National Cartographic Centre. Figure 3.1 is from Ahrens (1966); 3.2 from Tavassoli (1982); 3.3 from Alemi (1985); 3.4, 3.5, and 6.1 from Seger (1978), and 7.3.1 from Benevolo (1980). The rest of the figures are by the author.

Appendix 2.2. Data and Maps for Areas and Their Change in the 1980

In this Appendix, Tables 2.2.1-2.2.9 and Figures 2.2.1-2.2.20 provide further information on the variables discussed in Chapter Two.

Appendix 2.3. The List of Variables and the Results of Cluster Analysis, 1980, 1986

The available variables at the level of 350 quarters from the 1980 census, which are used in the cluster analysis of 1980, include 1. population; 2. size of household; 3. number of dwellings; 4. number of workplaces; 5. educational; 6. health; and 7. religious institutions; 8. food stores; 9. baths and coffee houses; 10. car related activities; 11. post offices, sport clubs and libraries; 12. banks; and 13. government offices.

The results of the cluster analysis of 1980 data for 350 quarters are:

Cluster 1. (22 Quarters):
Area 1: Quarters 3,7;
A3: Qs 2, 8;
A6: Qs 6, 7, 12, 13, 14, 15;
A7: Qs 1, 7, 18;
A11:Qs 3, 4;
A12:Qs 1, 2, 8, 9, 10.

Cluster 2. (111 Quarters):
A1: Qs 2, 4, 8;
A2: Qs 1, 4;
A3: Qs 3, 4, 5, 7;
A4: Qs 2, 4, 5, 6, 7, 8, 11;
A5: Q 7;
Table 2.2.1. Changes in the Density of Areas 1980-86

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<th>Change 1980-86</th>
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</table>

Harim | 14.9   |


Note: The area called Harim in the 1980 census, which is constituted of certain fringe areas outside the city, has not been mentioned in the 1986 census.
Table 2.2.2. Changes in the Size of Households 1980-86

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Source: MAI, 1987a; 1981
Table 2.2.3. Literacy and Employment in Areas 1986

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<th>Employment</th>
<th>% difference from average</th>
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Average | 82.26 | 0.00 | 23.95 | 0.00

Source: MAI, 1987a
Table 2.2.4. Changes in the Number of Workplaces 1980-86

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Note: Number of workplaces in 1980 = No. of workplaces + No of empty workplaces + No of workplaces combined with dwellings.
Table 2.2.5. Official Land Price in 20 Areas, 1987

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Source: VOED (Ministry of Treasury and Economic Affairs), 1987

Note: The data for the land prices are not originally published with reference to the 20 areas. The information in this table is an adaptation from the above mentioned source.
### Table 2.2.6. Number of Planning Permissions for New Development 1982-1985

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Source: ST (Municipality of Tehran), 1985
Table 2.2.7. Percentage Difference from Area Average in Planning Permissions for New Development 1982-1985

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Average: 533.2 695.4 645.5 578.2

Source: ST, 1985
Table 2.2.8. Number of Planning Permissions for Storey Addition 1982-1985

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Source: ST, 1985
Table 2.2.9. Percentage Difference from the Average of Planning Permissiions for Storey Addition 1982-1985

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<td>+78</td>
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<td>+104</td>
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</tbody>
</table>

---

total | 6666  | 11462 | 10444 | 8212 |
avrge | 333.3 | 573.1 | 522.2 | 410.6 |

Source: ST, 1985
Figure 2.2.1.
Density, 1980 (Areas)
Difference from the Average
(96.2 Persons per Hectare)

- less than -50
- 50 to 0
- 0 to +50
- +50 to +100
- more than +100
Figure 2.2.2.
Density, 1986 (Areas)
Difference from the Average
(114.9 Persons per Hectare)

- less than -%50
- -%50 to 0
- 0 to +%50
- +%50 to +%100
- more than +%100
Figure 2.2.3.
Change in Density, 1980-86

less than -%20
-%20 to 0
0 to +%20
+%20 to +%40
more than +%40
Figure 2.2.4. Household Size, 1980 (Areas) Difference from the Average (4.15 persons per household)

less than -%5  . . . . . .
-%5 to 0  . . . . . . . . .
0 to +%5  . . . . . . . . .
+%5 to +%10 . . . . . . .
more than +%10 . . . . .
Figure 2.2.5.
Household Size, 1986 (Areas)
Difference from the Average
(4.38 Persons)

less than -5% ........
-5% to 0 ............
0 to +5% ............
+5% to +10% .........
more than +10% .......

Legend:
Figure 2.2.6.
Change in Household Size 1980-86

decrease ......................................
0 to +5% increase ..............................
+5% to +10% increase .........................
more than +10% increase .................
Figure 2.2.7.
Literacy, 1986 (Areas)
Difference from the Average
(%82.26)

less than -%10 
-%10 to -%5 
-%5 to 0 
0 to +%5 
more than +%5
Figure 2.2.8.
Employment, 1986 (Areas)
Difference from the Average
(\%23.95)

less than -\%1
-\%1 to 0
0 to +%1
+%1 to +%2
more than +%2
Figure 2.2.9.
Workplaces, 1980 (Quarters)
Percentage in All Spatial Units of a Quarter

- 0 to %20
- %20 to %40
- %40 to %60
- %60 to %80
- %80 to %100
Figure 2.2.10. Workplaces, 1986 (Areas) Difference from the Average (14369 Units per Area)

- less than -50
- -50 to 0
- 0 to +50
- +50 to +100
- more than +100
Figure 2.2.11. Change in Number of Workplaces, 1980-86 (Areas)

- less than -5%
- -5% to 0
- 0 to +5%
- +5% to +10%
- more than +10%
Figure 2.2.12.
Health Care Facilities, 1980
(Quarters), Difference from the
Average (19.97 Units per Quarter)

less than -%50
-%50 to 0
0 to +%50
+%50 to +%100
more than +%100
Figure 2.2.13.
Educational Institutions, 1980 (Quarters), Difference from the Average (9.08 Units per Quarter)

less than -\%50
-\%50 to 0
0 to +\%50
+\%50 to +\%100
more than +\%100
Figure 2.2.14.
Government Offices, 1980
(Quarters), Difference from the
Average (2.05 Units per Quarter)

less than -%50
-5% to 0
0 to +5%
+%5 to +%100
more than +%100
Figure 2.2.15.
Banks, 1980 (Quarters)
Difference from the Average
(4.67 Units per Quarter)

less than \(-50\%
\-50\% \text{ to } 0
0 \text{ to } +50\%
+50\% \text{ to } +100\%
more than +100\%
Figure 2.2.16.
Car Services, 1980 (Quarters)
(Repairs, Petrol Stations, Parkings)
Difference from the Average
(27.48 Units per Quarter)

less than -\%50
-\%50 to 0
0 to +\%50
+\%50 to +\%100
more than +\%100
Figure 2.2.17.
Religious Institutions, 1980
(Quarters), Difference from the
Average (4.44 Units per Quarter)

less than −50
−50 to 0
0 to +50
+50 to +100
more than +100
Figure 2.2.18.
Public Baths and Coffee Houses, 1980 (Quarters), Difference from the Average (7.26 Units per Quarter)

less than -%50 ............... [Blank]
-%50 to 0 ..................... [Lightest shading]
0 to +%50 ..................... [Light shading]
+%50 to +%100 ............... [Medium shading]
mORE than +%100 ............ [Darkest shading]
Figure 2.2.19.
Food Retailers, 1980
(Quarters), Difference from the
Average (117.09 Units per Quarter)

less than -%50 ........................................
-%50 to 0 ...........................................
0 to +%50 ...........................................
+%50 to +%100 ....................................
more than +%100 ................................
Figure 2.2.20.
Land Prices, 1987 (Areas)
Difference from the Average
(Midrange Average
Rls16,790 per sq.m.)

less than -%50 .........
-%50 to 0 ............
0 to +%50 ............
+%50 to +%100 .........
more than +%100 .........
A6: Qs 3, 16;
A7: Qs 3, 4, 8, 9, 10, 11, 15, 16, 17;
A8: Qs 2, 3, 5, 6, 13, 16;
A9: Qs 3, 8, 11, 13;
A10: Qs 13, 14, 20, 21;
A11: Qs 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19;
A12: Qs 5, 12, 17, 19, 21, 25, 26, 28;
A13: Qs 3, 3, 10, 11, 13;
A14: Qs 6, 14, 17, 18, 20, 21, 22;
A15: Qs 1, 3, 4, 5, 6, 8, 9, 10, 12;
A16: Qs 4, 6, 7, 9, 18, 19;
A17: Qs 2, 6, 7, 9, 11, 12, 15, 16, 21;
A18: Qs 1, 6, 8, 9, 14;
A19: Qs 1, 6, 7;
A20: Qs 3, 6, 12, 13.

Cluster 3. (217 Quarters):
A1: Qs 1, 5, 6, 9, 10, 11;
A2: Qs 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14;
A3: Qs 1, 6, 9, 10, 11, 12, 13;
A4: Qs 1, 3, 9, 10, 12, 13;
A5: Qs 1, 2, 3, 4, 5, 6;
A6: Qs 1, 2, 4, 5, 8, 9, 10, 11;
A7: Qs 2, 5, 6, 12, 13, 14;
A8: Qs 1, 4, 7, 8, 9, 10, 11, 12, 14, 15, 17, 18, 19, 20;
A9: Qs 1, 2, 4, 5, 6, 7, 9, 10, 12, 14;
A10: Qs 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16, 17, 18, 19, 22, 23, 24, 25, 26;
A11: Qs 1, 2, 6, 18;
A12: Qs 3, 4, 6, 7, 13, 14, 15, 16, 20, 22, 23, 24, 27, 29, 30, 31;
A13: Qs 1, 2, 5, 6, 7, 8, 9, 12, 14, 15;
A14: Qs 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 19;
A15: Qs 2, 7, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21;
A16: Qs 1, 2, 3, 5, 8, 10, 11, 12, 13, 14, 15, 16, 17, 20, 21, 22;
A17: Qs 1, 3, 4, 5, 8, 10, 13, 14, 17, 18, 19, 20;
A18: Qs 2, 3, 4, 5, 7, 10, 11, 12, 13;
A19: Qs 2, 3, 4, 5;
A20: Qs 1, 2, 4, 5, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23.
From the 1986 census, the available data for 20 areas of the city are: 1. area; 2. population; 3. household size; 4. literacy; 5. employment; and 6. number of workplaces. Two other variables from other sources which are used for cluster analysis are 1. land prices; and 2. planning permissions.

The results of the cluster analysis of 1986 data for 20 areas are:

Cluster 1. (5 Areas):
Areas 3, 6, 7, 11, 12;

Cluster 2. (9 Areas)
Areas 8, 9, 10, 13, 14, 16, 17, 18, 20;

Cluster 3. (6 Areas):
Areas 1, 2, 4, 5, 15, 19.

Appendix 2.4. Data from the Sample Quarters, 1980

The sample quarters are:

1. Oudlajan, quarter 12 of area 11 of the 1980 census, defined by Nasser Khosrow, Amir Kabir, 15 Khordad, and Pamenar streets;

2. Baharestan, quarter 2 of area 11, defined by Enghelab, Sa’di, Baharestan and Sepah, and Jomhoori-Eslami streets and Mehran, Baharestan, and Esteghlal squares;

3. Daneshgah, quarter 15 of area 6, defined by Vali Asr, Enghelab, Kargar, and Boulvar Keshavarz streets as well as Vali-Asr and Enghelab squares;

4. Mortazavi, quarter 14 of area 10, defined by Mortazavi, Bistmetri Jangal, Hormozan, Jeyhoon, Simetri Jay, and Karimpour Shirazi streets;

5. Shahrara, quarter 9 of area 2, defined by Jalal Aleahmad, Lomumba, Sattar Khan, Yekta, and Niayesh streets;
6. Yousefabad, southern part of the quarter 3 of area 6, defined by Vali Asr, 18th, 48th, 43rd, Jahanara, and Modabber streets;

7. Shahrak-Qods, part 4 of quarter 3 of area 2, as defined in the 1980 census.

Tables 2.4.1-2.4.11 provide further information on the sample quarters.

Appendix to Chapter Three

City of Ray

The city of Ray, ancient Raga, has been continuously inhabited for more than six thousand years (Semsar, 1986; Kariman, 1976; 1971). According to the Avesta, the sacred book of Zoroastrians, Ray was the twelfth city in the world to be created by Ahura Mazda, the Good Spirit (Lockhart, 1960).

The city was located on the great Khurasan highway, along the southern side of the Alburz range, which has always been the main means of communication between east and west of Iran and a part of the Silk Route. It was one of the major cities of Media in Aryan times; the spring residence of the Parthian kings; and the place from which the last Sassanian king made his final attempt to rally the nation against the advancement of Islam (Lockhart, 1960).

In A.D. 643 it was occupied by the Arabs who, after a revolt by its inhabitants, almost totally ruined the ancient city and established a new one nearby. It became a favourite residence of certain early Abbasid Caliphs and a frequent residence of the founder of the Seljuq dynasty (Lockhart, 1960). The ancient city of Ray was revitalized by the House of Buwaih (Semsar, 1986). From the eighth to the twelfth centuries it enjoyed a prosperity and a growth of population, reported to be, not without exaggeration, as large as 8 million (Lockhart, 1960). In this flourishing period, Ray, as the second most important city in the East (Istakhri, in Sykes, 1902), was nicknamed by some as "the world's bride" (Semsar, 1986) or, for its antiquity, Shaykh al-Bilad or Umm al-Bilad (Dinwari, in Barthold, 1984).

Structurally, Ray, like other large Iranian towns of the time, consisted of a citadel (Quhandezh), an inner town (Sharistan), and an outer town (Rabad). The citadel was
### Table 2.4.1. Population

<table>
<thead>
<tr>
<th>Quarters</th>
<th>No of Population</th>
<th>No of Households</th>
<th>House-Size</th>
<th>House-Dwelling</th>
<th>Density (Person per ha)</th>
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<td>Oudlajan</td>
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<td>3394</td>
<td>3.36</td>
<td>2.92</td>
<td>242.74</td>
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<td>Baharestan</td>
<td>12107</td>
<td>5869</td>
<td>3.61</td>
<td>1.46</td>
<td>210.32</td>
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<td>Daneshgah</td>
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<td>4093</td>
<td>3.50</td>
<td>1.06</td>
<td>120.46</td>
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<td>1.61</td>
<td>583.17</td>
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<td>3161</td>
<td>3.83</td>
<td>1.04</td>
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<td>Yousefabad</td>
<td>16151</td>
<td>4370</td>
<td>3.70</td>
<td>0.98</td>
<td>167.96</td>
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<td>Shahrak-Qods</td>
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<td>1035</td>
<td>3.14</td>
<td>1.25</td>
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<td>City of Tehran</td>
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<td>1,319,784</td>
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<td>1.41</td>
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Source: MAI, 1981

### Table 2.4.2. Educational Institutions

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<th>Bah</th>
<th>Dan</th>
<th>Mor</th>
<th>Sha</th>
<th>You</th>
<th>S.Q</th>
<th>Quarter</th>
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<td>0</td>
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<tr>
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<td>0</td>
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<td>0</td>
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<td>0</td>
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<td>3</td>
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<td>63</td>
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<td>11</td>
<td>25</td>
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<td>9.08</td>
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Source: MAI, 1981
### Table 2.4.3. Religious Institutions

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<tr>
<th></th>
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<th>Dan Mor</th>
<th>Sha</th>
<th>You S. Q</th>
<th>Quarter</th>
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<tbody>
<tr>
<td>Mosque</td>
<td>17</td>
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<td>0</td>
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<tr>
<td>Takyeh</td>
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<td>1</td>
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<td>1</td>
<td>0</td>
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<tr>
<td>Other Relig.</td>
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<td>1</td>
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Source: MAI, 1981

### Table 2.4.4. Health Care Facilities

<table>
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<tr>
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<th>Dan Mor</th>
<th>Sha</th>
<th>You S. Q</th>
<th>Quarter</th>
</tr>
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<tbody>
<tr>
<td>Radiolg.Lab.</td>
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<td>0</td>
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<tr>
<td>Pharmacy</td>
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<td>11</td>
<td>8</td>
<td>2</td>
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<tr>
<td>Dentist</td>
<td>7</td>
<td>27</td>
<td>42</td>
<td>2</td>
<td>2</td>
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<td>158</td>
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<td>Hospital</td>
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<td>Other Health</td>
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<td><strong>total</strong></td>
<td>227</td>
<td>98</td>
<td>224</td>
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<td>21</td>
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</table>

Source: MAI, 1981

### Table 2.4.5. Food Retailers

<table>
<thead>
<tr>
<th></th>
<th>Oud Bah</th>
<th>Dan Mor</th>
<th>Sha</th>
<th>You S. Q</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supermarket</td>
<td>2</td>
<td>8</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Grocery</td>
<td>30</td>
<td>42</td>
<td>14</td>
<td>47</td>
<td>25</td>
</tr>
<tr>
<td>Butchery</td>
<td>11</td>
<td>21</td>
<td>11</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>Bird &amp; Fish</td>
<td>5</td>
<td>11</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Dairy</td>
<td>13</td>
<td>7</td>
<td>4</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Fruit &amp; Veg.</td>
<td>16</td>
<td>24</td>
<td>25</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>Bakery</td>
<td>16</td>
<td>19</td>
<td>7</td>
<td>19</td>
<td>12</td>
</tr>
<tr>
<td>Other Food</td>
<td>119</td>
<td>113</td>
<td>100</td>
<td>26</td>
<td>33</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td>212</td>
<td>245</td>
<td>173</td>
<td>139</td>
<td>81</td>
</tr>
</tbody>
</table>

Source: MAI, 1981
### Table 2.4.6. Public Services

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Oud</th>
<th>Bah</th>
<th>Dan</th>
<th>Mor</th>
<th>Sha</th>
<th>You</th>
<th>S.Q.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Bath</td>
<td>12</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Coffee House</td>
<td>24</td>
<td>16</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Car Repair</td>
<td>4</td>
<td>37</td>
<td>12</td>
<td>42</td>
<td>16</td>
<td>2</td>
<td>23.68</td>
</tr>
<tr>
<td>Publ.Parking</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Petrol Stn.</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Bank</td>
<td>9</td>
<td>28</td>
<td>31</td>
<td>2</td>
<td>6</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>Post Office</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Publ.Library</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Club</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Govmnt. Office</td>
<td>0</td>
<td>11</td>
<td>20</td>
<td>0</td>
<td>3</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

Total | 152  | 113 | 83   | 57   | 44   | 55   | 5    | 42.56|

Source: MAI, 1981

### Table 2.4.7. Facilities and Services in the Quarters

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>193.14</td>
</tr>
</tbody>
</table>

Source: MAI, 1981

### Table 2.4.8. Street System

<table>
<thead>
<tr>
<th>Quarters</th>
<th>Inner (m/ha)</th>
<th>Dead-ends (m/ha)</th>
<th>Dead-ends (%)</th>
<th>Open-ends (m/ha)</th>
<th>Open-ends (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oudlaajan</td>
<td>248.18</td>
<td>97.71</td>
<td>39</td>
<td>21</td>
<td>57</td>
</tr>
<tr>
<td>Baharestan</td>
<td>248.33</td>
<td>64.88</td>
<td>26</td>
<td>64</td>
<td>65</td>
</tr>
<tr>
<td>Daneshgah</td>
<td>153.00</td>
<td>32.57</td>
<td>21</td>
<td>35</td>
<td>59</td>
</tr>
<tr>
<td>Mortazavi</td>
<td>343.48</td>
<td>106.55</td>
<td>31</td>
<td>33</td>
<td>52</td>
</tr>
<tr>
<td>Shahrara</td>
<td>196.66</td>
<td>6.15</td>
<td>3</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Yousefabad</td>
<td>185.08</td>
<td>4.36</td>
<td>2</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Shahrak-Qods</td>
<td>125.25</td>
<td>54.42</td>
<td>56</td>
<td>59</td>
<td>89</td>
</tr>
</tbody>
</table>

Source: MAI, 1981
### Table 2.4.9. Blocks

<table>
<thead>
<tr>
<th>Quarters</th>
<th>No. of Blocks</th>
<th>Average Size (ha)</th>
<th>Household Size per Block</th>
<th>Total Area (ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oudlajan</td>
<td>37</td>
<td>1.27</td>
<td>91.73</td>
<td>47</td>
</tr>
<tr>
<td>Baharestan</td>
<td>99</td>
<td>1.02</td>
<td>59.28</td>
<td>100.83</td>
</tr>
<tr>
<td>Daneshgah</td>
<td>59</td>
<td>2.01</td>
<td>69.37</td>
<td>118.83</td>
</tr>
<tr>
<td>Mortazavi</td>
<td>63</td>
<td>0.60</td>
<td>79.37</td>
<td>37.66</td>
</tr>
<tr>
<td>Shahrara</td>
<td>87</td>
<td>0.86</td>
<td>36.33</td>
<td>75.05</td>
</tr>
<tr>
<td>Yousefabad</td>
<td>86</td>
<td>1.12</td>
<td>50.81</td>
<td>96.16</td>
</tr>
<tr>
<td>Shahrak-Qods</td>
<td>66</td>
<td>2.40</td>
<td>15.68</td>
<td>158.71</td>
</tr>
</tbody>
</table>

Source: MAI, 1981

### Table 2.4.10. Land Use

<table>
<thead>
<tr>
<th>Quarters</th>
<th>No of Dwellings</th>
<th>Dwellings per ha</th>
<th>Rsdnl</th>
<th>Workplaces per ha</th>
<th>Workpl Places Only</th>
<th>Wrkpl Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oudlajan</td>
<td>94.83</td>
<td>25.90</td>
<td>28</td>
<td>0</td>
<td>68.32</td>
<td>72</td>
</tr>
<tr>
<td>Baharestan</td>
<td>71.24</td>
<td>41.85</td>
<td>59</td>
<td>5</td>
<td>29.18</td>
<td>41</td>
</tr>
<tr>
<td>Daneshgah</td>
<td>49.19</td>
<td>34.13</td>
<td>69</td>
<td>0</td>
<td>15.57</td>
<td>32</td>
</tr>
<tr>
<td>Mortazavi</td>
<td>102.02</td>
<td>83.17</td>
<td>82</td>
<td>9</td>
<td>19.07</td>
<td>19</td>
</tr>
<tr>
<td>Shahrara</td>
<td>48.35</td>
<td>42.60</td>
<td>88</td>
<td>32</td>
<td>4.89</td>
<td>10</td>
</tr>
<tr>
<td>Yousefabad</td>
<td>51.90</td>
<td>46.23</td>
<td>89</td>
<td>12</td>
<td>5.79</td>
<td>11</td>
</tr>
<tr>
<td>Shahrak-Qods</td>
<td>6.74</td>
<td>5.24</td>
<td>78</td>
<td>55</td>
<td>0.17</td>
<td>3</td>
</tr>
</tbody>
</table>

Source: MAI, 1981

### Table 2.4.11. Age of Dwellings

<table>
<thead>
<tr>
<th>Areas</th>
<th>12</th>
<th>6</th>
<th>10</th>
<th>2</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1967-1968</td>
<td>37250</td>
<td>27914</td>
<td>39067</td>
<td>11831</td>
<td>390000</td>
<td>42</td>
</tr>
<tr>
<td>1967-1971</td>
<td>5241</td>
<td>13189</td>
<td>7649</td>
<td>12604</td>
<td>171237</td>
<td>18</td>
</tr>
<tr>
<td>1972-1976</td>
<td>3249</td>
<td>10985</td>
<td>3771</td>
<td>15890</td>
<td>169017</td>
<td>18</td>
</tr>
<tr>
<td>1977</td>
<td>1577</td>
<td>3605</td>
<td>1233</td>
<td>3825</td>
<td>61741</td>
<td>7</td>
</tr>
<tr>
<td>1978</td>
<td>1101</td>
<td>2787</td>
<td>926</td>
<td>2631</td>
<td>57232</td>
<td>6</td>
</tr>
<tr>
<td>1979</td>
<td>784</td>
<td>1739</td>
<td>668</td>
<td>2925</td>
<td>53220</td>
<td>6</td>
</tr>
<tr>
<td>1980</td>
<td>453</td>
<td>838</td>
<td>453</td>
<td>2208</td>
<td>36185</td>
<td>4</td>
</tr>
</tbody>
</table>

Total dwellings: 938642

Source: MAI, 1981
located on a steep hill with a view over the entire city (Ibn Rusta, in Barthold, 1984). The city was a square in shape, its sides reported to be from six to nine kilometres (Maqdisi; Istakhri, in Barthold, 1984). As in other commercial and manufacturing towns, the "rabad", wherein the bazaars were situated, became the focus of life, causing the inhabitants to abandon both the citadel and the inner town in the tenth century and shifting to the outer town (Barthold, 1984; Istakhri, 1961).

The factional strife between the Hanafis and Shafiis caused the initial deterioration of the city as early as in the tenth century (Barthold, 1984). The destruction of Ray was to be completed by the Moghul invasion of the year 1220 from which the city never fully recovered. After this, Ray remained as a major strategic focal point in the military movements across the Iranian plateau but lost its importance as a city. For a while, Varamin, a nearby village and now a city, was gaining regional superiority (Barthold, 1984) before it was time for Tehran to emerge.

Appendix to Chapter Four
Quarter System

With the expansion and reform of Tehran, the pattern of distinguishable urban quarters, which had structured the city until the nineteenth century, was dismantled. It was replaced by a new form of residential segregation along the lines of social classes. This Appendix, through a brief historical survey, tries to show how the subdivision of urban space has changed and how urban quarters have evolved.

The most distinguishable subdivision of urban space has been the separation of the citadel from the rest of the city. As shown in the Appendix 7.2, in the pre-Islamic periods, this was combined with the subdivision of cities into inner and outer towns. This constituted a subdivided urban space to accommodate a class-divided society. The size of the subdivision also was a witness to the hierarchical subdivision of society: citadel was smaller than the inner town and the inner town smaller than the outer town.

The gridiron pattern, and its associated subdivision of space into blocks, was introduced with the Macedonian conquest and, until its abandonment in the fourth century A.D. (Huff, 1986), remained in use for almost eight centuries. The original designer of gridiron pattern in Greece, Hippodamus, had envisaged the townspeople as three classes of artisans, farmers, and warriors (Vance, 1977). It is not, however, clear
that in the Hellenistic cities of Iran and those laid out on gridiron pattern afterwards, how any other form of subdivision, apart from the citadel-inner-outer town subdivision, has been at work. The only possible subdivision in this pattern could have been on the basis of blocks as the unit of urban fabric.

Nevertheless, apart from the concentric arrangement, other forms of subdivision have also been found. In the Parthian cities of Gorgan plain with their gridiron pattern of streets (Kiani, 1986), the urban space was subdivided into citadel and two other parts by walls. In the Sassanian town of Aivan-e Karkha (Huff, 1986), the three subdivisions of the town, which was a very long rectangle, were lined along a longitudinal axis.

The roots of the parochiality of social structure has been traced back to the Sassanian period (Varjavand, 1984; Lambton, 1980). The Sassanian society was stratified by estates and classes, and was composed of agnatic groups. According to a reform, introduced not later than the fifth century A.D., the society was divided into four estates: the priests, associated with judges; the warriors; the scribes, the members of bureaucracy; and the cultivators, craftsmen, and merchants. Membership of each estate being hereditary, movement from one estate to another was extremely difficult. Slave labour was extensively used but it was the work of free population that mainly sustained the economy. The most important structure within the civic community was the agnatic group, a community of kinsmen consisting several dozen extended patriarchal families with the same origin from the father’s side back to three or four generations before, which had a head and a council formed by the heads of families. This organization, which replaced the previous clan and tribal system, existed in the same form in Greece and Rome and its members, in addition to kinship, were united in economic, political, and religious aspects of life (Perikhianian, 1983:633-44). The lack of information about the relationship of this social organization with urban form leads to surmise that both physical and non-physical boundaries have been used to keep the estates apart.

After the Muslim conquest, a dramatic change in social organization seems to have taken place. The Arab garrison settlements were organized on tribal principles so that various tribes were settled in their own quarters which, under the tribal chief, were coherently preserved for some time (Stern, 1970:30). With the passing of time, through connection with the natives, an urban character appeared and the way of life in Arab camps became civil rather than military. With intermixture of elements from different tribes and the increasing importance of the natives who knew nothing about tribal
structure, the tribal pattern of the conquerors reduced to a sentimental link (Cahen, 1970).

The fusion of the Sassanian strict formal classes and the Arab tribal structure in the cities resulted in the new form of social organization represented by the new subdivision of urban space. Now the inner-outer town arrangement was abandoned. Residential areas of the Islamic city were divided into quarters, geographical entities as well as homogeneous communities which were closely knit, forming the basic unit of society. The solidarity between the small group of people living in each quarter was based on family, clientage, common village origin, ethnic or sectarian religious identity, in some cases probably strengthened by common occupation. There is no evidence to show the homogeneity of social classes as a base of solidarity since they were communities of both rich and poor. These village-like communities within the urban whole, with relatively few institutions connecting them to each other, were administrative units represented on a citywide political or ceremonial occasions, by a head who was selected by the governor. (Lapidus, 1969:49-51; 1967:85-95).

In many occasions, the quarters of a town showed endless hostility towards each other. The dispute between the quarter of a city, between neighbouring towns and villages, between different religious sects, or between tribal loyalties was causing an ever present strife in the cities. With the establishment of Shiism by the Safavid dynasty in the sixteenth century, the strife between Sunnis and Shiites reduced. Nonetheless, strife continued in the form of rivalry between two Sufi sects of Heydari and Nemati. The conflict between these factions, which continued in cases until the early twentieth century, caused much violence and bloodshed (Lambton, 1980; Kasravi, 1983).

The quarters were self contained in having their own mosque, bazaar, and public bath. They were located around the central core and were surrounded by semi-urban areas. Their location was in general determined by the availability of vacant land (Greenshields, 1980:123).

In some cities, quarters were separated from each other by undefined stretches of land or by ruins (Cahen, 1970:521), whereas in some others they were walled and protected by strong bars and gates (Arberry, 1960:54; Lambton, 1980:8). The walls provided security and also made the quarters "manageable component parts" of the city (Brown, 1973:32).
The number of quarters, being the basic unit of the city social and physical fabric, could often suggest the size and importance of a city, e.g. the large and prosperous Nishapur had 47 quarters (Frye, 1979 xxxii). The number of inhabitants of the quarters was relatively small, which allowed closer communication. In the late medieval period, Damascus had seventy quarters of five hundred population and Aleppo had fifty quarters of twelve hundred (Lapidus, 1967:85).

The quarters were different in status. Hia was known to be the best quarter in Nishapur with its fully roofed bazaar being the largest in the city (Frye, 1979 xxxii). The quarter to the northwest of central square in Bukhara (Frye, 1965) and the Avval quarter in Herat, which was the first receiver in the open water distribution system (English, 1973).

The quarter system in the Islamic cities, as in medieval Europe (Vance, 1977), might be seen as an outcome of feudalism, even though the form of feudalism in the Middle East and Europe has been different (Lambton, 1987). The parochiality (Lapidus, 1973; 1969; 1967) of the feudal society, therefore, has been reflected in the form of quarters so unrelated that the Islamic city has been regarded as "an assemblage of disparate elements" (De Planhol, 1970:454). It has also been seen as resulting from the alienation of the administration from the mass of the population through seizure of power by alien groups (Wagstaff, 1980:22-3).

It is, however, possible to cast doubt about a direct relationship between feudalism and quarter system, since feudal disintegration, along with a centralized imperial power, is known to have been at work in Iran both before and after the advent of Islam. Nevertheless, shortage of information about quarter system in the pre-Islamic period seems detrimental to make any general conclusion. It seems more plausible, however, to associate the erosion of quarter system with the disappearance of feudalism in Iran and with the incoming of capitalism and integrative nationalism.

Appendices to Chapter Seven

Appendix 7.1. Urban Administration Before the Nineteenth Century

Until the end of the nineteenth century, the executive head of the town was a prince or, more often, a military man appointed by him as the governor, having unrestricted duties and prerogatives except sitting in judgement in the religious court. Most of the
town business, however, was passed on to the governor's assistants, "Qadi" and "Muhtasib", whom he had the privilege to appoint (von Grunebaum, 1981: 151).

The office of the legal secretary of the governor developed to be the theoretically independent office of Qadi as one of the most vigorous institutions in the Islamic society. Nevertheless, he was not controlling the criminal justice, police, and taxation. (Schacht, 1970). Qadi was the trustee of the pious foundations who provided the maintenance of mosques, madrasas, and miscellaneous public services as fountains or hospitals, and could become the actual regent of the town (Von Grunebaum, 1981: 151).

An official was responsible for trades and local commerce, concerning with honesty in manufacture and selling, protection of the client from fraud, and of the manufacturer from competition. At first known as the "head of the suq", he was later given the more religious title of "muhtasib", the officer responsible for the duty to promote good and to repress evil by concerning himself with all questions of public morals, the behaviour of non-Muslims and women, the observance of ritual obligations, and the rules of professional ethics (Cahen, 1970, 529). Thus the position of muhtasib was the embodiment of a fusion of two concerns: that of ulama for moral order and that of the state for fiscal interests (Lapidus, 1967: 98). The muhtasib was delegated with some of the governor's judicial powers. He was the most important cog in the administration of any town, having the authority to punish the trespassers on the spot, but not to deal with statutory penalties of the shari'a. His duties included some form of development control such as dealing with complaints as to the encroachment on neighbour's boundary or extension of beams beyond the outside wall as well as supply of water and the repair of city walls (Mawardi, in Von Grunebaum, 1981: 153).

The muhtasib selected assistants from each craft or trade as their overseers, to be the agents of the state in levying taxes. They were advisers to muhtasib about the conditions of the trade and the market, being responsible to watch the craftsmen to execute their duties assigned by the government such as making provision for auxiliary military service and ceremonial occasions (Lapidus, 1967). The powers of the muhtasib in Iran remained unchanged until the seventeenth century when some of his functions were taken by the "Darugheh". The office of muhtasib disappeared in some cities in the nineteenth century (Lambton, 1980: 13-14).
A hierarchy of "kalantar" and "kadkhuda" were in charge of the cities from the sixteenth and seventeenth centuries onwards. Kalantar, who was appointed by the government, was in charge of the Kadkhudas of the wards and the affairs of the corporate organizations of the crafts and trades. The Kadkhuda, who was appointed by Kalantar, needed the support of the inhabitants of the ward and was a linking agent between the government and the townspeople.

The duties of the Kalantar being partly transferred to the "Darugheh", his office died out towards the end of the nineteenth century. The Darugheh and his subordinates, "Farrash" and "Gazmeh", constituted a kind of police system in the nineteenth century dealing especially with the settlement of disputes in the bazaar. (Lambton,1980:10-15).

Appendix 7.2. Duality of City and Citadel

A major characteristic of the nineteenth century Tehran, also to be found in some other Iranian cities of the time, was the duality of the citadel-city, both enclosed in walls and moats. This is a characteristic continuously present in urban structures of this area for the last five millennia. Indeed, the separation of the ruler and the ruled seems to be as old as the city itself and the class civilization with which it emerged.

Urban settlements started to flourish in the lands of present-day Iran in the third and the second millennia B.C., although rural settlements are found to have existed there from the eighth millennium B.C. (Sajjadi,1986). A level of "urban revolution" seems to have taken place after 3,000 B.C. in the Elamite civilization in the Khuzestan plain, neighbouring Sumerians in the Euphrates valley. Increase in food production led to a division of labour in society, handicraftsmen separated from agriculturalists, and concentration on priestly, military, judicial, and administrative tasks became possible. Class civilization emerged here in several city states, the most important of which being Susa (Diakonoff,1985a:4-5).

The form of Mesopotamian cities clearly reflected the new class structure. The palace and the temple, as the seat of government and the centre of religious and intellectual life, were joined together in the citadel. This was a walled precinct situated on a raised surface in the middle or on one side of the city. Around the citadel was an inner city walled and protected by rivers and moats. An outer city surrounded the inner city which had mostly walls and moats of its own. Inherent in this hierarchical arrangement was a residential segregation according to class stratification, in which the highest
ranks lived in the innermost areas. The markets situated either within or without the walls, while workshops were often related to the temple (Benevolo, 1980; Gaube, 1979; Morris, 1979).

When Aryan nomads moved from the north into the Iranian plateau in the second millennium B.C., they entered an interaction with established Mesopotamian civilization. This was intensified by the occupation of Babylon in 539 B.C. by Cyrus and the political unification of Iran and Mesopotamia which lasted for the next fifteen centuries.

From about 700 B.C., autonomous city states, which had a powerful council of elders and a popular assembly, and which were governed by the "lord of the township", united to form the Median Kingdom. Their cities, as depicted by the Assyrian reliefs were formed of a citadel in the middle of several concentric fortifications, up to seven in the capital Ecbatana (now Hamadan) (Diakonoff, 1985b; Ghirshman, 1964).

The foundation of a worldwide empire by the Achaemenians (559-331 B.C.) led to an increase in the power of the king and hence the widened social divide (Cook, 1983). The distance and the striking disparity between the royal town and the people's town are best exemplified by Susa (Amiet, 1986; Perrot, 1986; Berghe, 1966), and Persepolis (Colledge, 1977; Porada, 1985).

The Greek cities, as in Knossos in Crete and later in Athens, were typified by the distinction between the religious and government precinct, acropolis, and the surrounding residential areas enclosed within city walls. Acropolis, however, was seen by Aristotle as suitable for oligarchy and monarchy as opposed to level ground for democracy (Vance, 1977).

The Macedonian conquest (330-250 B.C.), which was followed by a Hellenized period in Iran (Schlumberger, 1983), witnessed the plantation of a number of polis type cities by Alexander and the Selucid monarchs (Lukonin, 1983). The Selucid cities, such as Dura-Europos (Perkins, 1973), Merv (Colledge, 1977), Ai Khanum (Schlumberger, 1983), and Taxila (Colledge, 1977), were all built with a raised citadel within a walled city.

The Parthian dynasty (250 B.C.-A.D. 224), which succeeded the Greek Selucids, had a more or less feudal structure through dependence on the loyalty of hereditary great
families (Brown, 1978). Apart from the raised citadel, some Parthian towns were divided into two walled parts accommodating the nobility and the townspeople separately (Kiani, 1986).

In the context of a feudal economic structure (English, 1966), the Sassanian dynasty (224-641 A.D.) built a more centralized political system with many new royal cities as its administrative headquarters (Lukonin, 1983). The first Sassanian kings established and improved the old cities: eight cities by the first and fifteen by the second king. They settled migrants to secure the development of agriculture and industry throughout the empire. The apex of city plantation and urbanization was the second half of the third century and the fourth century. A second but less important wave of foundation of new settlements occurred in the sixth century. On the verge of the Islamic conquest, Iranian towns had often a citadel (Quhandezh) on a high level, a walled town (Sharestan), and sometimes an outer town (Birun, Rabaz). The society was formally divided into four estates (Perikhanian, 1983), but only some of the cities were internally subdivided by walls (Huff, 1986). The markets were located in the suburbs (Von Grunebaum, 1981), whose walls were sometimes erected to protect the food supply (Huff, 1986), to enclose the town expansion (Taqavi-Nezhad, 1985), or to protect a whole area with its rural settlements (Frye, 1965).

Between the Arab conquest in the seventh century and the appearance of the general physical pattern of the Islamic city in the eleventh century (Lapidus, 1973), lay a period of transformation and modification of the society and the cities.

Seeking control over the conquered as well as over the migrant Arabs, the conquerors settled down in garrison camps located either in the suburbs of the existing towns or near to them (Von Grunebaum, 1981; Cahen, 1970; Lapidus, 1973). Thus the ancient towns were confronted by Arab-founded or Arab-settled places, which gave rise to a double city tradition (Lapidus, 1973). In some places, like Merv and Bukhara in eastern Iranian land, large numbers of Arabs settled in the cities to keep control of the Silk Route (Frye, 1979ix), while many of them chose to settle down in villages throughout Iran (Wagstaff, 1980).

The plantation of garrison camps outside the towns gradually resulted in the creation of large urban areas, attracting the rural population freed from the former strict class divide. Naturally, the ancient cities had not the capacity of accommodating the rapid population growth. The suburbs, therefore, became where the bazaars were made and
where the tradesmen and craftsmen resided alongside the conquerors. The camp towns became the foci of cultural fusion and in many spheres of life new distinctions of class, status, and power came into being along with new commercial, political, and religious ties (Ashtor, 1976; Lapidus, 1973). This implied, in some cases deliberate, drain of the ancient towns from their livelihood with shifting the town centre (Gaube, 1979) or abandonment of the citadel and the walled city (Barthold, 1984; Streck, 1978).

Inheriting the centralized administrative system of Sassanians, the Abbasid empire created a unified political and economic unity with money economy at a pre-capitalist stage (Ashtor, 1976). By the time this empire was disintegrated following the revolutionary upheavals of the tenth and eleventh centuries, the cities of Islamic land had acquired their similar urban form. In the period before the rise of the Safavid and Ottoman empires, Arab cities and cities with pre-Islamic origins need no longer be distinguished (Lapidus, 1973).

In Iran, the period between two flowering stages of the tenth and the fourteenth centuries (Frye, 1979xxi; 1979xxii; Hodgson, 1974; Grabar, 1968), witnessed the political instability and disastrous invasions of Moghuls and Turks (Lambton, 1978). While the eastern cities like Bukhara expended in the first flowering stage in the tenth century (Frye, 1965), the fourteenth century is a period in which the cities and even villages in west, southwest, and centre of Iran reached their quasi-permanent architectural setting (Grabar, 1986).

The pattern of the cities which emerged during the Islamic period no longer shows a hierarchy of inner and outer towns. Nevertheless, the duality of citadel-city was retained (Wagstaff, 1980; Gaube, 1979; Tavassoli, 1982). The hilltop citadels remained in use but in new places the ruler's quarter was built at ground level separated by walls. This was mostly located on one side of the town to be protected from both internal and external dangers.

In Esfahan, the capital of Safavids (1502-1722), who re-emerged the old centralized administrative system, a new royal quarter was built. Being added to the old city, it has been called "Persian garden suburb" (Wagstaff, 1980:29) and seems to have reduced substantially the city-citadel duality. Nevertheless, other cities, including Tehran, Kerman (English, 1966), Kermanshah (Clarke & Clark, 1969), Bam (Gaube, 1979), and Yazd (Tavassoli, 1982), as well as Herat (English, 1973) continued to have this structural duality until the end of the nineteenth century and well into the twentieth.
Appendix 7.3. Axiality and Centrality in Urban Space

Urban space in the nineteenth century Tehran centred on a square which linked the citadel with the main artery, the bazaar, leading to the main city gate. As it is tried to show in this brief historical survey, this axial pattern has been in use for long periods in Iran with similarities in other parts of the world.

An excavated residential area of the Mesopotamian city of Ur shows a rudimentary form of bazaar, along a main intra-urban communication axis were located religious buildings, schools, hostels for foreign merchants, shops, and nearby craftsmen (Gaube, 1979) (Figure 7.3.1).

The settlement pattern, however, which had a considerable influence on the development of Iranian towns and villages, started to develop in the middle of the first millennium B.C. in Khurasan. These settlements, now called "qaleh", to whose rectangular form a reference was made earlier, had an internal axial layout. It was formed by a main street, stretched from the single gateway and flanked by houses, and a central square as the communal park of the cattle. Individual courtyard houses were all attached to each other and scattered against the inner face of the habitable defensive wall which was a quadrangle with corner towers (De Planhol, 1968:425-28).

The city of Athens in the fifth century B.C., like other unplanned Greek cities, had a main path, leading from the main gate to the acropolis, along which an agora evolved from a market and a meeting place (Morris, 1979:25-6). In the Hippodamian principles, however, gridiron was centred on an agora and the pattern of a main street was not used. Therefore, the axial layout of Selinus in Sicily by the Greeks has been regarded as unusual (Morris, 1979).

Nevertheless, the Hellenistic cities in the East had axial layouts. In Dura-Europos, the main street of the grid was stretched from the main gate through a ravine, on whose both hills stood the citadel and the palace of the city's chief magistrate, and leading to the river gate. The agora, an open square surrounded by shops, situated at the intersection of the main street with the other axis of the grid on which temples located (Perkins, 1973; Colledge, 1977). The cities of Merv (Colledge, 1977) and Herat (Gaube, 1979; English, 1973) were square settlements with two main axes intersecting at right angles leading to four gates. This was a pattern which the latter city has kept
Figure 7.3.1.
Urban Fabric in the City of Ur
until the twentieth century, and which has been known as a major characteristic of Iranian cities.

The principle of a square city oriented to the cardinal points of the compass with four gates in the middle of its four sides and two main axes is found to have traces in Indian thought (Gaube, 1979). The combination of bi-axiality and gridiron pattern in a square shaped settlement might also be found in Roman cities. The Romans applied the Hippodamian principles in a simplified and standard way and added to it a bi-axiality inherited from Etruscan past (Benevolo, 1980; Vance, 1977). The two main axes, decumanus maximus and cardo maximus, were laid down towards the cardinal points of the compass.

In the Parthian cities, the trades and crafts were placed along the streets which led to the gates (Kiani, 1986). The Sassanian cities were mostly quadrangles oriented to the cardinal points of the compass with four gates in the middle of each side, from which two intersecting axes stemmed to form the internal layout of the city. This bi-axial layout was also present in circular cities like Firuzabad (Huff, 1986).

It appears that with the abandonment of the gridiron pattern in internal layout of the cities, the principle of bi-axiality was also abandoned in favour of the old mono-axial layout. The city of Aivan-e Karkha, which was built in the fourth century is an evidence to the return to mono-axial layout. It was a rectangle four by one kilometre, divided into three parts by walls but linked with an eccentric longitudinal street (Huff, 1986).

The bi-axial pattern in quadrangular settlements was kept in most cities at least until the tenth century (Barthold, 1984:126,139). Based on the existing urban forms, the pattern of Islamic city which emerged had both mono-axial and bi-axial patterns (Wagstaff, 1980:22; Gaube, 1979:20; Tavassoli, 1982:44).

According to a historian in the Islamic period, the Sassanians believed that the world has four orientations and the city gates should be opened to them (Ibn Isfandiar, in Ashraf, 1974), an emphasis also found in architecture. It has been said that, the addition of new gates to the four existing ones in Islamic period was a symbolic confrontation to the values of the ancient non-Muslims who had built them.
The main street or streets of the Islamic city were roofed and flanked by the shops and workshops to constitute the bazaar. It was the backbone of the physical fabric on which the street pattern centred. In larger cities, bazaar was a network of shopping streets stretched from the city centre or form the citadel towards the gates along the main intra-urban axes with, moving towards the periphery, a pattern of gradual decrease in prosperity and importance of each branch of trade. Even in this network, a shopping street which was more important was considered as the main bazaar.

The Safavids introduced a new form of street, a wide boulevard with trees, streams, and pools called Chahar Bagh (Four Gardens) (Honarfar, 1984a). The patterns that they set were repeated in Kerman (Hillenbrand, 1986a), Shiraz (Arberry, 1960), and followed by the developments of the Zand dynasty in the second half of the eighteenth century (Clarke, 1963). In Mashhad, the old fabric was cut by the Safavids to provide access to the shrine of Imam Reza through two broad avenues which had a water canal running down in their middle (Paganini Alberti, 1971).

Squares

It is known that the rectangular settlements of the northeastern Iran had, apart from a main street, a central square. But, due to the absence of information, there is no clear trace of squares in subsequent periods, apart from the agora in Hellenistic cities. Firdausi mentions that a legendary king, Lohrasp, had built in the city of Balkh places in the streets, bazaars, and quarters "to hold the Feast of Sada, round a Fane of Fire" (quoted in Boyce, 1983:793). Gaube (1979) refers to an open marketplace inside the walls in front of the northern gate of the Sassanian city of Jayy (Esfahan) in which the farmers could take refuge from danger. There are also reports about the urban squares in which polo was played.

In Islamic period, there existed a public square in some cities. In medieval Esfahan, a square was in the middle of the city surrounded by mosques, madrasas, palaces, bazaar and Qaysariyyeh, and a royal music pavilion (Gaube, 1979: 76-7). This square was used as a horse race course as were the squares in the outskirts of many Iranian cities, which were also used for commercial purposes. In some cities, like Bukhara, a square linked the citadel and the city, in which contact with the ruler was possible. It became the administrative centre of the city with official buildings and palaces of amirs around it. This square was also used for festivals (Frye, 1965:42,92,94).
The pattern of a main square in the middle of the city remained a typical component part of many Iranian cities. It reached its most sophisticated form in the Safavid Esfahan in which the main square (Meydan-e Shah, King's Square) was flanked by monumental buildings of royal palace and two mosques as well as by the entrance of the main bazaar. The square was a marketplace as well as a place to play polo (Honarfar, 1984b).

Another form of urban square should be seen in the courtyards of religious buildings. "Takiyeh", a place for religious ceremonies, and mosque both provided enclosed squares in the middle of urban fabric with access to different routes. Although the main mosque was situated along the main bazaar, it has been sometimes separated from the secular square which linked the citadel with the city. Small spaces which almost incidentally were left open at the intersection of the streets should also be noted as another form of square.

The evolution of streets and squares in Iranian cities reveals the continuous presence of axially in urban structure. The streets were, in gridiron pattern or in distributional pattern, forming a network of which the main street was elaborated, functionally and architecturally, as the backbone of the urban social and physical fabric. The square in this arrangement was a part of the main axis which linked it with the ruler's quarters in citadel.

Appendix 7.4. Islam and Urbanism

It has been argued that Islam has an essentially urban character. Coexistence of sedentary life in the oases and pastoral nomads was the characteristic of the birthplace of Islam. A few years after the introduction of the new faith in the town of Mecca, the relationship between the two groups established in favour of the townsman, creating a coalition which unified the peninsula and conquered large areas outside it. This combination of the groups has been chosen by some to explain the twofold nature of the Islamic expansion in which the most complete expression of the religion, at the first instance being spread by nomads, appears in an urban setting (De Planhol, 1970:443-7).

Migration to the cities from the desert or from villages was known as a "hijra", an entry to Islam which asked the believers to gather in communal prayer. The Friday prayer, the most significant religious meeting of the whole community (umma) demands fixed and permanent place. The Friday mosque, fixed, roofed, and fully walled as defined by
theologians, is to be built in cities. According to some law schools, the Friday prayer is valid when forty persons participate. The mosque, being the characteristic symbol of the presence of a Muslim community, makes the settlement defined as a city, the only place in which could be lived out to the full the correct life as prescribed by the book of God and the Prophet’s Tradition (Von Grunebaum, 1981: 143). The rhythm of Muslim practices and the installations this demands is regarded as designed for town dwellers: The pool of the mosque for ablution, the five daily prayers, the call of the muezzin, the active nights of the Ramadan fast are seen to be urban in character (De Planhol, 1970: 446). Furthermore, town life is necessary to the dignified life which Islam demands. The sacred character of cities like Mecca, Medina, and Jerusalem, and the holy cities by virtue of the presence of shrines and graves of scholars and saints, is suggested to show the importance of city in Islam.

On the other hand, it has been argued that the association of Islam with cities has been more based on historical circumstance, in which Arab-Muslims mostly settled in a few cities during the conquest, rather than on religious principles. This is because what is essential in Islam are communities of persons and not cities or physical settlements. For an Islamic community what is required is a small number of Muslims who adhere to the faith, rather than persons who belong to any particular territory or space. In this sense, a Muslim community may be a bedouin group, a village, a sect, a law school, or a Sufi brotherhood (Lapidus, 1973:59).

Appendix 7.5. Geometrical Regularity

The street pattern of the nineteenth century Tehran was very much similar to that of Ur in the third millennium B.C., both with twisting streets leading to dead-end alleys and courtyard houses. In both cities, geometric forms were absent in the form of city walls and urban space but present in the ceremonial and administrative buildings as well as in the houses.

The city of Babylon, founded in about 2,000 B.C., had an inner town laid out on a geometrical pattern. It was a rectangle bisected by the Euphrates river and streets crossing at right angles. The same was in Khorsabad which, founded after 720 B.C., was a square shaped settlement with intersecting rectilinear streets (Benevolo,1980).

In Achaemenian capitals of Susa and Perspolis, grandiose rectangular patterns of royal palaces contrasted significantly to the irregular layout of towns surrounding them.
APPENDICES

(Perrrot, 1986; Porada, 1985). Townships and villages with rectangular external shape, with high walls, corner towers, and a single gateway controlled by a watchtower, started to develop in the middle of the first millennium B.C. to become a common feature in Central Asia by the time of Alexander (De Planhol, 1968:425-6). This form of a settlement enclosed in rectangular walls, which has survived to this date in some parts of the country, was the basis of a more or less standard form for Iranian cities until the beginning of the Middle Ages.

The Macedonian conquest introduced the strict geometrical forms designed originally by Hippodamus of Miletus in the fifth century B.C. for the rebuilding of the towns devastated by the wars (Vance, 1977; Benevolo, 1980). The Hippodamian plans of Miletus and Pirène show gridiron network of streets within irregular city walls. Whereas this pattern was used by the Greeks in the building of Dura- Europos on Euphrates river (Perkîns, 1973; Colledge, 1977), they seem to have built Merv and Herat on another pattern. In the building of these cities, the Greek Hippodamian style of gridiron network of streets was combined with the Central Asian tradition of rectangular city walls. This pattern, which was also widely used in the Roman cities, was to become one of the main characteristics of the towns laid out in Iran especially during the Sassanian period.

In the castles and towns in Parthians' birthplace in Gorgan plain, southeast of the Caspian sea, which were built or repaired from the third century B.C., a move towards stricter geometric forms might be seen, from polygonal to circular and rectangular city walls (Kiani, 1986). The circular form which developed under Parthian has been said to be derived from defensive value of reduction in the length of city walls compared to rectangular forms (Colledge, 1977:34). The first Sassanian king (224-240 A.D.) built his capital a circular city based on detailed calculations with much higher accuracy than its Parthian prototypes (Huff, 1986). The cities built by the Sassanian emperors, however, were mostly quadrangles with internal gridiron pattern.

The use of gridiron pattern seems to have come to an end by the fourth century (Huff, 1986). Nevertheless, the external shape of the cities continued to be rectangular. In the second period of Sassanian city building in the sixth century, the main stress was on the building of palaces, castles, and temples. Less attention was now paid to the urban residential areas, which appears not to be unrelated to the introduction of formal stratification of society the mid-Sassanian period (Perikhanian, 1983). Like in Roman towns after the apex of that empire in the second century (Von Grunebaum, 1981), the
transformation of gridiron pattern seems to have started in Iran in the late Sassanian period.

After the Muslim conquest in the seventh century, in spite of the highly sophisticated use of geometry in architectural space and detail, no trace might be found of geometric regularity in street patterns or city walls. An exception like the round city of Baghdad is, like the late Sassanian cities, signifying concern for the external shape rather than internal patterns of streets.

In Iran, in the Islamic period as in the pre-Islamic times, the geometric forms were applied in the gardens, houses, palaces, and religious and public buildings. The only exception which extended geometric forms to urban space was in the developments in Esfahan and other major cities in the sixteenth and seventeenth centuries. In Tehran of the nineteenth century, as most cities of the Islamic period, geometric forms were present in buildings and absent in the layout of the streets and city walls.
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