THE INTERACTION OF PLANNING POLICIES AND CONSTRUCTION TECHNOLOGIES:

In Iran with reference to China & Japan

A thesis submitted to the
Department of Town & Country Planning
in accordance with the requirements of the
Degree of Doctor of Philosophy.

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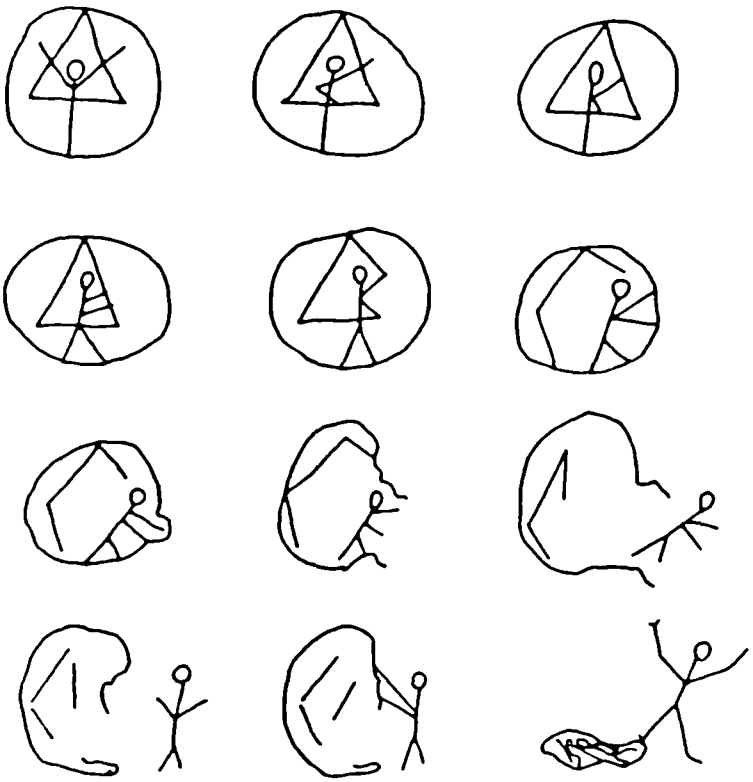

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SYNOPSIS

This thesis investigates the relationship between planning and the construction industry. It puts forward the concept of Planning Construction Interactions (Pl.C.I) and sets out to validate this concept by the examination of three hypotheses.

The production of the built environment is a complex process involving the activities of different agents. The physical evidence of the development process is found in the form of hospitals, houses, roads and physical and social infrastructure. The construction industry is one of the main actors in the development process which plays an important role in the economic development by its contribution to Value Added, Capital Formation, Gross Domestic Product and Employment Generation.

The failure of development plans in many developing countries is due to many factors. There is evidence from these countries of plans having been devised on the basis of inappropriate policy agendas and technology. The source of inappropriacy is often foreign technology and expertise.

In order to identify the constraints to development, the planning construction processes are examined in three countries: Iran, China and Japan. The main part of the thesis is devoted to Iran. In this context a detailed analysis of economic development and physical planning since the end of the Second World War is presented. As a result of this investigation a number of factors are identified which have a direct impact on the construction industry.

It is also argued that development policies have a direct impact on the choice of construction technology and materials.

Appropriate technology is commonly thought to offer a panacea. The result of a case study of the process of technology transfer is presented. The Iranian case identifies the reasons

for failure of appropriate technology whilst the examination of the Chinese development demonstrates the importance of appropriate technology in national development since the 1949 revolution.

A part of the thesis is devoted to the study of the planning and construction processes in Japan. This is focused on the role of the construction industry in the economic development of that country and how it is affected by government actions. Japan offers an interesting mechanism of planning and implementation processes. This developed from the introduction of a series of land use planning policies allowing for the involvement of the private construction sector in the financing and provision of infrastructure in urban areas.

A series of recommendations are made in the context of post war Iran. A possible framework for the development of the construction industry is put forward which emphasises the use of appropriate technology and building materials. This is seen as part of the integrated development planning approach.

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As with any other research work all the responsibility for errors and misinterpretation is with the Author.

CHAPTER I

1.1 Research Background and Objectives

The development problems faced by Iran and other developing countries continue to defy solution. Inspite of the endemic nature of the problems, several prescriptions have been offered, tried and abandoned (Bell-Gam 1984). A review of the current literature reveals the extent of failure and or achievements of such solutions. The failure of Iran and other developing countries in solving acute housing shortages, dilapidated physical infra-structure and massive urbanisation illustrate the scale of problems and the desperate need for alternative approaches to development planning and implementation strategies.

The origins of this research are rooted in an earlier study. Between 1983 and 1985 as part of a Master's degree programme, a study of post-disaster housing programme in Iran was undertaken by the author (Ghanbari Parsa, 1985). This study concerned an appraisal of the effectiveness of the government backed reconstruction programmes of areas devastated by numerous earthquakes in the 1970s and early 1980s. It was during the field visits and many encounters with officials in charge of reconstruction that it was realised that technical solution and safer housing was not the tangible prescription for long term survival of Iranian communities.

At a time when Iran was engulfed by a devastating war and subjected to massive urbanisation as a result of large scale population movement out of the war zone and the 1979 revolution, massive amount of investment was being made in the reconstruction of the earthquake stricken areas. In evaluating the outcome of the reconstruction programmes a number of key issues had to be considered. A programme can be perceived as successful when there has been an appropriate mechanism of planning, resource utilisation and allocation and an effective implementation procedure. The examination of the reconstruction programmes in Iran highlighted the impact of political decision making and the implications for development planning and implementation.

The demise of the Crash Housing Programme, in Iran, the folly of the new Nigerian Capital at Abudja, and the failure of the Socialist Villages Programmes, in Algeria are the most vivid examples of how development programmes can come to a disastrous end. These programmes were originally devised as well intentioned remedies to such problems as acute housing shortages (Mc Cutcheon, 1979), for national reconciliation (AJ 1985, Jibir 1985, Olamola 1987), and the improvement of rural areas (Sutton 1982, Hadjou 1982, Mahdjoubi 1985).

Each of these programmes initiated massive construction operations as a result of national economic development planning and physical development planning strategies. As a consequence the fabric and physical appearance of the built environment in these countries changed dramatically. The change in patterns of traditional urban form has been as a result of adoption of western city planning principles whilst the change in physical appearance of buildings has been caused by the use of modern materials and methods of construction. Therefore the indigenous methods of housing and infra-structure production in these countries has been greatly influenced by imported modern systems of production.

The modern building forms and building delivery systems which depict the glossy image of the technological developments of the current international norms so valued by the elite are seen as the only course for achieving rapid development (Chabbi 1988). However this approach to development contrasts with the realities of the indigenous cultures and norms in the Third World. Such contradictions have ramifications in both cultural and economic denudation of resources in much of the Third World. The evidence from different studies on the effect of adopted development strategies suggest that development plans often fail to reflect and analyse the real needs of the society. As a consequence such policies are too autocratic and ambitious (Bor 1982).

The rapid technological change and the widening gap between the developing countries and the developed world is a dilemma facing development specialists. Aspirations for modern development dictate development strategy based on the importation or transfer of western technology which is both expensive and has not been that successful. The economic and technological dependency of these countries are evidence of such failure.

The Iranian construction industry demonstrates the true costs of dependency (Mc Cutcheon, 1979, Farvar, 1987), it being shaped by imported technology. The construction industry in developing countries has attracted much attention and has been subjected to much research by individuals (Wells, 1986, 1988,) national and international agencies including the World Bank, the International Labour Organisation and the United Nations Centre for Human Settlements (UN Habitat, 1984).

The majority of the research is too narrow and is concentrated on the economic aspects of the construction industry, the size and type of firms, the formal or informal construction sectors and the purely engineering or technological aspects of the construction industry. This research argues that whilst it is vital to consider the above factors, at the same time the relationship and inter-connection of the planning and construction processes and the role of technology in this inter-relation should be closely examined. The intention in this research is to look at both the planning and construction processes in contemporary Iran. The objective is to examine the interactions and impact that the two components of planning: economic development planning and physical development planning have upon the construction industry and vice versa.

The term Planning Construction Interaction is coined for this study as a shortened term Pl.C.I to refer to these interactions. The research proposes that **Planning Construction Interaction (Pl.C.I)** is a two way flow that makes both planning and construction processes so inter-dependent. To conceptualise such an inter-dependent connection between planning and construction a number of key questions were generated. The questions meriting careful consideration are:

1. What is the strategic role of the construction industry in overall national development?

2. What are the political and institutional factors that affect the planning and construction processes?.

3. Is the construction industry predominantly private or public?

4. Is the contribution of the private sector of any significance?

5. What consequences do national economic development strategies have on the choice of technology?

6. What factors determine the choice of construction technology?

7. What are the implications of international, intra-national on the urban-rural context of technology transfer?

The change in patterns of technology constitutes further research to determine how such trends are set and what factors contribute to the selection of particular kind of technology . In this connection Barras (1987) states;

> 'Conventionally, when we try predicting where trends are taking us, our first instinct is to look to the past, and then project patterns forward to the future. Sometimes, we try and discern longer-term patterns, or waves of behaviour, of technological advancement, and of economic activity'. (Barras, R. 1987, p5)

1.2 Definition of Terms

In order to address the above questions it is vital to define the construction industry. Various definitions have been put forward by a number of leading construction experts. For example Wells (1986) provides the following definition:

> 'The construction industry will therefore be defined to include not just the activities generally carried out by main contractors but rather the whole construction process, including the production of building materials and the process of planning and design, in both the public and private, formal and informal sectors' p13

The UNCHS Habitat's definition of the construction industry is:

> 'The construction industry is composed of contractor organisations and individuals which use their skills, labour, finance, tools and equipment to procure, combine and assemble a variety of materials and components to

> produce: buildings (houses, offices etc), plant and process facilities (factories etc) for various industries and infrastructure systems from transportation, communications and water and power supply' (UN Habitat 1984, p20)

Although the definition does not include the manufacturing and supplying sectors, they are referred to as 'critical contributors' to the construction sector (UN Habitat, 1984, p21).

In this research the construction industry is seen as the activity/process which embodies all construction related facets including the manufacture and distribution of construction materials, machinery and equipment, also the process of planning and design of projects including economic infrastructure (local roads, transport distribution, etc) social infrastructure (health centres, rural housing etc) and implementation of plans.

The structure of the construction industry in developing countries although dominated by the public or government sector has considerable if not total dependent on the activity of the private and informal sectors. This is particularly so in the case of the housing market and the production of building materials which is dominated by small firms activity. Market conditions therefore play a significant role in determining the trend of technology and building materials used for private house construction. The relationship between market mechanism and the choice of construction technology and building materials is of considerable relevance but greatly overlooked. It is investigated further in the course of this study.

To define planning is a difficult task for a non-planner, as planning has different paradigms. There are two main streams of planning profession - that of economic development planning and physical or land use development planning (Conyers & Hills, 1984). Planning in developing countries is based on two differing principles: on the one hand, there are those who follow the developed capitalist countries' model of planning and development, on the other hand, there are the 'socialist developing countries', who base their model of development on the socialist and centrally planned principles (Forbes & Thrift, 1987).

In Streeten's view:

> 'sensible planning builds on some present social interests and values, and works to alter some. It may also work on itself, to change the conditions for planning. Its function is often 'to turn means into ends and ends into means where the development process requires this' and to improve itself by so doing'. (cited in Stretton 1986, p16)

Others see planning as a 'set of procedures' and base their theory on this principle (Davidoff & Reiner 1962). They define planning as:

> 'a process for determining appropriate future action through a sequence of choices'. (Davidoff et al 1962, p11)

Faludi defines planning as 'the application of scientific method- however crude- to policy making (Faludi 1973, p1). He further adds:

> 'Planning is what planning agencies do, i.e. bring scientific advice to bear on decisions concerning policies during an interactive process involving the roles of advisors and decision makers' (Faludi 1973, p2)

Friedmann's (1987, p26) classification of contemporary planning includes: Economic Planning; Social Planning; Environmental Planning at the national, state and local levels; City Planning and regional Development Planning. In his view:

> 'Modern planning practice is a social and political process in which many actors, representing many different interests, participate in a refined division of labour. Among these actors, the more important ones are lawyers, agronomists, economists, water engineers, city planners, social workers, statisticians, systems analysts ....., geographers, architects, environmentalists.... and demographers'. (Friedmann 1987, p25)

This set of definitions imply that planning and construction should be conceived more as processes than the production of

artifacts. It is the process of planning at national, regional and city levels that influence the economic function and physical shape of the built environment. With earlier definition of process of construction as 'the production of the built environment', it is imperative that the relationship between planning and construction is realised.

At the urban level modern planning policies including zoning, density and conservation also influence the value and type of new buildings. Often vigorous planning regulation and practice dictate the type of technology or building material to be used. Regulations of this nature can cause increase in demand and shortage of some materials on a large scale. The import New Town movement to developing countries often caused property speculation and growth of city boundaries thus exerting further pressure on municipal authorities in provision of infra-structure. The implications of such policies on the construction industry at national level is significant.

1.3 HYPOTHESES

Arising out of the above discussions three hypotheses are postulated to direct and focus the conduct of the research.

HYPOTHESIS 1: There is a lack of realistic assessment of construction potentials in the setting up of Development Plans at National and Regional levels.

The implication of this hypothesis is that the importance of the contribution of the construction industry to the national economy is not fully realised. In this context the construction industry acts as constraint to development. If this is the case then more attention should be paid to the predicament and sensitivities of the indigenous construction industry as a vehicle for overall national development.

HYPOTHESIS 2: Choice of construction technology and resources is strongly influenced by economic and physical planning policies.

The implication of this hypothesis is that if I can demonstrate that planning policies have an impact on the choice of construction technology and materials, then the interactions between planning policies and construction technologies exist.

HYPOTHESIS 3: National Development Planning and Physical Development strategies have a direct impact on the performance of the Construction Industry as a whole.

The third hypothesis implies that what happens in the decision making process at the national level has a direct impact on the way the construction industry operates. This is more than a mere tautalogical reinstatement of the earlier two hypotheses. Conceptually it is dependent upon the earlier two hypotheses. It is concerned with 'ways and means' of how development planning strategies at the national level influence the construction industry performance/ output. If this is not the case then there is no valid argument for planning construction interactions (Pl.C.I).

1:4 METHODOLOGY

The research uses a combination of theoretical and empirical evidence from documentary sources, field research and questionnaire survey. The examination of development planning strategies in a number of developing countries whose economy is based on oil income ensuring a high profile government intervention, provides a basis for establishing a series of parameters in discussing the importance of the construction industry to overall development. This seeks to establish what kind of construction industries are implied by such planning strategies.

This is followed by a detailed analysis of the process of planning and construction in Iran to determine what kind of construction industry has been created by planning strategies in contemporary Iran. Diverse sources of information were used in such analysis. In the study of the planning process in Iran, emphasis was placed on the industrialisation policies pursued since the end of the Second World War. The examination of national development plans proved to be the best source, as they illustrated procedural, administrative and resource

utilisation of planning and implementation agencies. Evidence of field research is used to explain and analyse the operational aspect of the planning and construction process in Iran.

The long term aim behind this research is to facilitate the understanding of the complexities in planning and development. One useful way is to determine how appropriate development strategies have been, and how the construction industry has responded to achieving the targets set by such development strategies. The construction industry is referred as 'the main engine of development' by many reports produced by international agencies and development experts. How the construction industry operates under public and private sector dominance merits particular attention. In this context evidence of a questionnaire survey of a number of construction companies operating in Khorasan region of Iran is used to identify constraints to the effective function of contractors. Although the sample size was relatively small, participant observation of the nature of operation of construction companies in a regional context yielded a depth and richness of detail which compensated for lack of larger sample.

The research also embodies a study of planning and construction process in China and Japan. This is undertaken in order to establish how an appropriate construction industry can be created for an appropriate planning strategy, at the level of national economic development planning and physical development planning? On the surface there are more differences than similarities between the three countries.

The differences between Iran and China include, size, cultural specifics, administrative hierarchy and ideologies. Iran and Japan are again different on the same grounds and there has always been a technological edge in favour of Japan. The similarities in terms of their recent history however, provide a logical basis for comparison. Firstly the three countries have undergone major political upheaval in the aftermath of the Second World War. Secondly the three countries have been involved in wars and have also been subject to large scale devastation by natural disasters such as earthquakes and flooding. However the most common feature between the three countries has been the impact of foreign intervention, in the form of ideology, planning policy and transfer of technology. China experienced a particularly long period of both economic

and technological assistance programme from the Soviet Union immediately in the aftermath of the victory of the Peoples Revolution in 1949. Iran and Japan were at the same time experiencing foreign political and economic intervention of different kind based on western and largely American capitalist way of development. In this connection the research draws upon evidence from field research in China and examination of the necessary documentation on aspects of planning and construction in Japan.

The methodology chosen for the conduct of research is based on a dual discipline approach i.e combination of; empirical, theoretical, field research and participant observation against either a totally empirical or theoretical examination of the main hypotheses.

1:5 RESEARCH FINDINGS

The findings of the research are varied and to some extent contradictory. The implication of economic development planning and physical development planning strategies for the construction industry is increasingly recognised in different theories of development in the Third World thus supporting the first hypothesis. Under-estimation of potential of the private construction sector in capital formation, investment and production process is the most researched issue, thus this study draws upon evidence of such research.

The second hypothesis postulating the dependency of construction technology and resources upon the economic and physical planning policies is also found to be valid based on the close examination of the planning and construction process. The excessive industrialisation promotion policy, reliance on large scale projects against small scale industries and a distorted spatial distribution of such projects are found to be the cause for the failure of the construction industry in Iran.

However, the analysis of the planning and construction process in Iran, China and Japan provide somewhat contradictory evidence to support the third hypothesis. Apart from the Iranian case, the construction industry in both China and Japan ap-

pears to be operating along the lines that it has been directed. However although the Japanese situation immediately after the Second World War required strong government intervention in supporting the construction industry in administration, training and investment, the present situation is somewhat different. The current climate indicates a strong private sector dominated construction sector leading the way followed by government support in the form of modification of development and planning laws to boost the construction industry.

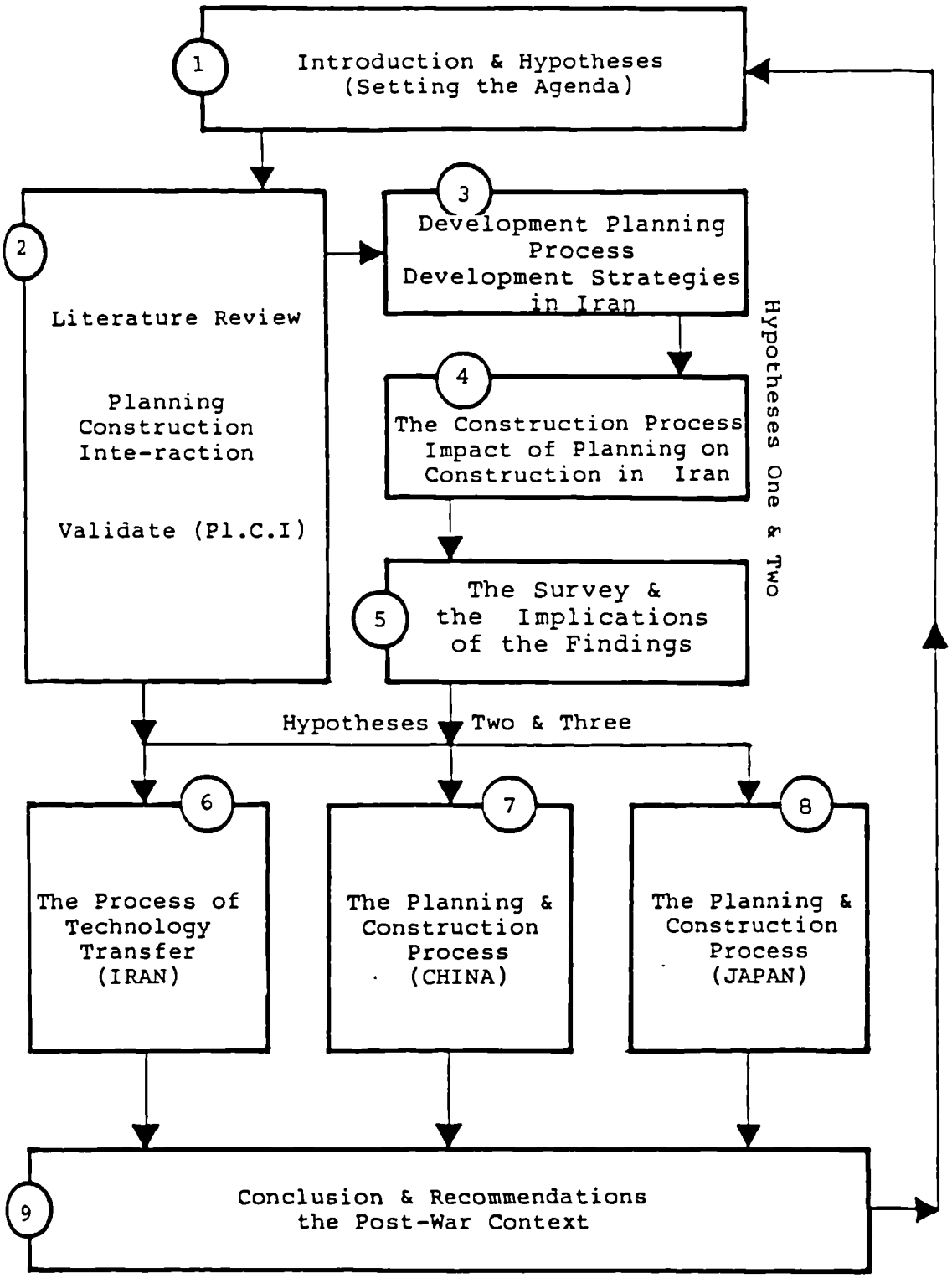
The study suggests that government support in strengthening the construction industry in Iran is essential and this should be directed at the support of the informal and private sectors. The research argues that economic development planning and physical development planning strategies determine the shape and nature of the construction industry. For Iran it is suggested that the aim should be to create an appropriate construction industry based on an appropriate planning strategy at the national level which pays due consideration to both material and human resources at the disposal of the country.

1:6 STRUCTURE OF THE THESIS

By defining what 'development' is chapter two provides discussions on two streams of planning i.e economic and physical development planning. This is offered by a review of recent literature on issues of development, urbanisation and planning at national, regional and city levels. Chapter Two sets out to demonstrate that with effective planning the construction industry can help the planners to realise the objectives of their development plans. Diagram 1.1 illustrates the structure and organisation of the thesis.

An examination of national development planning process is provided in Chapter Three to assess the role and impact of government actions on the planning process. This is followed by an analysis of the work of planning agencies including the Ministry of Plan and Budget (MPB), the Ministry of Housing and Urban Development (MHUD) and a number of newly established organisations both at the national and Regional levels.

Diagram 1.1 The Structure and Organisation of the Thesis



Chapter Four then presents an analysis of the construction process in Iran with particular emphasis on the rural and urban construction context. Whilst outlining the nature of the construction industry of the pre - revolution years this chapter closely examines the post revolution changes in the construction industry. This chapter also provides an analytical account of the technological, economic, material and human resources of the construction industry followed by illustration of the role of private contractors in project implementation.

Chapter Five deals with more detailed analysis of the work of private construction companies. This is illustrated by the analysis of a questionnaire survey of a number of construction companies operating in Khorasan province of Iran. The aim of this chapter is to identify operational constraints and to determine the impact of government economic development planning policies on the work of private construction companies in a regional context.

The chapter also examines how companies employ different construction technologies in order to provide a basis for developing the overall question of planning construction interactions.

Chapter Six provides an analysis of the process of construction technology *transfer at intra*-national level based on participant observation method. In examining the concept of appropriate technology this chapter draws upon contradictory findings of acceptability or unacceptability of appropriate technology in Iran. It is argued that the failure of appropriate technology is due to government actions in promoting prestigious image-led development projects at national and regional levels. In examining the process of technology transfer the chapter identifies a series of factors which determine the choice of construction resources and technology in urban and rural context.

Chapter Seven develops the analysis of the concept of appropriate technology drawing from the findings of field research in China. The breakdown of ideological and political relations with the Soviet Union created a fundamental challenge for the

Chinese development strategists. It was in the aftermath of the ending of economical and technological cooperation with the Soviet Union that the Chinese had to look within to find alternative solutions for national development. This era saw the birth of the concept of inter-mediate technology later referred as appropriate technology.

This chapter aims to find an answer to the third research question i.e 'how an appropriate construction industry could be created for an appropriate planning strategy, at the level of national economic development planning and physical development planning'.

In expanding the discussions on the development of an appropriate construction industry Chapter Eight undertakes a detailed examination of the Japanese planning and construction process. The aim of the chapter is to illustrate the importance of government role in development of the construction industry. It is argued that import of western or foreign technology is not necessarily undesirable providing it is tackled sensitively. In examining the planning and construction process in Japan the chapter proposes that government intervention in the form of investment opportunities, training and administrative support and diffusion of technology by strengthening both public and private sector research and innovative planning strategies has played an important role in establishing one of the most dynamic construction industries in the world.

Chapter Nine concludes the study.

The appendices provide further details of various issues treated in the main text. Appendices 1,2 and 3 provide country profiles on Iran, China and Japan indicating some statistical information and administrative data.

Appendix 4 provides more detailed examination of the National Development Plans between 1949 and 1978 focusing on planning procedure, the main strategies and investment allocations for various sectors of the economy.

Appendix 5 on its part discusses the process of economic planning and the preparation and implementation of development plans before the revolution.

Appendix 6 gives detailed account of the post 1979, institution of planning and procedure in Iran with particular attention to the role of the Parliament and various agencies at the national and regional level.

Appendices 7 and 8 provide further discussion on the work of various planning divisions of the Ministry of Plan and Budget and the methodological process of city planning and design.

Appendix 9 gives more details about the survey, and provides discussions about the design of the questionnaire, the relevance of the questions of the survey and distribution of the questionnaire. The appendix also includes a sample questionnaire.

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CHAPTER 2

2:1 Introduction

The aim of this chapter is to establish the validity of the concept of Planning Construction Interactions (PlCI).

This is approached by defining what development is and exploring the two streams of planning i.e economic development, and physical development planning. Then the chapter examines aspects of the construction industry with particular emphasis on its contribution to economic development, its importance in the development process and the central role it can play in the development strategy.

Subsequent to this conceptual overview, the nature of planning and development in developing countries is presented with an outline of ideological trends of development thought in these countries. It is argued that development planning in developing countries has been based on theories and principles developed in both capitalist and non-capitalist countries. In order to support this notion the approaches to regional planning in a number of developing countries are presented.

The first case is related to efforts at regional planning in Nigeria, especially through the development of the new capital at Abuja. The second example examines the socialist villages programme in Algeria, a policy adapted to discourage urbanisation and achieve decentralisation by development of rural areas. Cuba is selected as the third case in order to demonstrate the policy of spatial development for the creation of a "landscape of socialist integration". It is argued that although this was an attempt at rural development the result has been one of "positive urbanisation". The last example concerns a brief indication of Chinese experience of development through the policy of decentralisation and reduction of urban rural differences with the use of indigenous resources and reliance on appropriate technology.

Finally and arising out of lessons from the foregoing sections concept of appropriate technology as a possible development strategy is fully explained. This gives an insight as to why various international agencies are involved with the development and promotion of Appropriate Technology (A.T).

2:2 Development Defined

It is difficult to define the term development, as it is used in different contexts. It may be used in contexts varying from the simple and limited, such as that of a housing development, to the much wider and complex context of national development (Almufti 1987). There are debates amongst people from different disciplines as to the exact definition of development. In its general form the term development involves social, cultural, political, economic, and technological dimensions. According to Seers (1969), in discussing the subject of development:

> "we have to dispel the fog around the word 'development' and decide more precisely what we mean by it"

In this respect, some well known dictionaries provide some linguistic definitions of the word development:

Roget's Thesaurus (1986) puts development as synonymous with production, expansion, progression and improvement. Collins Dictionary (1988) defines development as "gradual growth or formation". Longman's (1987 New Edition) definition of development is "the act of developing or the process of being developed (advanced)".

In his approach to defining development Seers (1969) is of the opinion that:

> "the starting point is that we cannot avoid what the positivists disparagingly refer to as 'value judgements'. Development is inevitably a normative concept, almost a synonym for improvement. To pretend otherwise is just to hide one's value judgements". (Seers 1969, p10)

It cannot be over-emphasized that what development implies for the developing countries is not simply an increase in productive capacity but major transformations in their social and economic structures (UN 1970, p5). On the same subject Paul Streeten, one of the most influential development specialists, remarks:

> "Development is not about index numbers of national income, it is not about savings ratios and capital coefficients: it is about and for people. Development must therefore begin by identifying human needs. The

> objective of development is to raise the level of living of the masses of the people and to provide all human beings with the opportunity to develop their potential." (Streeten 1981, pp195-6)

Development as a process has two main characteristics (Wallman 1977). Firstly, it is positive in its direction in that it is aimed at achieving a preferred state of affairs to the one from which it started. The process of development is therefore expected to include positive attributes in line with the instinctive drive, in individuals and societies (nations) alike, towards achieving the better. In this context it implies progress, which itself implies evolution towards some ultimate good (Wallman 1977). Secondly, the process of development is dynamic where criteria, targets, and methodologies may change as time passes and as internal (national) and external (international) conditions dictate (Almofti, 1987 p4).

The objective of development is to meet such needs as adequate nutrition and safe water, continuing employment, secure and adequate livelihoods, education, better medical services, shelter, cheap transport, and a higher and increasing level of measured income. There are other-non material needs, such as the desire for self determination, self reliance, political freedom and security, participation in making the decisions that affect workers and citizens, access to power, national and cultural identity, and a sense of purpose in life and work (Stretton 1986 p11). Much of this can be achieved in ways that do not increase the measured output of commodities, while a high growing index for national income growth can leave these basic needs unsatisfied (Stretton 1986, p11).

There are inequalities and rigidities in the social structure of many developig countries. These emanate from systems of land tenure, administrative hierarchies, educational systems and inadequate educational opportunities, external forces, and various traditional practices and customs (UN 1970). Within this framework, an increase in output or income only represents one of the indicators of development. It has to be supplemented by other indicators which bring more adequately the other dimensions of development.

The idea of development in developing countries surfaced only after the Second World War (Conyers & Hills 1983 p24). For a

long time it was assumed that the state of development to which the less developed nations should aspire was more or less synonymous with the type of society which existed in the developed nations (Conyers et al 1983, p24). Rostow, an economist who was responsible for some of the earliest theories of development, described this society as "a high mass consumption society" (Rostow 1960). This concept of development persisted more or less unquestioned in both developed and developing nations until the mid 1960s (Conyers et al 1983, p25).

The problems associated with rapid economic growth through industrialisation and inflation led to doubts about this type of development. In fact, according to Seers (1977):

> "This basically neo-classical paradigm had been already losing credibility in the 1960s. To generalise very drastically, the social problems of 'developed' countries were being rediscovered and concern was spreading about environmental costs of economic growth. The gap between the per capita incomes of 'developed' and 'developing' countries was apparently growing even in relative terms, despite large transfers of capital and technology". (Seers 1977, p25)

The new concept of development was most explicitly expressed in the Cocoyoc Declaration of 1974 by UNCTAD and UNEP:

> "Our first concern is to redefine the whole purpose of development. This should not be to develop things but to develop man. Human beings have basic needs: food, shelter, clothing, health, education. Any process of growth that does not lead to their fulfilment- or even worse, disrupts them, is a travesty of the idea of development". (Cocoyoc Declaration, in Ghai 1977, p6)

The most important use of development indicators is to provide the targets for planning (Seers 1969, p21). Such targets should include poverty, employment and income distribution, thus specifying some of the dimensions of the structure of society that the plan is aimed at. In order to achieve development most developing countries have given prominence to the role of development planning. Planning has now become an accepted fact of the economic and social life of most contemporary developing nations (Todaro, 1971).

Chapter One provided different definitions of planning as advocated by different theorists and planning scholars. There are two main streams of planning, that of economic development planning and that of land use (physical) planning (Conyers & Hills 1983). The following section will extend discussions on the main streams of planning.

2:2.1 Economic Development Planning

> "Countries were considered to be engaged in development planning if their governments were making a conscious and continuing attempt to increase their rate of economic and social progress and to alter those international arrangements which were considered to be obstacles to the achievement of this aim. (Waterston, 1965, p27).

Waterston (1965) classified planning activities into four broad categories: war-time planning, town and country planning, anticyclical planning and development planning. The last of these categories, i.e 'development planning' is thus referred to as 'economic development planning'. Economic development planning in many developing countries is a post-war phenomenon (Conyers et al 1983, p42). This occurred as the result of the desire to achieve development. Planning was seen as a means of accelerating the process of economic development (Conyers et al 1983, p42). Todaro's definition of economic development planning is:

> "Economic Planning may be described as the conscious effort of a central organisation to influence, direct, and, in some cases, even control changes in the principle economic variables of a certain country or region over the course of time in accordance with a predetermined set of objectives." (Todaro 1971, p1)

As already implied in the previous section the whole concept of development planning underwent drastic changes in the mid 1960s. The main concern was the lack of attention to the social aspects of planning in most of the developing countries, particularly the middle income countries where rapid economic growth had resulted in unequal distribution of wealth amongst the different sections of the poulation. This was demonstrated by Jan Tinbergen's concern that:

> "development has both social and economic components" (1967).

Further criticism was made of 'comprehensive plans'. In discussing the merits of development planning before the mid-1960s Conyers et al (1983) argue that:

> "The other important aspect of development planning at the time was its methodological approach. This approach could be criticised on a number of counts. Firstly, there tended to be far too much emphasis on simply writing plans or vetting projects". (Conyers et al, 1983, p46)

This preoccupation manifested itself in simply producing some kind of document for a specific number of years. This is best illustrated in the next chapter when an analysis is made of the process of economic development planning in Iran since the end of the Second World War. Conyers' second criticism of the nature of planning at the time is:

> "such plans were rarely 'operationally oriented' and no real attempt was made to consider how they might be implemented. Indeed, the gap between planning and implementation was, and still is, one of the major shortcomings of planning in the D.Cs." (Conyers et al 1983)

In Killick's view economic development plans were excessively rigid and thus counterproductive (1981). Short term planning was overlooked by a preoccupation with medium to long term planning. Other constraints were the result of the problematic nature of the relationship and interactions between politicians, planners and the conventional administrators. This was called 'the basic triangle of forces' by Seers. In his view:

> "though each of this trio may play his role quite reasonably by his own lights, the outcome is often nonetheless quite irrational because of basic differences in the way they approach their joint task, due to differences in the education and experience which have moulded them". (Seers 1972, p20 cited in Conyers et al 1983)

This brief overview of the process of economic development planning concludes discussions on this aspect of planning. The

use planning (Conyers et al 1983, p55) and design issues but is increasingly expected to be part of the integrated development approach.

There will be further discussions on detailed aspects of the physical planning process in the developing countries in later parts of this chapter. The following section continues the discussion on the integrated development planning approach.

2:2.3 Integrated Development Planning

The conventional approaches to planning resulted in significant changes in the scope of development planning. This changed planning concept was to include not only economic aspects, but also take into account social, political and physical environmental considerations. In integrated development planning all aspects of development are taken into consideration. Integrated development programmes should therefore take full account of the close relationship between economic and social factors and the interdependence between the various sectoral sub-processes of development in:

> "a. analysing the existing impediments to socio-economic change and progress;
> b. formulating development goals and objectives; and
> c. planning practical measures needed for promoting developmental change." (UN 1978).

Owing to their multi-faceted approach to development analysis and planning, integrated development programmes typically comprise several sectoral project components designed to be mutually supportive and/or functionally interrelated. Thus integrated development planning is an interdisciplinary approach that bridges the gap between economic development planning and physical planning.

It has been attempted in the previous parts of this chapter to provide a brief introduction to different facets of planning in order to provide a basis for the establishment of the concept of Planning Construction Interactions (P.C.I). The discussions so far have revealed the evolution of the process of development planning practice in the developing countries. These revelations have indicated changes in the approach to planning practice through the years.

These changes include the shifting away from the conventional economic development planning of the pre-1960s to the neo-classical thoughts of the 1970s and finally to the current thinking of integrated development planning. It was also pointed out that these changes occurred as the result of crisie in planning. These crises were the result of too much emphasis on purely economic aspects of development and the rigidity of the traditional master plan approach to physical planning. The situation was further complicated by the fact that most planning ills occurred as the result of the neglect of resources at the disposal of planners in most of the developing countries. As planning has become involved in the formulation of housing policies, the location of rural services, and the distribution of development activities at local, regional and national levels, then effective utilisation of resources in planning and implementation of such plans becomes particularly vital.

The calls for new approaches to planning and implementation of development plans include a more realistic approach in appropriate design, technology and use of resources. In this respect the construction industry in developing countries plays a significant role not only in the production of the physical environment but also in its contribution to socio-economic aspects of development, including employment generation. The following section will embark on detailed examination of the role of the construction industry in national development.

2:3 The Construction Industry and its Role in the Development Process

The development process embodies the production of space in the form of both buildings and sites for various activities (Healey, 1988). The development process itself is affected by the actions and relationships of various agents. One of the most critical contributors to the development process is the construction industry. In Chapter One the construction industry was seen as the sector involved in the production of physical evidence (Turin 1976, Moavenzadeh 1975 and 1980). Such evidence includes houses, roads, bridges and physical/social infra-structure.

The rapidly deteriorating situation of both the urban and

rural areas of many developing countries has brought about calls for changed attitudes in planning the development programmes of these nations. The United Nation's International Year of Shelter for the Homeless was the most significant contributor in bringing the attention of many governments to the problems of housing.

> "Human settlements, by definition, occur where people are: to live, to work, to enjoy themselves..... Human settlements are the most visible (because physical) and among the most permanent (because of technology we use) manifestations of society: of its conflicts, its failures and successes..... In fact, human settlements are so deeply embedded in the society which produces them that it becomes idle to speculate whether they are a cause (or tool) or an effect (or consequence) to development". (Turin 1976, p141)

Most developing countries face a serious urbanisation problem which is caused by many factors: generating factors and manifestations (consequences) which together form a chain of interlinked factors characterising the urban condition. The main factors could be listed as demographic, economic, political, social, environmental and technological (Taylor & Williams 1982). People are pushed into urban areas as the agriculture declines (TWPR 1988). This in turn causes a very low standard of living made worse with a lack of services and infrastructure (Rondinelli, 1983).

The most critical set of social factors is the low level of education, health and related social services in developing countries. Another factor influencing the development efforts in developing countries is the impact of imported technology in civil engineering, transport, health, and management. More than any other expert Turin pioneered studies of the construction sector in the 1960s until his sudden death in July 1976. He considered that the construction sector played an important role in the process of economic development (Drewer 1978, p47-51). Other people belonging to the Turin School have since contributed significantly to this paradigm. Turin's effort culminated in organising the Vancouver Habitat Conference and as the result of his persistence attention was focused on the notion of "human settlements" and, more specifically, the situation in the developing countries.

Thus in the 1970s there was an emergence of awareness on the part of many international agencies and national governments of the importance of the construction industry and its role in national development. As a result many international agencies, including the World Bank, have directed their development assistance to the construction sector in many developing countries. For example, between 1980-82 some 44% of the total cost of projects approved for assistance by the World Bank and its affiliate, the International Development Association, went for construction work (The World Bank 1984). Nevertheless, despite the fact that the construction sector occupies an important place in the economy of all countries and plays a dynamic role in the process of growth and development, it is an industrial sector that is all too frequently ignored by economists, planners, administrators, politicians and others concerned with development issues. As Wells (1986) points out:

> "the development literature is full of books on agriculture, mining, manufacturing, transport, trade and services, and yet there are few books on the subject of construction".

The 1980s have also witnessed a revival in the debate about the appropriacy of planning and design, particularly in the field of housing and infrastructure provision. This in turn has focused the attention of many people on the role of construction in developing countries. These experts still draw on Turin's experience. The aim of the present UN campaign for realistic programmes and ~~on~~ emphasis on construction as prerequiste for the success of such programmes is based on Turin's identification of ten major problems (TWPR 1987, pp 201-204). Turin's ten problems were:

> "obsolete or irrelevant codes and regulations; insufficiency of knowledge of local resources and local materials; the inadequacy of transport facilities; a shortage of relevant skills; the alienation of highly-skilled personnel; the irrelevance and inflexibility of many contract practices; the question of labour-intensive or capital-intensive methods; the shortage of capital; and the lack of effort devoted to research, development and dissemination of information." (cited in TWPR 1987, pp202)

Regrettably, despite sustained efforts on the part of organisations and individuals in many parts of the world, the same problems are frequently to be found today besetting the developing world's construction industry (TWPR 1987, p202). The construction industry is an essential contributor to the process of development. The physical evidence of construction can be found in the form of public infra-structure, roads, dams, irrigation works, schools, houses, hospitals, factories, and other construction works. These should be considered as the physical foundations on which development efforts and improved living standards are established. There are books which have been written by scholars such as Ganeson, Edmonds, Bhala, Groak and others dealing with the industry, but they fail to tackle the importance of construction as the most important issue regarding development.

2:3.1 The Contribution to the National Economy

The construction industry occupies an important role in any country's economy. It provides an appreciable share of the Gross Domestic Product and generates a high proportion of the gross fixed capital formation. According to Turin (1967) five main parties were involved in the building/construction process. These included "the user, the client, the professions, the building or contracting organisations and the manufacturer of building materials and components". The contribution of these five parties collectively to the Gross Domestic Product (GDP) equalled between 15-20%. The construction industry plays a major role in economic development in the less industrialised countries since it constitutes a significant portion of both Gross National Product and of employment. However, a major difficulty in making a quantitative study of the construction industry is a lack of accurate, detailed, and comparable data. This is undoubtedly in large part due to the diverse nature of the industry in terms of its:

a) large size;
b) fragmentation;
c) geographic and product-type dispersion;
d) reliance on a labour force, materials, and equipment which are widely used by other industries;and
e) association with numerous ancillary industries.

In developing countries in particular a fluctuating demand

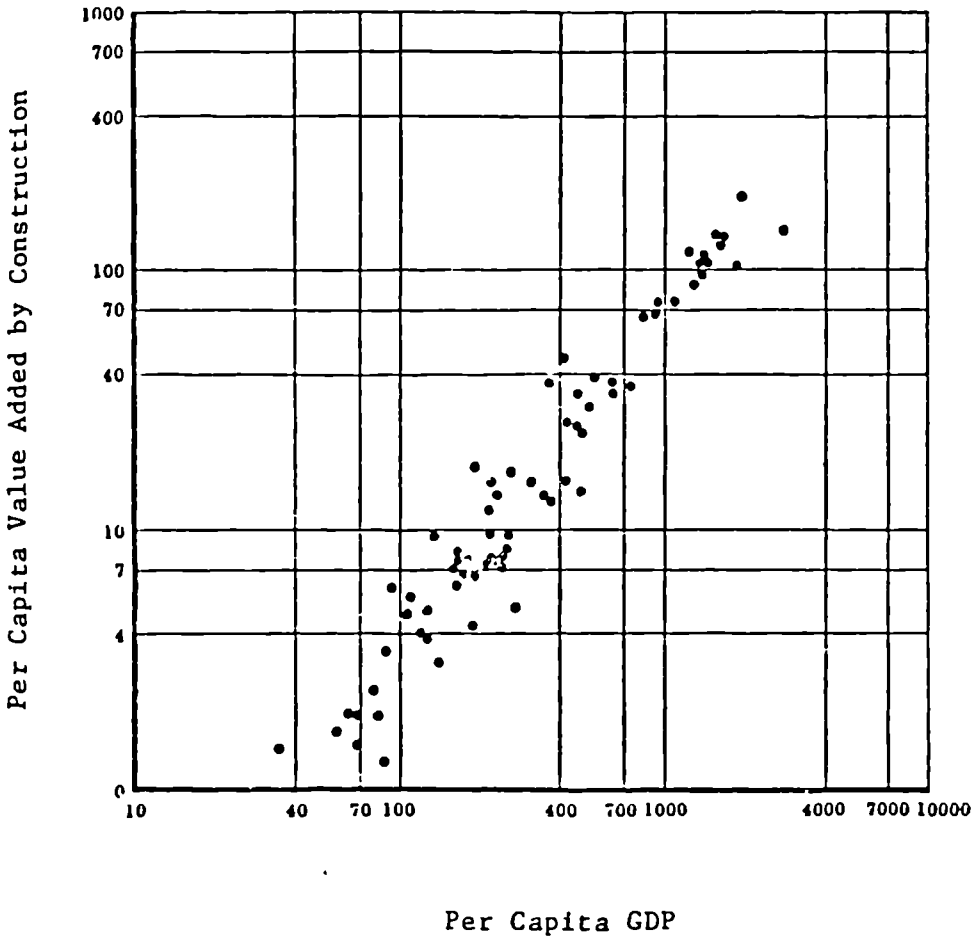
market impairs statistics. The market may be distorted by single but large projects and construction's sensitivity to political and economic uncertainty, along with the fact that it is difficult to determine the contribution of the non-monetary sector of construction. It should be noted that the world resources for construction are not distributed evenly among countries at different economic levels (Table 2.1).

Countries with a per capita Gross National Product (GNP) of $700 or more accounted for nearly 88% of construction in the world in 1965, (UNIDO 1969). In 1965 almost 40% of the world's Gross Domestic Capital Formation (GDCF) in construction of 230 billion dollars was in North America alone. The data shows a strong positive correlation between the per capita value added in construction and per capita Gross Domestic Product (GDP), (Diagram 2.1). A similar relationship seems to hold for per capita GDCF in construction and per capita GDP, although here it is per capita total GDCF which increases with increasing per capita GDP and not construction's share in total GDCF (UNIDO, 1969 p.9). According to the United Nation's study, the value added in construction represents between 3 and 5 per cent of the GDP in most developing countries and between 5 and 9 per cent in most developed countries (Table 2.2). The table substantiates this and further suggests that on the average construction's share over the years in developed countries has been falling while it has been rising in developing countries.

In order to substantiate the contribution of construction to economic growth it is essential to compare it with other sectors of the economy. For example,in agriculture and manufacturing, since the mid-sixties , economic growth in the developing market economies has been significantly higher than that in developed ones (Table 2.2 and Diagrams 2.2 and 2.3). It seems that construction's role in economic growth is significant in both developing and developed countries. During the development process economic growth is high, and construction, along with manufacturing, plays an increasingly important role while agriculture's importance declines. Once a relatively high level of development is achieved, however, economic growth appears to slow a little, and the role of construction stabilizes or even declines while the other sectors continue as before (Moavenzadeh & Rossow 1975, Brownrigg 1974).

Furthermore regression analysis for 116 countries indicates that GNP per capita explains 90 per cent of the variation in

Diagram 2.1: per capita value added by construction* and per capita GDP, 1963, (U.S dollars)



* average percentage contribution of construction to GDP 1960-1965 multiplied by per capita GDP in 1963.

Source: Moavenzadeh F and Rossow J.A.K, The construction industry in developing countries. Cambridge, Mass., Technology Adaptation Program, Massachusette Institute of Technology. TAP Report No. 75-4. Spring, 1975, p11.

Diagram 2.2:Index number of GDP$, for the economy as a whole and certain sectors in developed market economies.

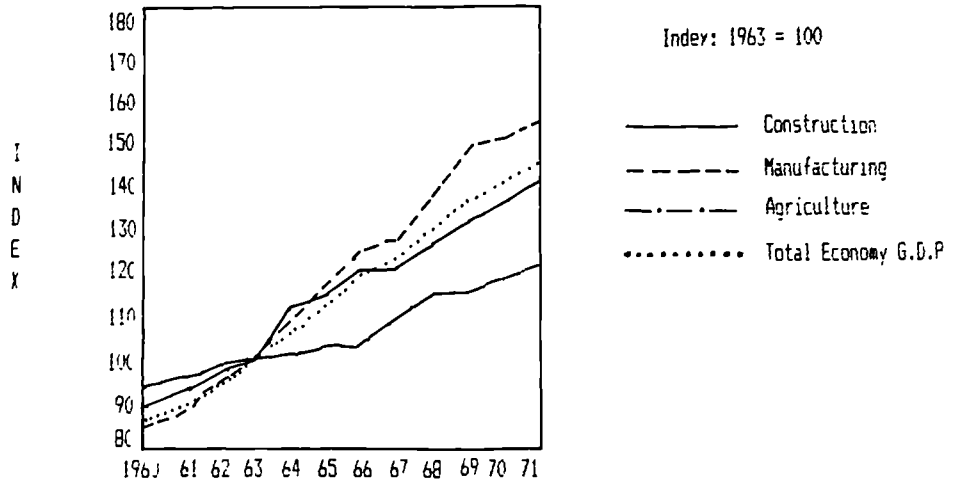
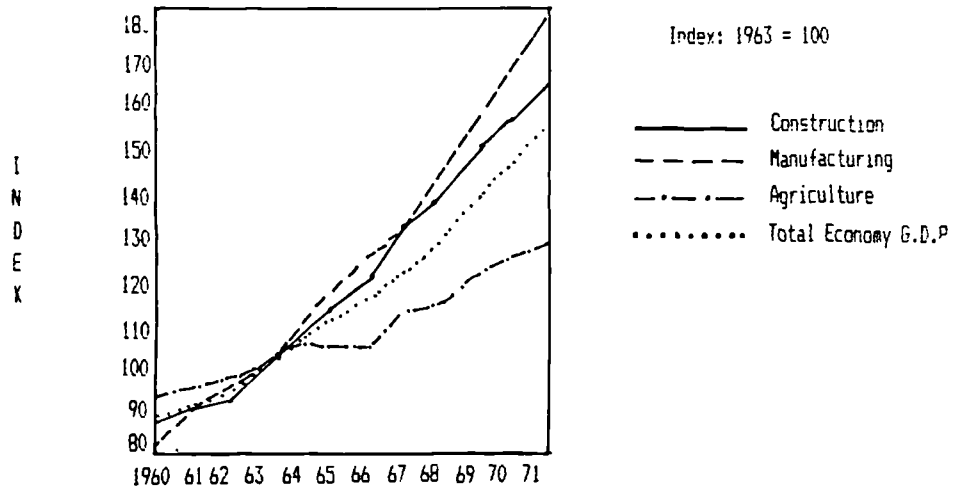


Diagram 2.3:Index number of GDP*, for the economy as a whole and certain sectors, in developing market economies.



$ Average annual growth areas at constant prices (per cent)
* Index numbers were compiled as weighted averages of country indexes of gross product at 1963 prices. The country indexes are generally derived from official estimates of GDP at constant prices by a kind of economic activity in terms of the former SNA.

Source: U.N Industrial Development Organisation, Construction Industry, Monograph No.2 UNIDO Monographs on industrialisation of D.Cs, based on the proceedings of the International Symposium on Industrial Development (Athens November-December 1967), U.N New York, 1969, ID/40/2. Cited in Moavenzadeh et al 1975.

Table 2.1: World estimates by income groups and by regions, of (a) value added in construction and (b) gross domestic capital formation in construction, for 1965.

(billions of U.S dollars)

Income groups by range of per capita GNP in U.S dollars	North America		Oceanic		Western Europe		Eastern Europe		Latin America		Middle East		Asia		Africa		Total all Regions		% of world Total	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
I. 2,000+	34.2	90.7			2.2	5.1					0.1*	0.2*					36.5	96.0	33.4	41.8
II. 700-2,000			1.8	3.2	27.4	43.8	23.9*	41.8*	1.2	2.7	0.3	0.6*	4.8*	8.9*			59.4	106.0	54.3	46.1
III. 400-700					1.3	3.1	1.3*	2.4*	1.0	2.1	—	0.1*	0.1*	0.2*	0.7	1.2	4.4	9.1	4.0	4.0
IV. 120-400					0.6	1.1	—	—	1.2	2.5	0.2*	0.3*	0.8*	1.6*	0.6	1.3*	3.4	6.8	3.1	3.0
V. under 120									—	—	—	—	5.2	10.9	0.5	1.0	5.7	11.9	5.2	5.2
Total all Groups	34.2	90.7	1.8	3.2	31.5	51.8	25.2	44.2	3.4	7.3	0.6	1.2	10.9	21.6	1.8	3.5	109.4	229.8	100.0	100.0
Percentage of world total	31.3	39.5	1.6	1.4	28.8	25.3	23.0	19.2	3.1	3.2	0.6	0.5	10.0	9.4	1.6	1.5	100.0	100.0		

a Data relates to 75 countries.

* Crude estimate.

Source: United Nations Industrial Development Organisation, Construction Industry, Monograph No.2, UNIDO Monographs on Industrialisation of Developing Countries, Based on the Proceedings of the International Symposium on Industrial Development (Athens, November December 1973), U.N., New York, August 1973, ID/WG 149/6.

* Cited in Eted Mavenzadeh and J.N.K Rosow, The construction industry in developing countries, 1975, TAP Report, M.I.T.

Table 2.2: GDP and its distribution among various sectors of the economy, by economic grouping, for 1953 to 1968.

Economic grouping and year	GDP in purchaser's values * (billions of U.S dollars)	Per capita GDP in purchaser's values (U.S dollars)	Average percentage distribution of GDP among the sectors of the economy #			
			Primary	Secondary		Tertiary
				Construction	Manufacturing	
Developing market economies						
1953-1955	na	na	42.1	3.6	14.2	40.1
1959-1961	184.1	140	39.8	3.7	15.7	40.8
1966-1968	255.1	180	36.1	4.0	17.4	42.5
Developed market economies						
1953-1955	na	na	12.3	6.0	28.9	52.8
1959-1961	943.7	1500	11.6	5.9	29.1	53.4
1962-1968	1628.1	2370	10.2	5.6	31.1	53.1

* For middle years, ie. 1954, 1960 and 1967.

The percentage share is calculated on the basis of a three year average of GDP at constant factor cost. The primary sector includes agriculture, forestry, and fishing; mining and quarrying; and electricity, gas, and water. The secondary sector includes manufacturing and construction. The tertiary sector includes commerce; transport, storage, and communication; services; and all other not included elsewhere.

Source: United Nations Industrial Development Organisation, Industrial Development Survey, Vol.5, U.N New York, 1973, ID/107.

and;

United Nations, Statistical Yearbook, Department of Economic and Social Affairs, U.N., New york, various years.

value added per capita. Edmond and Miles (1984) suggest that the construction activity is mainly a reflection of the needs of the population rather than being strictly related to the growth of the economy. In Drewer's opinion;

> "various researchers have stressed the clearly defined relationship between construction output and the level of economic development" (Drewer, 1980).

Whilst not disputing this relationship, he criticises the assumption that construction is therefore an important (and independent) determinant of economic growth, and suggests:

"this causal relationship may have been wrongly interpreted". (Drewer, 1980)

Estimates of the rate of change of construction output compared with the rate of change of GDP show no such clearly defined relationship, supporting the proposition that construction output is dependant upon GNP rather than vice versa (Drewer 1980).

Edmonds and Miles (1984, p3) argue that the danger in assuming that construction inspires economic growth is that government will invest even more heavily in the industry in the hope of achieving such growth. The evidence, however, suggests that a rapid growth in construction output is associated with a disproportionate increase in the importation of construction materials. It diverts scarce domestic savings from other productive sectors and imposes additional inflationary pressures on the economy. Although it is hard to argue with this view, it depends very much on the economic environment and more significantly on the priorities of the planning of the industry's objectives and the resources at its disposal.

The increase in construction demand even in a technologically developed country (U.K) has led to a dramatic increase in imports of construction materials resulting in a trade deficit in building materials of £2 billion (The Guardian 1988). This occurred as the result of huge building programmes such as the £4.7 billion Channel Tunnel project, the London Dockland's Canary Wharf development, estimated at £3 billion, and many other new road, house and commercial property construction. Shortages of construction materials and the failure of domestic suppliers to meet the increased demand, resulted in the

importation of many basic items. For example, the traditional yellow London bricks for Greenland Passage in the Docklands were imported from Denmark.

As will be demonstrated in the later stages of this thesis, all this depends on the design, specification, location and type of materials to be used, and on the methods of construction to be employed.

2:3.2 The Contribution to National Income (Value Added Construction)

Value added by construction is the difference between the value of sales at market prices and the market value of all current prurchase excluding the value of purchased building materials and components, fuel, transport, professional services, insurance and legal fees (Wells 1986). Hence it measures the value that an industry has added to the bought-in materials and components by its processes of production. The value added in construction expressed as a percentage of the Gross Domestic Product (GDP) varies from one group of countries to another, as can be seen from the fourth column of Table 2.3. The full range of the variation for individual countries is between 1 per cent and 11 per cent. Turin (1972) found that this percentage increases as per capita GNP rises. The table confirms this and also shows that the increase is not linear. In countries with a per capita GNP of less than $300 the average value added in construction is 4 per cent of GDP, whilst in those countries with a per capita GNP of $2000 or more it is over 6 per cent. In the middle income countries, however the average value added seems to be between 5 and 5.5 per cent of GDP, which suggests that the construction sector tends to take off when per capita GNP rises above $300.

Whilst the proportion of GDP formed by the value added in construction varies, on average over a small range, the actual value added per capita has a very wide relationship to GDP. Tables 2.3/2.4 indicate the scale of this variation in that the least developed countries have an average value added of only $6 per capita whilst the developed countries have an average of over $260. This determines that there is an imbalance in the construction activity between the different levels of GNP per capita.

Table 2.3 : Characteristics of the construction industry, around 1974

GNPper capita $	No of countries	VAc per capita $	VAc as% ofGDP	GFCFcper capita $	Investment per work-place $	Persons employed per1000 population
(1)	(2)	(3)	(4)	(5)	(6)	(7)
<300	30	6.1	3.95	16.4	2930	4.9
300-499	17	22.0	5.64	40.6	4094	6.5
500-999	18	45.9	5.32	62.0		14.3
1000-1999	9	77.6	5.01	161.0	6980	23.3
2000+	23	263.2	6.30	552.0	18584	28.0

Source: As appeared in "The Construction Industry in Developing Countries", Geoffrey A. EDMONDS 1979 p358.

Table 2.4 : Characteristics of the construction industry, around 1979

GNP per-capita $	Type	No of countries	VAc per capita $	VAc as% ofGDP	GFCFcper capita $	Investment per work-place $	Persons employed per1000 population
<500	A	30	13	4.66	19.5	6518	3.6
500-999	B	23	44	5.62	99.7	10974	9.1
1000-1999	C	22	87	6.08	187.9	15437	15.3
2000-3999	D	15	239	7.49	490.6	23571	25.2
4000-8999	E	14	466	7.36	861.2	33787	25.4
>9000	F	12	919	7.80	1672.1	57489	26.9
Total			211	6.14	539.0		16.5

VAc= Value Added in construction.
GFCFc= Gross Fixed Capital Formation in construction.

Source: G.A Edmonds and D. Miles, Foundations for Change: Aspects of the Construction Industry in Developing Countries Intermediate Technology Publications 1984, p7.

According to Edmonds, in 1974 the total value added of 30 developing countries, with a total population of 1,120 million was some $13,750 million, whereas the construction industry of France whose total population is only 53 million, contributed $12,450 million to GDP. Turin (1973), in his work on construction and development, states:

> "(I) the share of construction in the national product and the value added in construction per capita grows with economic development;
> (II) the ratio of net output in construction to net output in manufacturing and the share of infrastructure in total construction output decrease with economic development.
> (III) value added per person employed in construction and employment in construction per thousand population grow with economic development, but with different rates of change.
> (IV) the gap between construction and manufacturing, in terms of net output per person employed and hourly earnings, tends to close with economic development; in the richer countries net output per man tends to be the same in construction and manufacturing, and hourly earnings are actually higher; but changes in productivity tend to be lower" (Turin 1973, P41).

Also Bhalla and G.A.Edmonds, in their work for the U.N argue:

> "the percentage value added in construction increases as the GNP per capita increases" (Bhalla & Edmonds 1983, p8).

According to Table 2.3 the least developing countries have an average value added per capita of only $13, against an average of over $400 for developed countries (Bhalla et al 1983, p9). It is more accurate to state that the percentage value added in construction is generally higher in countries with a high GNP per capita than in countries with a low GNP per capita. Whilst the value added as a percentage of GDP usually fluctuates within a limited range, the actual value added per capita has a very wide variation.

The backward linkages of the construction industry to other industries are quite strong and in fact represent a value which in most cases exceeds the value added by the construction sector itself. In his observations of a number of countr-

ies Moavenzadeh (1984) found that in average value added accounts for 45% of the total output value, and that intermediate consumption accounts for the remaining 55%. The backward linkages of the construction sector to the international economy is through the import of various construction materials and products.

2:3.3 The Contribution to Capital Formation (Investment in Construction)

The significance of the construction sector in the national economy is especially manifested by the level of investment in construction (Field & Ofori 1988). Gross Fixed Capital Formation is a measure of the additions to the stock of capital in a country (Edmonds and Miles 1984). This consists of buildings, plant and machinery and includes depreciation, repairs and maintenance expenditure. The construction sector provides an appreciable share of the Gross Fixed Capital Formation (GFCF). Recent statistics indicate that between 50 and 60% of GFCF or investment goes to the construction sector (Field et al 1988, p44). This happens in both the developing and the developed countries, and is relatively labour intensive even in the latter nations in the sense that it uses a larger number of workers per unit of output than most other industries, and as such is also an important employer.

In broad financial terms, the industry converts financial investment into physical assets such as industrial plant, buildings, roads and general infra-structure. The impact of infrastructure development and especially railway construction in America was particularly impressive. In Fogel's (1962 & 1964) view:

> "There is a high correlation between new railroad construction and both population growth and commercial activity. Illinois, Michigan, and Ohio, for example, experienced a marked increase in population, construction and manufacturing following the completion of rail lines within and across their borders". (Fogel 1962, p165)

Walter Isard's (1942) study of Transport Development and Building Cycles also showed the same trend much earlier. He noted that:

> "for the country as a whole, the undulations in indexes of total output seem to follow closely the cycles in railroad construction." (Isard 1942, pp90-112 cited in Fogel 1962)

The creation of fixed assets to enable other economic activities to take place is an extremely important aspect of the industry. The market in enterprizes in, or associated with the construction industry is, therefore, largely determined by the level of investment. The industry similarly plays an important role in the economic balance of trade. This is particularly so in Japan, Korea and recently China when their construction firms entered the international construction market (C.S.S.C 1988). In the developed countries the share of investment in construction is divided in the following manner:

a) a larger proportion of investment is allocated to renewing equipment as the industry tends to be more capital intensive, and
b) there is a higher proportion of repair and maintenance work.

Compared with this situation the share of investment earmarked for new construction is thus likely to be higher in developing than in developed countries (Edmonds, 1979). When comparing the construction industry in both the developed and the developing countries, although the percentage of investment devoted to construction is more or less the same, the per capita investment in developing countries is much smaller in absolute terms because the total population is much higher. In effect it is the way this investment is channelled that is different and vital. The way that this investment is put to use is by distributing it between the actual construction, stock renewal and equipment. Whilst the equipment consumes the smallest part in absolute terms, at the same time it depreciates very fast.

In many countries most of the materials and the equipment, together with a significant part of the expertise, is imported and, because much of the planning, design and implementation is carried out by expatriates, the construction methods are mainly equipment-based. This in part has serious implications as regards not only the foreign exchange cost of importing equipment in the first instance, but also the additional cost of importing fuel and spare parts to ensure that maximum use is made of it.

According to U.N estimates (UN Commission for Africa 1967 p.52,65), up to 60 per cent of all materials used in the construction industry in developing countries are imported, and it has been estimated that to reduce this reliance by 50 per cent,the total investment in construction would have to be doubled. The construction industry in both the developed and the developing countries is highly susceptible to government policy, mainly because in the public sector its activities and output are directly affected by the level of government expenditure and investment. Similarly, in the private sector as well central government action on interest rates, credit facilities and taxation effectively dictate the level of output. This trend can clearly be seen in the U.K as the result of the Conservative administration's policy to use the interest rates in order to fight inflationary pressures. The increase in the cost of borrowing i.e. the mortgage interest rates, has had a dramatic impact on the housing market. Since 1979 one of the main criticisms of the present administration by the opposition has been the lack of investment in the construction industry in the form of modernising the infra-structure, the housing stock and constructing new hospitals and schools. The construction boom, which has been evident for much of the 1980s, has been the result of different policies. Although much of the construction activity has been by the private sector, to a large extent this has been affected by government actions.

One of the main features of the late 1980s economic recovery in Britain has been through "property led urban regeneration" (Healey, 1988). The construction industry played an important role in this economic recovery (C.S.S.C 1988, p27-31). Others see this trend as part of the changing planning policy and practice (Brindley, Rydin & Stoker 1989). The most notable and relevant change has been in the form of 'leaverage planning'. Brindley et al (1989) define leaverage planning as:

> "the use of the public sector to stimulate a weak market and to release a greater volume of private sector investment" (p20).

The urban regeneration policies of the 1980s have been implemented by the establishment of Urban Development Corporations. The prime example of leaverage planning which has had a profound impact on the construction industry in the U.K is the London Docklands Development Corporation (LDDC), (Brindley et

al 1989, p21). Other critics argue that as an example "the Isle of Dogs was given over to the construction industry without the benefit of any planning at all" (The Guardian 1989).

As the governments in many developing countries have a more direct role and control over the economy and investment decisions, the investment in the construction sector takes up much more resources and at the same time is more dependent on government policy. The average investment level per capita in the most developed countries is no less than 85 times that for the less developed (Table 2.4), whilst the difference in GNP per capita is of the order of 30-40 times. The extremes were Norway and Ethiopia with a GFCF in construction per capita of $2070 and $6 respectively in 1983 (Bhalla & Edmonds, 1983). This correlation ie between GNP per capita and investment per capita, is extremely strong; 90% of the variation in investment per capita is explained by changes in GNP per capita and this reflects the more or less standard percentage of investment funds that most governments, both in the developed and the developing nations, devote to construction. The benefits of such investment will be in various forms of which employment generation is particularly important.

2:3.4 Employment Generation

Construction is a labour-intensive industry in all countries. The construction sector's manpower requirements are diverse and extensive, but a particularly important feature is the extent that it provides jobs for the semi-skilled and unskilled. For many rural households, seasonal employment in construction helps stabilise and augment income. In Halliday's view:

> "Construction is par excellence an area of underprivileged manual wage-earning employment: in the advanced capitalist countries of western Europe it is an area of primary concentration by immigrants (such as the Irish in England, and the Algerians in France), and employment is often of a casual and seasonal nature". (Halliday 1979, p183)

Within the construction industry, the housing sector especially retains the highest employment generation potential

(Ganeson 1983). In supporting the case of construction and the contribution of housing to national development Van Huyck argues:

> "The housing construction process itself can have a positive impact on other sectors of the economy. A dynamic construction industry is the sine qua non for successful development. Housing programmes can provide a major stimulus to the development of skills, entrepreneurship and capital investment needed to make the construction industry a major contributor to economic progress". (Van Huyck 1980, p2)

Figures on employment in the construction industry, as with other data, are vague, mainly because of the nature of casual employment (Bhalla & Edmonds 1983, p200), that is the movement of casual labourers in and out of the industry. This makes it extremely difficult to rely totally on the data indicating the levels of employment and unemployment. However, the ILO has perhaps the most comprehensive set of data (Bhalla et al 1983). Table 2.5 contains data of more than one hundred countries which have been collated by the International Labour Office. The data presented in Table 2.5 relate to GDP per capita; value-added in construction as a percentage of GDP; capital formation in construction (gross output) as a percentage of GDP; employment in construction as a percentage of Economically Active Population (EAP); and investment in construction as a percentage of GFCF. A closer look at the table reveals a wide range for figures relating to construction employment of between 0.1 per cent of the EAP in Nepal and 16 per cent in Libya. According to Wells:

> "the examination of such data reveals that employment in construction also increases from an average of 2.1% of the EAP in countries with per capita income of less than $350, to 3.4% in countries with per capita income of between $350-700, 6.7% in countries with per capita income of between $700-2000, and 8.1% in countries with per capita income of over $2000". (WELLS 1986, p19)

Evidence from different countries also shows that the construction industry can contribute to employment generation. For example, the House Building Corporation in Pakistan has estimated that for each 10,000 homes built in Karachi, 32,500 man-years of employment will be generated. Rapid development in-

Table 2.5. The Contribution of Construction to GDP, GFCF and Employment in Selected Countries.

Country	(A) Per cap GDP U.S Dollars	(B) Net Constn % of GDP (1977/79)	(C) Gross Constn % of GDP (1978)	(D) Employment % of EAP	(E) Constn % of GFCF (1978)
AFRICA					
Ethiopia	97 (75)	4 (74/86)	6.9	-	66
Lesotho	124 (75)	2 (64/74)	7.5	-	76
Upper Volta	126	4 (74)	12.1	-	46
Burundi	146	4	-	-	-
Niger	160 (75)	3 (69)	-	-	-
Zaire	172 (77)	4 (77)	11.3	-	38
Chad	172 (75)	3 (75)	-	-	-
Malawi	178	4 (72/73)	8.0	2.1 (77)	42
Rwanda	194	4	-	-	-
C.A.R	200 (75)	4 (70)	-	-	-
Yemen	215 (75)	1 (74/76)	8.0	4.7 (75)	78
Benin	221	4	-	-	-
Uganda	222 (75)	1 (74/76)	8.0	-	49
Tanzania	249	3	5.8	0.5 (67)	32
Madagascar	253	3 (72/74)	-	-	-
Siera Leone	283	3 (77/78)	8.2	-	65
Mauritania	353	4 (78)	-	-	-
Togo	353	7	-	-	-
Kenya	359	5	10.4	-	43
Senegal	361	4	-	-	-
Liberia	427	6 (76/78)	-	0.9 (74)	-
Tonga	464	4	-	5.4 (76)	-
Sudan	488 (77)	4 (76/77)	-	2.0 (73)	-
Zambia	495	5	15.5	4.4 (69)	59 (73)
Zimbabwe	592	3	7.9 (77)	-	58 (77)
Cameron	612	4 (76)	11.2	1.7 (76)	54
Egypt	628	5	-	3.5 (77)	-
Morroco	657	8 (76/77)	-	4.3 (71)	-
(Libya)	7262	10.5	-	16.4 (73)	-
Gabon	4425	10	-	-	-
Swaziland	707 (75)	2 (74/76)	3.9	-	-
Nigeria	717 (77)	9 (77)	18.5	-	63.8
Botswana	830	5	17.8	-	59.8
Ghana	913 (77)	4 (76/77)	8.9	-	66.8
Tunisia	981	7	15.6	8.6 (75)	58.9
Ivory Coast	1014	7	19.2	-	63
South Africa	1611	4	12.8	5.6 (70)	51

Table 2.5. Cont...

Country	(A) Per cap GDP U.S Dollars	(B) Net Constn % of GDP (1977/79)	(C) Gross Constn % of GDP (1978)	(D) Employment % of EAP	(E) Constn % of GFCF (1978)
ASIA *Excludes China & North Korea.					
Bangladesh	114	5	-	0.2 (74)	-
Nepal	121	7	12.3	0.1 (76)	73.7
Burma	133	1	-	1.4 (77/78)	-
India	187	5	9.6	1.2 (71)	54
Sri Lanka	196	5	7.5	3.8 (80)	42
Afghanistan	200 (75)	3 (74/76)	-	1.3 (79)	-
Pakistan	254	5	10.2	4.1 (78)	62.7
Indonesia	350	6	-	1.5 (78)	-
Thailand	512	5	10.75	1.5 (78)	43.7
Phillipines	536	7	11.2	3.3 (77)	50.9
Hong Kong	3140	7	11.8	7.8 (80)	53.6
Singapore	3328	6	9.5	5.2 (78)	32
Japan	8381	9	21	9.4 (78)	64
Mauritius	1012	8	23.0	8.2 (72)	66.8
Malaysia	1045	4 (73)	-	4.9 (79)	-
South Korea	1285	8	17.6	5.9 (78)	47
AUSTRALASIA					
Australia	8116	7	12.3	7.1 (76)	56
New Zealand	4838	5	12.1	8.8 (76)	59.8
Papua New Guinea	662	7 (74/76)	-	-	-
MIDDLE EAST					
Syria	1030	5	15.6	12.0 (78)	53.8
Iraq	1604	2 (74/75)	15.5	10.3 (77)	58
Iran	2209 (77)	9	-	12.3 (76)	-
Israel	3948	9	12.2	6.6 (78)	57.5
(Kuwait)	12711	4	-	20.0 (80)	-
U.A.E	19380	10	-	31.7 (75)	-
Jordan	865	6	22.3	13.6 (79)	56.0
Lebanon	989	3 (77)	-	-	-
(Saudi Arabia)	9284	14	-	-	79.7
Turkey	1161	5	13.7	4.2 (80)	61 (77)

Table 2.5. Cont...

Country	(A) Per cap GDP U.S Dollars	(B) Net Constn % of GDP (1977/79)	(C) Gross Constn % of GDP (1978)	(D) Employment % of EAP	(E) Constn % of GFCF (1978)
Latin America *Excludes Cuba, Jamaica, Trinidad					
Honduras	529	5	11.0 (75)	3.3 (77)	56 (76)
Guyana	540 (77)	7 (75/76)	-	6.2 (77)	-
Peru	657	3	6.3	4.2 (82)	56.6
El Salvador	684	5	9.1 (75)	5.4 (78)	39.5 (75)
Venezuela	3035	7	21.2	8.8 (77)	51.2
Puerto Rico	3707	3	7.8	7.7 (79)	57.7
Belize	757	6 (73/76)	10.9	-	38.0
Bolivia	762	5	8.2	5.5 (76)	46.0
Paraguay	886	5	13.2	4.5 (81)	51.7
Nicaragua	889	4 (77/78)	5.4	4.8 (77)	37.9
Columbia	914	4	9.3	2.9 (80)	50.0
Dominican Republic	918	7	13.5	2.3 (70)	61.0
Equador	968	7	11.8	4.7 (80)	48.0
Chile	1078 (77)	2	4.3	5.2 (80)	44.3 (76)
Panama	1343	6	13.7	6.1 (79)	59
Mexico	1393	6	11.9	4.6 (79)	54
Argentina	1448 (75)	4	12.4	-	59 (75)
Costa Rica	1654	6	-	7.9 (80)	-
Brazil	1675	5	-	6.7 (76)	-
Uruguay	1731	4	12.3	-	64.5
NORTH AMERICA					
U.S.A	9748	5	10.9	6.2 (77)	56.5
Canada	8720	6	13.2	5.9 (79)	61.5

Table 2.5. Cont...

Country	(A) Per cap GDP U.S Dollars	(B) Net Constn % of GDP (1977/79)	(C) Gross Constn % of GDP (1978)	(D) Employment % of EAP	(E) Constn % of GFCF (1978)
Europe *Excludes Eastern Europe, Albania and the Soviet Union					
Greece	3377	8	12.8	8.3 (77)	63
Ireland	3636	8 (75/76)	14.5	7.5 (77)	52.9
Spain	4019	8	12.5	8.7 (78)	56.7 (76)
Italy	4620	7	-	9.3 (78)	-
U.K	5624	6	8.8	6.3 (77)	48.9
Finland	7155	7	16	8.5 (76)	67
Austria	7670	8	14.5	9.3 (78)	55
France	8903	7	-	8.3 (78)	-
Netherlands	9337	7	12.3	10.9 (79)	57.7
Luxembourg	9723	10	14	9.1 (70)	60
Belgium	9855	8	14.4	7.3 (78)	68
Norway	10012	8	20.4	8.6 (78)	68.4
Germany	10444	7	12.8	7.2 (78)	57
Sweden	10934	7	11.4	6.9 (78)	60
Denmark	11168	9	13.3	8.0 (78)	60.5
Portugal	1816	5 (75/76)	8.8	7.9 (78)	62.7

Source: Rearranged version of Wells, 1986.

creases employment in the construction industry, as the case of Morocco suggests where employment in the private construction sector increased from 56,000 to 96,000 between 1960 and 1970 (Van Huyck 1980).

In 1976 there were reckoned to be 1.2 million Yemenis in Saudi Arabia, mostly in construction, and 200,000 Egyptians and 40,000 Tunisians in Libya in the same sector. In Iran, the construction workers were brought in from the Iranian countryside. Emplyment in construction rose from 336,000 in 1956 to over 900,000 in 1977, representing nearly 10 per cent of the total labour force (Halliday 1979, pp183-184). The annual increase of employment in construction averaged at 6.7 per cent between 1972-7. The number of people employed in construction in Algeria increased from 73,000 in 1966 to 502,000 in 1981 as the result of regional development through the Special Programmes (for detailed information on these refer to Nacer & Sutton 1987, pp129-168).

Other analysis carried out by the ILO, confirm that stable employment in construction increases with the growth of GNP. This growth is not uniform and it seems to level off above a GNP of $2000 per capita. According to Moavenzadeh (1984), in a survey of a number of countries, the expenditures for labour in construction ranged between 19-27% of the total value of construction in developing countries and was somewhat higher in industrialised countries. He came to the conclusion that:

> "labour is the second most important construction input resource". (Moavenzadeh 1984, P34)

The different labour categories include; unskilled labourers; craftsmen and skilled labour; administrative, clerical and secretarial; professional and management. The extent of the demand in construction results in the shortage of skilled labour, especially in the developing countries. The result of this in these countries, is therefore, reliance on foreign sources of labour supply, as occurred in the 1970s in the Middle East. Incompetent craftsmen and the Lack of skilled labour quite often leads to an inferior quality of construction work and wastage in materials and resources. This in turn could have a serious impact on the overall development of the country. The relationship between construction employment, choice of technology and the impact of planning will be discussed in the later parts of this chapter.

2:35 Construction Demand

Construction demand can be classified into three groups: residential building, non-residential building and civil engineering and infrastructure works. Different studies, including that of Reidel and Schults (1978), have revealed that in the case of developing countries, the distribution of construction work was, respectively 40% for residential building, 22% for non-residential building, and 38% for other construction. This emphasises the significant share of the housing sector in the construction industry in particular, and its role in national development in general.

Demand in construction is from both the public and the private sector. The public demand for construction is comprised of public works programmes and major projects of national importance, whilst the private sector demand is concerned with residential dwellings and some commercial activities. The demand in construction also depends on the stage and the extent of development in any country. In most developing countries maintenance work has a relatively lower share as most of the building stock is young in age and limited in quantity. The available data of a number of countries indicate a decreasing share of the maintenance work, which in turn implies neglect in maintaining the existing construction facilities.

Construction demand also differs in urban and rural contexts. With more reliance on industrialisation in many countries and the rapid urbanisation trend, urban construction forms the bulk of construction in many developing countries. Even the newly constructed dams and irrigation projects which are situated in the rural areas are in reality for the benefit of the urban areas in the form of electricity generation and drinking water in the major cities (Sakhteman 1989, Mofid 1987). Apart from a very few countries such as China, Zimbabwe and Cuba, the infrastructural development in the rural areas compared with that of urban areas is very modest.

Demand in construction is also influenced by the volume of investment allocated to other sectors of the economy. According to Moavenzadeh (1984, p17), the average share of construction in investment for most economies varies between 45 and 65%. The fluctuation of market conditions has an impact on construction demand over a long term. Depending on the politi-

cal conditions of the countries involved the overall level of investment differs. Therefore periods of political instability represent a drop in investment and hence construction in fixed capital formation tends to plummet. During such periods of uncertainty the private sector investment in construction decreases significantly and investment is viewed as risky. The political factors influence the performance of the construction industry even in the developed countries. In their recommendation for the construction industry in Britain, the Centre for Strategic Studies in Construction concludes:

> "Building needs a stable economic environment to bolster general business confidence.....building has demonstrated a remarkable ability to adapt to changes in the size and nature of demand.... its great flexibility causes weaknesses..... overcoming them and rising to the challenges and opportunities which lie ahead will be greatly helped by a continuation of policies aimed at stability and growth....". (C.S.S.C 1988, p82)

Demographical changes also affect the nature of demand in construction. Population movement in the form of migration from rural areas to urban centres and the resulting urbanisation places additional pressure on construction demand. Increase in population and the number of households both in rural and urban areas contribute to a large unfulfilled demand for construction.

2:3.6 The Construction Process and the Agents Involved

The previous sections referred to the development process as being the product of the cooperation of different agents. One of these agents was identified as the construction industry. In Chapter One the construction industry was defined as:

> The activity /process which embodies all construction related facets including the manufacture and distribution of construction materials, machinery and equipment, also the process of planning and design of projects including economic infra-structure (local roads, transport distribution, etc), social infra-structure (health care facilities, rural housing, etc) and implementation of plans.

As mentioned previously, Turin (1968) identified five main parties in the building process. This process is the combination of activities of various sectors and participants. These sectors can be listed as; the client sector; the construction sector; and the design sector. Each of these sectors in turn comprise different parties and professions.

There are other sectors which also contribute to the construction industry. These can be named as; the financial sector; the manufacturing and supplier sector; the regulatory sector; the information and education sector and, finally the research and development sector. Diagram 2.4 illustrates the typical participants in construction. Each of these actors play a vital role in the development process. The construction process because of its diversity is influenced by many factors includeing political, social and economic, and cultural implications. The impact of each of these factors on the construction industry will be examined in detail in Chapters Four, Five, Six and Seven.

This concludes the discussion on the facets of "construction", it has provided the reader with an examination of the nature of the construction industry, its importance in the development process and its contribution to economic development. The full use of the potential of the construction industry depends greatly on the type of planning and development strategy pursued by governments. The following section will focus on the type of strategies and options of planning and development as practised in different countries in the developing world.

2:4 Planning and Development in Developing Countries

In all societies the state is the institution that monopolizes force and thereby enforces order in the interest of those holding power. In nearly all contemporary societies, Capitalist as well as Socialist, the state has adopted an interventionist role in the economy and directs economic activity in accordance with the priorities of those in power (Halliday 1979, p20). Within the range of capitalist societies:

> "the economic role of the state is especially pronounced in developing ones, since the weakness of the indigenous burgeoisie has tended to draw the state even further into

> an economically executive position than has been the case in the more developed capitalist countries." (Halliday, 1979, p20)

The path of development of most of the developing countries has been modelled either on the 'capitalist' or on the 'non capitalist way of development' (NCWD) based on the socialist principles. Amirahmadi refers to the NCWD as:

> "NCWD offers a conception of development that goes beyond the prevailing socio-economic determination to include politics and class struggle as part of development process in those least developed Third World Countries where the 'revolutionary democrats' hold state power. (Amirahmadi 1987, pp22-46)

The NCWD strategy currently adopted by countries such as Angola, South Yemen, Mozambique and Ethiopia, was launched in the 1960s by development theorists and national liberation idealogues from socialist bloc countries, especially in the U.S.S.R. whose roots could be traced to writings of Marx, Engles and Lenin (Amirahmadi 1987, p23). Ulyanovsky was the leading theorist of NCWD and he believed:

> "...if contemporary humanity lived under the conditions of only two formulations - socialist and capitalist - the question of non-capitalist development would not have even arisen. Since this is not the case and a considerable part of humanity still lives in pre-capitalism or is just beginning to effect the transition to capitalism, the non capitalist path remains open to them, particularly to Asian and African countries where the capitalist structure has not become predominant". (Ulyanovsky 1978, pp52-59, cited in Amirahmadi 1987).

He also states:

> "In countries where capitalist development is in its early stages .... and where landed proprietorship and feudal survivals are predominant, the transition to socialism, naturally enough, has certain distinuishing features on the strength of which it has been termed non-capitalist development (1978 ,p60)

Other proponents of the NCWD included: Solodovinkov (1973),

Korionov (1975) and Rostovsky (1978). Korionov argued:

> "NCWD was part of the struggle for progressive social transformation and economic independence, a struggle to do away with domination of foreign capital". (1975, p102)

The conflicting strategies of development based on different ideologies imported from the west and the east have had a profound impact on the development process in these countries. This impact is most profound in the urban areas of the developing world (El-Shakhs & Amirahmadi 1984, Sutton 1978, Hauser 1979, Giddens 1985, Wilber & James 1982, Murray & White 1983). The rapid urbanisation of many capitalist developing countries in Africa, Asia, the Middle East and Latin America has been the product of uneven and dualistic development policies (Vallin 1979, Hauser 1982). As noted before such rapid urbanisation has in turn caused severe shortages of housing, infrastructure and basic facilities in these societies. The concentration of population pressure will cause:

> "the expansion of the natural carrying capacity of the ecosystem through organisational and physical changes to the environment, with both intended and unintended consequences and impacts on people and their habitat". (El-Shakhs & Amirahmadi 1984, p43).

According to Calhoun and Ahuja (1979), to a large extent, this manifests itself in the built environment, roughly as much of which will have to be constructed over the next several decades as now exists.

> "The bulk of this rigid long lasting construction is expected to take place in the LDCs, and more particularly in their exploding urban centres where all types of shortages and breakdowns in service systems are already acute". (Calhunn & Ahouja 1979)

The alleviation and reversal of this disastrous trend requires a high degree of commitment, greater coordination of actions, and true partnership in development and planning efforts at all levels. However, most developing countries lack the capacity to organise and plan extensive data collection, and to mobilise professional skills, capital resources necessary for improvement and construction of existing and new housing and infra-structural requirements.

However development planning policies differ in Cuba from those current in Mexico and many other Latin American or Asian countries. Whilst the Cuban planning policy is based upon communist principles with the added Cuban blend, the planning policy of, say, Thailand is based on the American planning system. It is not difficult to appreciate the difference in both the urban and rural areas in the two countries. Slums near the centre of many of the cities of the poor capitalist cities continue to exist, despite continuous bulldozing to clear sites for public institutions and private office and business development. This ends the brief review of the nature of development strategies adopted by developing countries; the following section will concentrate on the impact of planning policies on development.

2:4.1 The Impact of Planning on Development

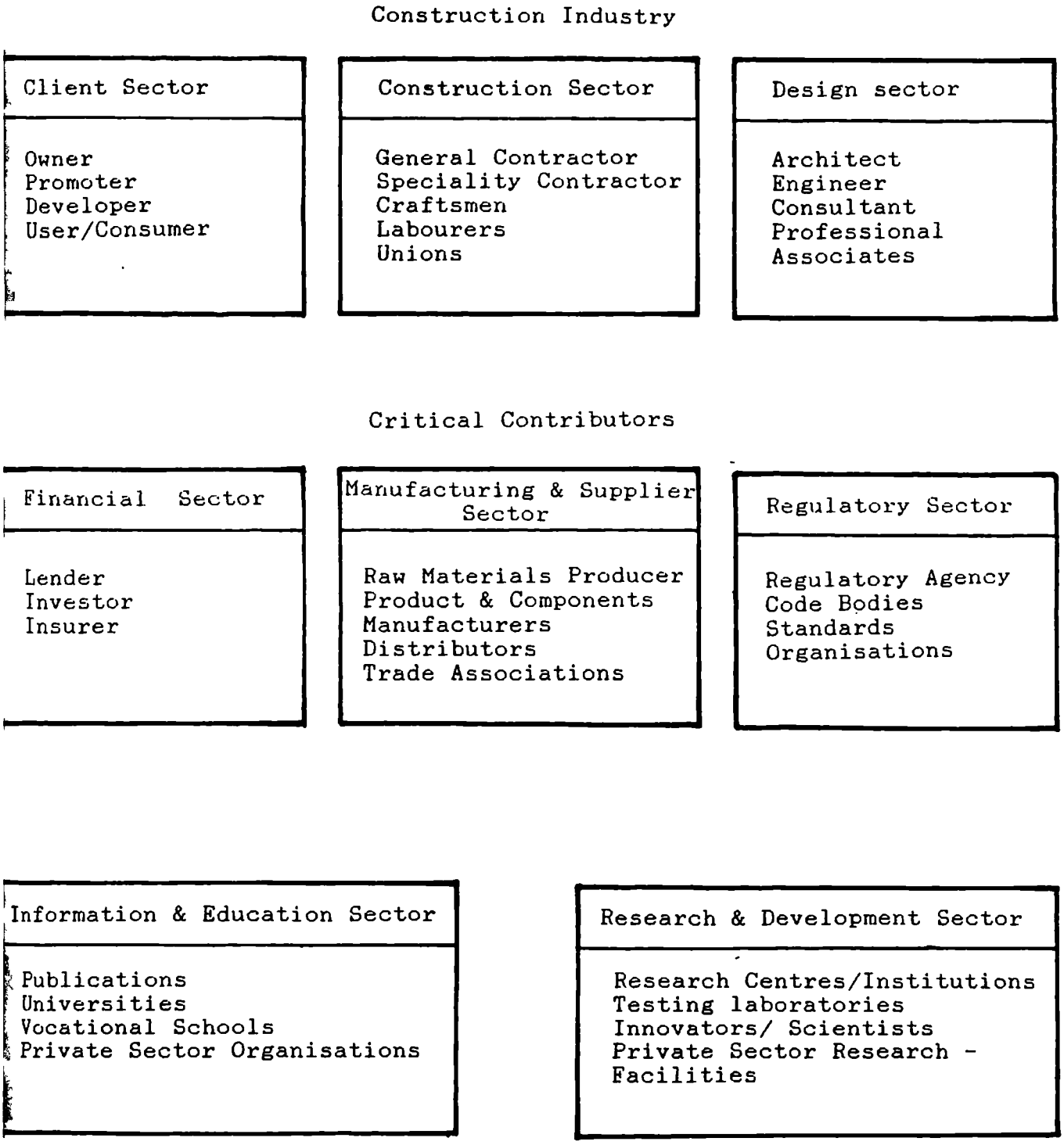
Planning and development in the developing countries is too vast and complex subject to be discussed in its entirety in this thesis. However a considerable pool of information and writing on this subject is available (Rostow 1978, 1987, Abu-Lughod 1977, Alonso 1971, Pacione 1981, Drakakis-Smith 1980, Gilbert & Gugler 1981, Ward 1974, etc), particularly from the 1970s when international concern over issues of urbanisation and the development gap in the Third World was at its peak with the publication of the Brandt Report. In 1981 Walter Bor in his keynote address at the PTRC summer annual meeting stated:

> "Of the present world population of 4 billion one fifth, ie, 800 million, live in absolute poverty and near starvation, nearly all of them in developing countries; one quarter of all babies born never reach their first birthday; and 19 million children die every year of preventable diseases".

He also notes that the Brandt Report does not deal with the implications of problems in terms of settlement policies, urbanisation, land-use or transport planning and the built environment. In Walter Bor's view:

> "much of the mistakes in development planning which have occurred in the developing world are the result of a series of ambitious and costly programmes, like major

Diagram 2.4: Agents involved in the Construction Process.



Source: The Construction Industry in Developing Countries. Vol.1 Contribution to socio-economic growth. UNCHS HABITAT 1984, Nairobi, KENYA, p21.

> urban motorway projects, financed by international funding agencies instead of inter-city road links which would have been more useful". (Bor 1981)

Some of these massive projects turned out to be not only unnecessary but even harmful. Vast sums of money and much effort were wasted in this way. The impact of 1960s' planning policies are particularly profound. Cohen (1987), a World Bank development specialist, notes:

> "the 1960s saw urban planners and architects, frequently expatriates, descending on Third World cities with multi-coloured master plans and grand designs. The plans prescribed modern urban economic and social behaviour and the built environment required to support it". (Cohen 1987, p1)

During this period plans for many cities were prepared, amongst them Bogota, Kuala Lumpur, Abidjan and new capitals such as Brasilia and Abuja, with provision for most modern services. Cohen further argues:

> "The plans presented the use of space; they were translated into building codes- frequently derived from former European traditions which assumed urban populations and incomes not unlike those of Marseilles or Atlantic City". (COHEN 1987, p2)

Since the late 1960s there has been some movement away from the traditional pattern in many developing countries. Although this shift has taken various forms, the predominant trend has been towards a planning model which is the opposite to the traditional master plan approach. This new approach puts the emphasis on formulating short term programmes which may or may not relate to a broader development strategy. The major planning tool "bulldozer" for urban renewal has been replaced by the policy of neighbourhood improvement through public participation. Long term master plans are being replaced by five year and annual project proposals which lead directly to action.

It can be said that generally the planning practice in developing countries has taken on a more of policy orientation with greater effort being made to formulate socio-economic programmes in addition to, or in conjunction with, physical develop-

ment projects. As already stated development planning has been based on different ideologies and principles.

Most of the strategies for national economic and physical development, such as the Comprehensive River Basin Approach, Spatial Development theories and Strategies, and Growth Pole Theory and Polarised Development, found their way to developing countries. At the same time new theories of regional under-development and dependency originated in the Third World as failure of development planning in a number of countries led to uneven development (Amin 1974). Such planning policies have made a significant impact on the built environment in these countries. For interpretation of each of these planning strategies the following section will focus on the role of regional planning in action in developing countries.

2:4.2 Regional Planning in Developing Countries

With the ever increasing urbanization and increase in population in many of the developing countries, there is much contradiction between town and countryside. This has called for policies to avert rapid urbanization and reduce polarization between urban and rural regions. This has come about as the result of a reaction to the "urban bias" of foreign aid and national development policies of the 1950s and 1960s, and the increasing poverty in rural areas of the Third World nations during the 1970s. In Weaver's view:

> "After the gradual decrease in public interest in regional planning in the 1940s up to 1950, and before its re-emergence in a different form in the 1960s in the west, most planning theorists turned their attention to the problems of urban and regional development in Third World countries, where there was more immediate interest in their ideas". (Weaver 1984, p113)

The policies emerged and employed in developing countries have been introduced in different forms. National development plans of most of these countries have emphasized the need to expand industrial development at both national and regional levels, to create an infrastructure and improve social services such as education and health. Regional planning in many countries has been seen as a means of achieving national development as a whole, and for this reason regional development has been

incorporated in five or ten year national development plans.

Regional planning in the form of comprehensive river basin development or spatial development and growth pole and growth centres has been widely experimented within countries such as Iran (Baldwin 1967), Ghana (Kalitsi 1971), Nigeria (Okafor 1985), South Korea (Amirahmadi 1988 & Lim 1988, Urban Edge 1989) and Egypt (Taylor et al 1982). In recent years successive Malaysian governments have followed Five Year National Plans, incorporated regional targets of economic growth, and introduced a comprehensive system of planning at local and regional level. A range of institutions has been created at both Federal and state levels concerned with the preparation, development and implementation of regional development strategies (Alden et al 1985 pp595-508). This shows clearly that the existence of a good planning system is a vital element of success in both promoting and implementing regional development schemes.

Amongst other countries China and Cuba have put great emphasis on rural development and Mexico, Nigeria and India have embarked upon a Federal Government system which is autonomous on any aspect of development. Other countries, amongst them Algeria, have embarked upon a spatial reconstruction of the economic landscape in the form of socialist villages. In most parts the large scale development and construction of dams, irrigation, road and other infrastructure facilities since the 1960s were the result of such planning policies.

For example, Iran's experience of comprehensive river basin development was based on the T.V.A experience (Halliday 1979, McLachlan & Spooner 1963, McLachlan 1988, Okazaki 1968, Mofid 1987, Amirahmadi 1986 & 1987). In the Iranian case it was in fact the New York based Development Resource Corporation (DRC) formed by David E. Lilienthal and Gordon R. Clap, both of the Tennessee Valley Authority, who helped establish the Khuzistan Development Services (Wilber 1981, p292). This is touched upon again in Chapter Three and Four. Further discussions on interpretation of planning under different conditions is best illustrated by a brief presentation of a number of case studies. The following sections will focus on planning strategies in Nigeria, Algeria, Cuba and China.

2:4.2.1 Nigeria

Nigeria gained independence from British rule on 1st October 1960. The Biafran civil war broke out in 1967 and lasted for three years until 1970. In 1987 Nigeria, with a population of 92 million, consisted of 19 states and a Federal State i.e. Federal Capital Territory. The federal states are autonomous except for foreign policy and defence, which are the central government's responsibility (Olamola, 1987).

The system of govenment in Nigeria places a signicant role on regional development and planning. Traditionally regionalism has always been characteristic of life in Nigeria. In 1914 two groups of provinces were formed, Northern and Southern provinces. In 1946 the country was divided into three regions; Northern Region, Western Region and Eastern Region. In 1963, the country was divided into four regions, and in 1967 into twelve states and, as previously mentioned, into 19 states at a later stage (Jibir 1985, p17).

However, when considering regional policy in Nigeria, in Mabogunje's opinion "it is different to that of regional development" (Mabogunje 1978, pp1-93). In his view:

> "regionalism trend has resulted in a type of regional chauvinism". (Mabogunje 1978, p46)

Regional policy, according to Friedmann, "deals with the locational aspects, and Where" of economic development (Friedmann 1965 p5). Its significance in many countries arises from a growing awareness of geographical or spatial inequalities and the importance of a locational or regional approach to the implementation of national growth objectives. In the Nigerian case regional development is vital for national unity and the most useful contribution to the development of different areas of that country (Mabogunje 1978, pp62-63).

The First National Development Plan (1962-68) hardly showed any awareness of regional planning problems in the country. The only exception was concerning the Niger Delta, and this was due to political considerations by the Federal Government. Of the regional governments only the Northern Nigerian Government, for instance, concentrated on irrigation schemes for rice and wheat cultivation in various river basins, such as the Sokoto to Rima Valley and Yobe River schemes, and on water

bore-hole drilling activities in specific areas.

The Second National Development Plan (1970-74) showed clear recognition of regional development problems. It emphasised that:

> "an important element of social justice for national integration is the worthy objective of balanced development as between different geographical areas of the country". (Second National Development Plan 1970-74)

Whilst there has been a genuine intention to have regional development, the only reason for its partial failure has been the nature of the planning organization in Nigeria. Actual planning activity in the country since independence, has been essentially the task of single ministries both at Federal and Regional levels. In the former, the relevant ministry is the Ministry of Economic Development; in the latter, the Ministry of Economic Planning (Olomola, 1987).

For a country the size of Nigeria, economic development is progressively bound to lead to an increasing concentration of productive capacities and to accentuate further existing regional disparities. This happens not only as between the States of the Federation but also as between the capital and the other parts of the states. For reasons of national unity, therefore, particular emphasis must be put on regional planning as a conscious attempt to minimize these disparities. In recent years there has been a growing consensus among planners that the growth pole concept could provide a strategy for achieving this objective. This is because essentially the growth pole concept seeks, through unbalanced concentration of productive resources, to bring about more balanced development.

As part of the successive governments' policies to ease the pressures on Lagos, and also help defuse a long lasting obstacle to national cohesion between the Southern and the Northern regions of Nigeria, in 1975 it was decided that the capital should be moved from Lagos to Abuja. On 5th February 1976, the Federal Capital Territory (FCT), an area of 8000 sq kilometres, was carved out of Kwara, Niger and Plateau States. Just north of the new FCT lay the existing town of Abuja. The military council abrogated the name of Abuja to the new capital city of Nigeria. Old Abuja became Suleja (AJ 1985 pp69-75).

The Federal Capital Development Authority (FCDA) was formed to oversee and direct planning and development. A sophisticated and imaginative plan was drawn up by a consortium of US planners under the name of International Planning Associates. The population target was set at 1.6 million with a first stage of 50,000. In 1985 about 25,000 people lived in Abuja, and by that time most of the work had been halted because of diminishing oil revenues, which were behind the creation of a new capital in the first place. Officially the cost of Abuja between 1979-83 was put at 1.3 billion Naira, but it is said that the true cost was in excess of 3 billion Nira.

The failure of Abuja clearly illustrates this over-optimism on the part of the authorities. The scale of the project and the lack of understanding of the socio-cultural identities of Nigerians by the foreign experts and reliance on imported construction technology and expertise were the principal causes of the failure. An expatriate architect working in Abuja pointed out:

> "In Abuja there has been a clash of responsibilities. The traditional responsibility to extended families and tribal /zonal loyalties came into conflict with the requirements of rigorous fiduciary administration". (AJ 1985 p71)

It is also necessary to point out the role and responsibility of outside consultants in Abuja. A British new town authority provided plans and house types for use in Abuja, and undertook detailed road and house layouts. The same architect adds:

> "It is of no surprise to see in the middle of African landscape, built British new town row housing and four and five storey tenement blocks. It looks as if a job lot has been taken out of the plan chest and sold to FCDA, as it does not seem that any attempt has been made to suit the housing to African needs and Nigerian climate. (AJ 1985, p72)

From its inception to the present day, Abuja has been marred by corruption, amongst the Nigerians and outside firms, and the result has been an incomplete crumbling large city with so many of the buildings already fit to be bulldozed. Abuja, the new Federal Capital of Nigeria, provides a sobering lesson in the problems and pitfalls of attempting to apply planning

principles and building types derived from western culture and climate within an emerging Third World Nation. However, the underlying concept of Abuja is strong. The reasons for the new capital remain valid, the structure plan sound and not all investment lost (A.J, 1985).

The failure of Abuja is an example of how planning mistakes can occur and how events can overtake the decision makers and planners. Whilst with cash in hand it is possible to purchase expertise in the short term, the case of Nigeria has clearly shown that development in the long term cannot be bought. The Abuja example in particular poses questions on the wisdom of the choice of planning and construction principles prescribed by expatriates. It might seem that had some of the investment been directed at the indigenous construction industry in Nigeria, and had there been more emphasis on the use of locally available techniques of construction and materials, there could have been a different outcome at Abuja. In the next section efforts at decentralisation in Algeria, another oil producing country, is presented.

2:4.2.2 ALGERIA

Algeria gained independence in July 1962 after 132 years of French domination and after a bitter struggle for national independence. During the seven years of the Algerian War of Independence from 1954 to 1961, nearly two million Algerians, soldiers and civilians, died (Sutton 1977, p336-337).

When the Algerian Revolution broke out in the Aures mountains the French army embarked upon the policy of what became known as the anti-guerilla strategy of REGROUPEMENT. This took the form of moving the entire inhabitants of forbidden zones to regroupment centres and destroying their settlements. Between 1954 and 1962, 8000 villages and hamlets had been burnt or wrecked, displacing an estimated 3,525,000 of Algeria's rural population. Regroupement led to the breakdown of traditional rural society through imposing socio-psychological pressure on the Algerian peasant. The subsequent land abandonment and discovery of wages encouraged urbanization on a grand scale. On the subject of urbanisation in Algeria Brebner established that:

> "After 1962, the anticipated movement out of the centres back to farms and hamlets did not take place, only 250,000, under ten per cent of the regrouped population, moved back". (Brebner 1981, pp43-56)

The 'Regroupement' policy had a permanent impact on the Algerian settlement system, particularly in the rural areas. After 1962, Algeria, in order to transform a nominal independence into a real one, adapted a decolonisation process along revolutionary socialist principles. This involved nationalisation, mass democratic participation in cooperative enterprize and, at the national level, integral planning. According to Nellis:

> "The transitional and developmental ideology has been a major determinant in the post-independence evolution of the settlement system". (Nellis 1977, p533)

This produced two results; first a change to the settlement function through the loss of COMMENDENT FONCIER, 'the management and rent collection by the French', the access to industrial and service functions facilitating the development of towns as growth poles; and secondly, the spatial reorganisation of the settlement hierarchy through administrative reform and rural settlement policy. A series of administration decisions have affected the organisation of the Algerian settlement system. In their comprehensive examination of the process of regional development in Algeria, Nacer and Sutton (1987, p132) indicate that serious attempts at regional planning took place in the late 1960s and early 1970s. These were:

> "In the form of Special Programmes each for a specific lagging region, and through the Economic Regions postulated in the Second Plan, 1974-7. The latter approach suggested six Economic Zones cutting across established administrative divisions, each zone having certain planning objectives aimed to lessen the growing concentration of population and activity in the coastal poles. However, these imaginative proposals were not fully accepted by the main powerful ministers and so did not subsequently become operative". (Nacer & Sutton 1987, p132-133)

After independence the introduction of the "Code de Wilaya" in 1969 granted more political autonomy, more financial power and

more independent responsibility for socio-economic and cultural provision. In 1974 the associated establishment of 31 regional and 158 district administrative centres led to a substantial reorganisation of the settlement pattern in Algeria. With regard to rural regions since independence, there had been a noticeable absence of a comprehensive rural settlement policy for the decade up to 1971. In November 1971 the charter of the Agrarian Revolution was published and this proposed the radical restructuring of the rural settlement system. The spatial reorganisation of the general settlement pattern was initiated by the 1000 socialist villages programme in July 1972. The overall aim of the programme was:

> "to concentrate the dispersed rural population in nucleated settlements near the cities. It was envisaged that this would provide 'complementary centres' in poorly serviced areas like Eastern Algeria. Further, in order to discourage urbanisation, the programme would counteract the employment and residential attraction of the city. It was hoped that with the establishment of cooperatives agricultural workers would stabilise in highly productive rural areas. In this way the transformation of the settlement structure would be achieved through land improvement such as irrigation and enlargement of the base of the settlement system, by providing the first complete rural centres in a sparsely populated steppe area, and settling the semi-nomadic population." (Brebner 1973, p48)

The villages were classified into three groups, PRIMARY (population between 700-1450), SECONDARY (1750-2450) and TERTIARY (2800-4900), each with varying degrees of service provision. The socialist villages programme was launched with a first phase of 100 new villages included in the 1970-1973 National Development Plan and a further 300 in the second plan, 1974-1977. The first seventeen of these villages were designed as pilot schemes. The programme fell behind its target from the outset. The first 20 villages, which were targeted for completion in 1974, were eventually finished in early 1975. The number of villages planned reached 370 by 1979, and the number of villages constructed reached only 85 by March 1977, 90 by December 1978 and 120 by July 1979, with 70 more under construction.

In terms of their distribution, Western Algeria accounted for

about 40 per cent of the planned villages and 43 per cent of those completed by December 1978. Central and Eastern Algeria each have about 25 per cent of the completed villages and the rest are in the Sahara. The villages tend to be situated in the plains where agricultural productivity is higher, with few constructed in zones of poor agriculture, especially the mountains where little land was acquired by the agrarian reform.

2:4.2.2.1 The Implications of the Socialist Villages Programme

The socialist villages programme was stopped in the early 1980s by the new President of Algeria, who replaced the more radical President Boumedienne. The wider implications of the new programmes can be evaluated with respect to the agrarian reform programme, the rural settlement system, and rural society and its culture in general. The agrarian revolution, launched in 1971, faced problems arising from the predominantly dispersed rural settlement pattern which often resulted in excessive distances between the place of residence and the new place of work of the land reform recipient, now a member of one form or another of production co-operative.

As improved rural service centres the new villages can contribute to a reduction in the rural-urban population movement. Access to an improved range of services may reduce the need to move to urban centres, though they help raise the aspiration levels and this may later promote rural exodus. Consequently some socialist villages threaten to take on a different role in the rural settlement system as commuter villages. With regard to the implication of the Socialist Villages, Hadjou (1982) states:

> "Assuming that the 1000 villages could have been completed, this would have accounted for 15 per cent of the then rural population. The construction of 1000 villages is beyond the ability of government to finance the programme unless alternative design methods are sought to use less expensive building materials and the self-help concept (Hadjou 1982, pp80-90).

As mentioned in the previous section the socialist villages programme met delays with regard to the planned target of completion; this was due to various reasons. These included

shortages of construction materials, of skilled builders and planners. As is the case with many countries in the developing world, cement, in particular, was in short supply, and the situation is more acute at present. Construction usually took 18-30 months or longer. Also, Algerian planning institutions were young and indecisive. With regard to localised policy, the success of the programme depended on the dynamism of the local authorities to launch and sustain building operations.

The most important reason for delays in the programme has been the staggering costs involved (Sutton 1982). The construction cost of each dwelling rose from 20,000 dinars in 1973 to 50,000 dinars by 1976 and since then to 70,000 dinars by 1979. These do not include the additional cost of the provision of the collective buildings and infra-structure. The total cost of a complete primary village was estimated at 5.5 million dinars for 1975, and for an average sized village, at 15-20 million dinars for 1979.

In his study of the Algerian Socialist Villages, Sutton (1982) observes:

> "However, there is no doubt of the high standard of the dwellings and the social services offered. Despite some variations in the layout, house-type and function, the socialist villages form a separate group of settlements distinguished by their modern, if uniform dwellings built to a high standard and serviced to practically urban levels". (Sutton 1982, p356-75).

The examination of the different planning strategies adopted by Nigeria and Algeria, two countries which have enjoyed substantial foreign exchange in the form of oil income, has demonstrated further the partial failure of ambitious planning goals. The following section will briefly outline the experience of planning and development in Cuba since 1957.

2:4.2.3 Cuba

The national economic policies of early years in Cuba after the revolution aimed at the simultaneous reform of agriculture and industry, and at some diversification within each. The prevailing orthodoxies in the West and the USSR at that time suggested that economic growth could only be built on a heavy

industrial infrastructure of the most advanced kind. That was not easy to establish under the international blockade, with the US government applying all fair and foul means to disrupt the Cuban economy to push the country back into the capitalist fold (Stretton 1978, p130).

Cuba's socialist goals were to achieve spatial eqality in production, consumption and political participation,and create a "landscape of socialist integration" (Forbes & Thrift 1987, p25). The government meanwhile developed central planning institutions, an office for National Economic Planning, one for "agrarian planning" and reconstruction, one for construction with various subdivisions, including one for physical planning (Architectura/Cuba 1987). The economic and urban planning machinery was centralized. For more than a decade after the revolution the desperate search for effective economic policies had tended to lurch from one radical experiment to another. The 1970s saw the emergence of economic pragmatism, including some unique innovations like the housing micro brigades, but mostly meaning closer interpretation and style of some particular Soviet or Western models. They seem to have included the new industrial cities of the USSR, the design philosophy of Le-Corbusier, filtered through various French disciples, and some western principles of road and transport planning that the west was already beginning to regret. As Stretton (1978) notes:

> "Despite its economic difficulties and changing policies, Cuban society is run on fairer principles, with better housing and services and general social conditions for most of its country people, and less abuse and exploitation for many of its city people, than were ever likely under its capitalist masters". (Stretton 1978, p126)

In 1953, before the revolution 97% of rural housing and 55% of urban housing was classified as insanitary or inadequate (Stretton 1978, p127). But in the 1980s Cuba has one of the best health and education services in the developing world, rivalling European services (National Geographic 1989). In 1972, 85% of households owned or were buying their houses in Havana alone (Stretton 1978, p131). The Cuban policy of decentralisation and development of rural areas is in effect a policy of 'positive urbanisation'. This has taken place in the form of bringing the people together in clustered settlements offering better services (Susman 1987, p278). Susman's

study of spatial equality and transformation in Cuba suggests that:

> "Socialist spatial integration in Cuba is the goal of steadily increasing urbanisation. This has and will continue to have the effect of eliminating population dispersal and pockets of low participation in the national political and economic life. (Susman 1987, p279).

In 1975 a series of changes in spatial reorganisation led to more homogenous and economically realistic provincial and municipal structures. Susman adds:

> ".....the more even distribution across Cuba of the provincial capitals, compared to the old capitals, facilitates more even investment patterns and growth over the country. Linking larger cities to each other further contributes to possibilities for achieving equality in infrastructure and economic activity". (Susman 1987, pp280-281)

The experience of spatial planning policies to achieve spatial equality has shown a tendency of a steady increase in urbanisation based on socialism as a system of equality. The examination of the Chinese experience in the following section will reveal a tendency towards rural development as the major policy to minimise urbanisation.

2:4.2.4 CHINA

The Chinese Communist Party was the first to achieve power by peasant revolution. Compared with Cuba, the Chinese cities are more diverse, the revolutionary ideas about them have been more complicated, and it is not hard to argue that the performance has been more realistic and constructive. Mengione (1987) and Basso (1980) divide the Chinese post-revolutionary experience into three periods: immediate post-revolutionary reconstruction(1949 to mid-1950s); the phase of international isolation and industrial development (mid 1950s to mid 1970s); and the phase of industrial development and the 'open door' policy (mid 1970s to mid 1980s). Before 1949 the rural areas in China were devastated by poverty due to the extraction of the economic surplus from the countryside by the wealthier

classes. After 1949 rural areas came to life with water control projects, small industries, transportation and communication networks (Stretton, 1978).

When it came to power the party knew that it lacked experience with industries and cities. So it did its best to keep them going without breakdown while looking for Soviet advice and aid with their socialist transformation. That produced the First Five Year Plan from 1952. It laid some heavy industrial foundations and tended to increase rather than reduce (Maxwell 1979) "the three differences" ie; between industry and agriculture, between mental and manual work, and between city and country life. Heavy industrial development has continued ever since, but from about 1955 there has been a steady increase of light industries, often in smaller cities and towns in rural communes. This was achieved as follows:

> "During the first period, the initial policy was devoted to using an increasing quantity of resources to create industrial activities in the existing cities and to expand those already located there. The emphasis was on labour-intensive processes in order to absorb as much of the workforce as possible into productive activities. At the same time there was an effort to rehabilitate housing, urban infrastructure and facilities, but with saving as much as possible hidden and semi-hidden resources and the voluntary activities of the population itself". (Mingione 1987, p45)

Socialist organisations had found a way to make small business small again and responsive to local needs. It had also managed to build a great deal, for such a poor country. Forty years after the revolution everybody could work and get enough to eat (Stretton 1978). They could read and write, and see their children educated and assured of similar securities and widening choices of work. A more detailed analysis of the nature of the planning system and the construction industry in China will be presented in Chapter Seven.

The level of Chinese development since 1949 has fascinated many observers, both in the developed and less developed countries. Although these researchers and development specialists differ on aspects of Chinese development, they agree on one feature, i.e, the choice of technology for national development. The final section of this chapter, therefore, focuses

on the concept of appropriate technology and its relevance to overall development.

2:5 The Impact of Technology on Development in Developing Countries

In the previous sections of this chapter, discussions centred on such issues as development, planning, the construction industry and its role in national development. Further, in examining the strategies for development in developing countries it was established that in most cases these were based on the experience of other countries and differing ideologies and principles. As a result of such development strategies, various studies have shown that industrialisation and import substitution has been the dominant factor for economic development. Undoubtedly most of the industrialisation has been based on imported technologies which have resulted in the long-term dependency of many developing countries on the more industrialised countries. As Merrill (1968) notes:

> "The Third World gets almost all its technology from the advanced countries: it is technologically dependent on the advanced countries where most of the search for new technology takes place". (Merrill 1968, cited in Stewart 1978)

On the inconsistency of technology and its impact on development in developing countries, Stewart (1978) writes:

> "It is apparent there that the technology adopted is distorting the pattern of development, favouring a particular lop-sided pattern of growth, creating employment problems and skewed income distribution, and failing to make use of poor countries' natural and human resources". (Stewart, 1978, p2)

In this section the concept of "Appropriate Technology" as a possible strategy for development is examined. In order to achieve this it is pertinent to provide a broad definition of inappropriate and appropriate technology. On the inappropriate nature of technology Stewart adds:

> "Techniques developed in advanced countries have charac-

> teristics largely conditioned by the economic environment in the advanced countries. The inappropriate nature of these techniques for underdeveloped countries arises from differences in the economic and institutional environment between advanced and Third World countries. As a result of these differences, these techniques have inappropriate characteristics for underdeveloped countries: when they are transferred to Third World countries, their econometrics are distorted in the effort to reproduce the sort of conditions for which the techniques were created." (Stewart 1978, p60)

In section 2:3 it was mentioned that a major factor influencing the development efforts in developing countries is the impact of western technology in the construction industry. This has spread rapidly, particularly in the last thirty years, through large scale industries, multinational corporations, joint ventures, technical assistance projects and other carriers (Rafii, 1987). On the subject of the irrelevant pattern of education and training in developing countries, in his impression of the Habitat Conference in Vancouver, Turin stated that:

> "...the Third World has inherited a system of education which was already obsolete by the time it was exported and which is preposterous- which is scandalous- for the Third World. Can you imagine that professionals of these countries are trained according to the standards of the Royal Institute of British Architects... in Nigeria? Can you imagine that masons in Zambia have to meet the requirements of the building codes in London? - which are only sixty years out of date in London, let alone in Zambia. Can you imagine that school holidays in Chad are geared to the French seasons? This is still happening, now, after independence. It's unbelievable, this scale of non-change, of permanence, of inertia, of stupidity..... (Turin, 1976)

Before embarking on more detailed discussions of the concept of appropriate technology the following section will provide the definition of A.T.

2:5.1 The Definition and Origins of Appropriate Technology

The exact definition of the term "appropriate technology" is the subject of lively if inconclusive theoretical debate. In the context of this work "appropriate technology" can be defined as:

> The technology which works in the area that it is applied, is suitable to the surrounding environment, and the way it uses local resources. The idea here is that the value of a new technology lies not only in its economic viability and its technical soundness, but in its adaptation to the local social and cultural environment.

Morawetz (1974) defined appropriate technology as:

> "Appropriate Technology may be defined as the set of techniques which make optimum use of available resources in a given environment. For each process or project, it is the technology which maximises social welfare if factor prices are shadow priced". (Morawetz 1974, cited in Stewart 1978, p95)

Stewart disagrees with this definition for two reasons. Firstly because it discredits the concept of a single set of shadow prices and a single optimum. Secondly, because of its assumption of a set of techniques. Stewart believes:

> "There are two issues here: one is the question of choice within existing techniques, or what we might describe as the 'appropriate choice'; the other is the question of the development of more appropriate techniques". (Stewart 1978, p95)

The most pertinent definition of appropriate technology has been given by McNamara et al (1984). The word "technology" is derived from the Latin words of "techne" meaning skillful, practical, and "logia" being logic, meaning the science of correct reasoning. Thus it can be deduced that "technology" is the 'science of the application of knowledge to practical purposes'. The word "appropriate" is derived from the Latin origin of "ad" and "propious". The two words respectively mean 'towards' and 'socially suitable'. With the earlier definition of the word technology the phrase "Appropriate Technology" can thus be described as:

> "the Science of the Process of the application of knowledge to a practical purpose to promote fitting, proper, suitable responses and actions to any given environment". (McNamara et al 1984, p20)

It therefore becomes essential to point out that when reference is made to "appropriate technology" it does not mean primitive or elementary technology. Assessing the appropriateness of a technology necessarily implies some sort of value judgement, both on the part of those who develop it and those who will be using it, and when ideological considerations come into play, as they often do, appropriateness is at best a fluctuating concept. Indeed, due to the failure of what has now become the conventional concept of appropriate technology, there has been a need to change the emphasis of A.T. This debate was launched by the appearance of an article entitled "New Perspectives on Appropriate Technology" when Clark, (1988) of the Policy Research Unit of ITDG (Intermediate Technology Development Group), argued that in some cases "application of new technologies can often foster new skills and upgrade existing skills".

Following the recognition at the start of the 1970s that development projects linked to the transfer of capital intensive technology were not the answer, appropriate, intermediate and alternative technologies were seen in the early days as a means to transform society by making parts of it autonomous and "liberated". In reality, the AT approach was in most cases a failure: it did not really take into account the needs of populations and their social processes. Instead, scarcely affecting the civil community, the AT movement produced a variety of objects, building materials and technologies, (such as block making presses, latrines, wind mills, solar cookers, soil-cement, lime-pozzolana cements, vaults and domes), which in general were not taken up by the societies at which they were aimed. There was a lack of diffusion or reproduction, and they were rarely effectively marketed. This in effect has reduced the image of AT to that of a catalogue of "unusable" products (Habitat Forum Berlin '87).

Moreover, Appropriate Technology as seen under titles such as "building with your local materials" can be interpreted as an opportunity for the industrialised world to re-assert its domination and open up new markets. Small manufacturers of equipment for operating small scale production units have

appeared, and the large established manufacturers are proposing the "miniaturisation" of their equipment for sale in the Third World (Habitat Forum Berlin '87).

Overall, however, even though the AT movement has not achieved its original objectives, in some professional circles it has promoted a better awareness and analysis of low cost housing, and, in particular, of the activities and approaches of the informal sector. This in turn helps to define the direction and the strategies for the future. It is important, however, that appropriate technology should first and foremost be an indigenous creation of the developing countries themselves, and the central problem they have to face is that of building up an indigenous innovative capability, not that of importing more foreign technology.

The immediate origins of the appropriate technology movement, as mentioned earlier in this section, is the realisation, shared by aid-giving and aid-receiving countries alike, that development aid and a western style of industrialisation have neither fulfilled the initial hopes which were placed in them nor been fully capable of solving the basic problems of development. Dr E.F Schumacher has been one of the people who has most vividly explained this problem in his book, Small is Beautiful, which perhaps more than any other has contributed to popularise the concept of intermediate technology.

2:5.2 Appropriate Technology as a Concept

Low-cost, intermediate, self-help, progressive, and correct technology, are only some of the different terminologies used to label what is put forward in this thesis as the concept of "appropriate technology". However, much has already been said about these concepts and the kind of principles which are generally understood to underly them by professionals and scholars, including Fathy (1974,1976), Miles (1977,1984,1985), Bhalla, Parry, Stulz, Detheir, Spence, Agarwal, Cook, Cain and Koenigsberger and the late Professor Turin. Many international agencies including the World Bank, the Intermediate Technology Development Group, the International Labour Organisation and UN Habitat have also been promoting the use and development of appropriate construction technology.

The movement to keep these principles alive in various parts

of the world and in countries at different levels of development has been spreading rapidly, if still in a fragmentary way. This is the way Miko Usui, the head of the Technology and Industrialisation Programme at OECD Development Centre, wrote in 1974:

> "The idea of appropriate technology began to surface when a growing number of development experts and national policy makers started questioning the wisdom of massive technology transfers from the industrialised countries to the developing nations. The large scale capital-intensive technologies developed in Europe, North America and Japan and some East European countries, whilst being efficient in their country of origin, often raise more problems than they solve when they are introduced in poorer, less developed societies. They are usually very costly relative to the income of the local populations, they require an educational and industrial infrastructure which takes decades to build up and their disruptive social consequences tend to be much more sudden than in their culture of origin (Miko Usui in Jequier 1976, 16).

But perhaps most important of all, their introduction often inhibits the growth of the indigenous innovative capabilities which are necessary if "development" is to take place. Whilst the symbols of modernity, such as steel mills, automobile factories or squadrons of military aircraft, can be purchased on the international market, development is a complex social process which rests in large part upon the internal innovative capabilities of a society. Imports of foreign ideas, values and technologies have a major part to play, but few societies in history have developed exclusively on the basis of such imports.

One of the major tasks facing the developing countries is to create, nurture, and more often than not, rehabilitate their internal capacity to invent and innovate. As far as technology is concerned, this implies not only a much greater selectivity in the choice of imported equipment, plants and methods of production, but also, much more importantly, the invention and diffusion of new types of technology and new forms of organisation which are better suited to local conditions.

2:5.3 The Relevance of The A.T Concept to Development

Appropriate technology may well be the only solution to the development, or more modestly the survival, of the rural communities. But its development and diffusion raise a number of political and social problems. One of these is the allocation of resources: even though appropriate technology is comparatively inexpensive, if one measures its cost in terms of investment per workplace, its large scale diffusion requires important sums of money, which might otherwise be used for large projects based on modern technology. The latter have much greater visibility, they are somewhat easier to manage since they deal mainly with hardware, they benefit from the social prestige of modernity and are usually the winners in the political competition for scarce resources.

Since investment decisions in the developing countries are taken for the most part centrally, e.g by the planning ministry and not by private entrepreneurs, the development and growth of industries based on appropriate technology depends very much upon political options taken at the highest level. This is perhaps true in the case of China, one of the pioneering countries in the field of appropriate technology, and one cannot help being struck by the fact that the development and diffusion of such technologies is not only an economic or technical problem, but also an ideological and political issue. A more detailed discussion on the validity of the concept of A.T and its relevance to the hypotheses of this thesis and ways of promoting it by adopting policies will be presented in Chapters Six and Seven.

2:6 Conclusion

As the result of the various definitions the objective of development is to meet basic human needs, i.e, in education, shelter, better social services, a reduction of inequality in income distribution, and to ensure the participation of people in the decision making process. A critical though brief review of development planning in different countries suggests that in most cases economic development planning and physical planning as two streams of development planning have been carried out separately. It was also shown that due to the lack of attention to social, political and physical environmental considerations, rapid economic growth in a number of developing countries has resulted in an unequal distribution of wealth amongst the different sections of the society.

Thus the changed approaches to conventional planning resulted in the concept of integrated development planning, when all aspects of development are taken into consideration, i.e. the close relationship between economic and social factors and interdependence between the various sectors of development. In the examination of the process of planning and development in developing countries it was argued that these were based on planning policies and ideologies that originated in developed countries.

Although the 1980s has seen the increasing role of free market economic principles (especially in the U.S.A and Western Europe), because of the failure of such policies in many developing countries the more centralised and market control planning practices prevail. Development planning based on the capitalist or non capitalist way of development was seen in the the review of development planning practices in Nigeria, Algeria, Cuba and China. Amongst the most notable planning strategies that have been in action in many countries regional planning and growth pole, or spatial planning strategies, are the most widely used.

This review has shown that there could be no doubt about the importance of regional planning and development, as this is the only way in which development could be spread amongst the regions of a country, both in urban and rural areas. The development of Abuja as the New Federal Capital of Nigeria and its failure once again highlights the consequences of applying the planning principles of western culture within emerging

Third World nations and the strategic importance of self reliance. On the other hand, evidence sugests that regional development based on growth centres and growth pole theory could help to bring about development in a more even distribution, and be one way of spreading development.

By emphasizing the role of the construction industry in national development this chapter advocates the concept of planning construction interaction. This is validated by the examination of the construction industry and its role to the development process by its contribution to:

The National Economy;
The National Income;
Capital Formation; and
Employment Generation.

The empirical evidence from a number of countries supports the important contribution that construction can make to national development, especially in those countries which are at the early stages of development. In this context the failure of many countries to meet their development targets is blamed on the inability of the construction industry to perform the tasks for the implementation of development projects in these countries. This in turn necessitates the engagement of foreign expertise, who deploy modern construction technology and, as a result, use expensive locally unavailable materials and building components.

Technological dependence is perceived to be due to both the choice and the lack of development of appropriate technologies which are prerequisite to development. The planning policies and development strategies have a direct impact on the exploitation of resources and mobilisation of manpower in these countries. Thus the interaction between planning and construction on the one hand and the process of technology adoptation in development planning form an inseparable conditional set of strategies for national development.

The evidence from the developed countries indicates that regional planning has shaped the present state of many countries, particularly England, France and the U.S.A. It may therefore be assumed that regional planning provides a link between the national planning framework and local aspirations. At one end of the scale it may seek to integrate a major

segment of a country within a national economic framework while, at the other, it may involve land use planning and the provision of services, for a specific development area.

The experience of comprehensive development in Volta River Valley in Ghana shows that it is far more easy to change the physical environment than to change the socio-economic conditions in a region. In Kalitsi's view:

> "Given the financial resources there is enough organisational and technical experience to draw upon in the world to carry out physical conditions, especially in the rural areas of a poor society. Experience outside the environment is hardly applicable. The factors involved are complex and variable. The most rational of plans can, at best, only influence a few of the factors and even then, only if the plans are given a long enough time to be proved (Kalitsi 1971, pp71-74).

Further, the Algerian experience illustrates that the partial failure of the Socialist Villages Programme was because of an inefficient implementing organisation on the one hand and a too authocratic implementation approach on the other. Therefore the adoption of a more flexible approach that allows some public participation in the planning and implementation of resettlement programmes is necessary.

The 1980s have witnessed the near collapse of the economies of a large number of oil-producing countries. Amongst these are Nigeria, Mexico and Algeria, for whom the economic prosperity based on oil came to a sudden halt with a huge debt mountain present over the horizon. The concept of Pl.C.I is further supported by the cases of Nigeria and Algeria where ambitious development plans failed to recognise the potential and limit of national resources. In the Nigerian example inappropriate planning principles and methods of construction, with the use of imported materials further complicated with the shortage of funds (foreign exchange), caused the failure of the development at Abuja. The same factors also contributed to the failure of the Socailist Villages Programme in Algeria. In this case the very expensive urban-dominated construction standards applied to rural settings and the inadequacy of implementing agencies were partiallly to blame.

The discussions on the construction sector and its importance

both in the economy and the development process highlight the necessity of having a viable indigenous construction industry in the countries of the developing world. As Wells (1984) argues:

> "the problems facing the construction sector in developing countries are embodied in the lack of development of local industry, and of local resource base, they may theefore be perceived as problems associated with the general condition of underdevelopment". (Wells 1984, cited in Shanti Jayewardene, 1988)

It is not the poor countries in the Third World that are having difficulties in meeting the development task. Even in those countries which have the financial resources at their disposal experience has shown that although foreign expertise can be purchased in the short term, development cannot be bought in the long term. As the literature on the construction industry shows, one of the reasons that developed countries maintained their rate of growth was dependent on their construction industry. Whilst it is difficult for the developing nations to attain viable means for implementing their development programmes, the experience of countries such as China has shown that efficient planning procedure regarding the use of resources and adoption of technologies which are not dependent on imported expertise can play a vital role in not only economic independence but also political independence.

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CHAPTER 3

3:1 Introduction

This section of the work is designed to promote an understanding of the nature of development planning in Iran from the 1940s to the present time. Chapter three sets out to examine:

The role and impact of government actions on the planning process, and

The political and institutional factors that affect the planning and construction process.

The process of Economic Planning before and since 1979 is examined first. The examination of the situation prior to 1979 is essential in order to analyse the differences and similarities of development policies based on opposing ideologies. The chapter will also provide a detailed insight into the organisations involved in both the economic and physical planning processes.

The second part of the chapter briefly outlines the history of urbanisation in Iran before reviewing physical planning procedures. This includes an up-to-date analysis of administrative, legal and policy aspects of urban planning. The examination of the urban planning process will be complemented by an analysis of the construction process in Chapter Four.

3:2 Pre-1979 Development Planning

The period after World War I and the accession of Reza Shah to the throne in the mid 1920s could be considered as the era when the first steps towards modernisation of Iran were taken. Impressed with Kemal Attaturk's efforts in developing the Turkish Republic, Reza Shah's strategy of economic development was modelled on Attaturk's "etatist" model (Razavi & Vakil 1984, p19). The "etatist" model and Reza Shah's thinking both professed "modernisation from above", and was seen as the only way to make Iran a strong, self-respecting nation that could hold its own in the modern world (Keddie 1981). Thus an impressive programme of modernisation began which comprised rapid industrialisation and development of the country's infrastructure, while neglecting the agriculture sector (Mofid 1987, p7).

According to Mofid (1987), these policies were;

> "in many ways a dress rehearsal of what was going to be his son's programme of modernisation and development".

In the immediate post-war years the idea of reconstructing the Iranian economy through government initiative gained momentum once again. Through the help of several foriegn countries and consultants and three years of preparatory work, the implementation of the First Development Plan began in 1949. The invasion of Iran in September 1941 by the Allied Forces had major economic consequences for Iran (Mofid 1987, p34). Once Iran emerged from the Second World War, parts of the country were occupied by the allied forces, British in the South and the Soviet Union in the North. The economy was in a state of disarray with a high rate of inflation and broken down infrastructure and industry (Baldwin 1967, Amouzegar & Fekrat 1971). In order to face the situation, the government responded with the allocation of oil revenue and loans obtained from overseas governments to create infrastructure, to revitalize the government industries, to encourage private industrialists, to expand agriculture, and to provide a measure of social services (Farzanehpour 1976). In the period of 1949 and 1979, six national development plans were prepared. The implementation of each plan was, however, influenced by a series of both internal and external political factors (Table 3.1).

The First Development Plan (1949-1955) was abandoned as the result of a dispute over the nationalisation of the oil industry. This occured in the form of economic and political strangulation of the nationalist government of Dr Mosaddeq against whom an Anglo-American engineered coup was staged in 1954 (Afshar 1985). Appendix 4 provides detailedaccount of each development plan.

3:2.1 Second Development Plan 1955-62

A more stable political environment and the availability of funds permitted the launch of the Second Seven Year Development Plan (1955-62). The Second Plan was drafted on the basis of the October 21, 1954, agreement between Iran and the international oil companies, for it was already recognised by the Iranian planners that oil revenues would fuel the plan (Razavi et al 1984, p22). In fact emphasis on oil-export which was the

Table 3.1. The evolution of the development planning system and its impact on the Iranian Construction Industry in the 20th Century.

1906-1907	The Constitutional Revolution and the establishment of the Majles (Parliament)	
1908	Discovery of oil and the founding of the Anglo-Persian Oil Company	
1913	The first Municipality Act	
1914-1926	First World War, toppling of Qagar Dynasty and the establishment of the Pahlavi Dynasty	
1933	The Street Widening Act	
1926-1941	Signing of a new oil treaty with england and the renaming of APOC to Anglo Iranian Oil Company (AIOC). The start of modernisation programme.	
1941	Invasion of Iran by the Allied Forces despite Iran's declared neutrality in World War II. Replacement of Reza Shah by his son.	
1948	The founding of the National Front by Dr Mossadeq	
1949	The setting up of Plan Organisation	
1949	The launch of the First Seven Year Plan (1949-55)	
1951	Nationalisation of the Iranian Oil industry	
1953	The deposing of Dr Mossadeq's Democratic Government by the Anglo-American inspired coup	
1956	The launch of the Second Seven Year Plan (1956-62)	
1960-62	The Economic Stabilisation Programme. U.S Marshal Plan, Point Four Programmes	
1962	The "white revolution". The Land Reform Bill.	
1962	The PO becomes Plan and Budget Organisation (PBO)	
1962	PO becomes Plan and Budget Organisation, (PBO).	
1963	The launch of the "White Revolution" by the Shah	
1963	The launch of the Third Development Plan (1963-67)	
1963	The June uprising against the "white revolution"	
	The return of the first generation of foreign trained architects and engineers.	
	The adoption of Master Plans	
1964	The feasibility study of the twenty-five year phased development plan.	
1968	The Kaldik (Dasht-e-Bayaz) and Firdows Earthquake, 10,000 dead.	
1968	The launch of the Fourth Plan (1968-1972)	
1968	Approval of the 25 year Physical Development Plan.	
1972	Tehran Asian Games	
1973	March 21. The launch of the Fifth Plan (1973-77)	
1973	December, Tehran oil Agreement by OPEC members	
1973-1974	The first oil price increase,	
1974	July 1974, special session of the High Economic Council at Gajareh (near Tehran) and the prepartion of the Revised Fifth Plan.	
1974	1-3 August, the formal presentation of the Revised Fifth Plan to the Shah at Ramsar and the adoption of the "big-push" policy. "great civilisation goal"	
1976	Abandonment of the Fifth Plan and preparation of the Sixth Plan	
1976-1977	The economic recession and anti-inflation campaign.	
1978	Tabas earthquake, 20,000 dead.	
1978	The Revolution begins.	
1979	January 13, the Shah leaves Iran.	
1979	February 1, Ayatollah Khomeini returns to Iran. February 11, victory of the Islamic Revolution, birth of the Islamic Republic, end of ancien regime	
1979	The second oil price increase	
1980	June, beginning of the "cultural revolution". Universities are closed down.	
1980	September, Iraq invades Iran	
1982	Introduction of a new system of planning	
1983	The launch of the First Five Year Development Plan of the Islamic Republic (1983/84-1978/1988)	
1984	PBO becomes Ministry of Plan and Budget (MPB)	
1985	Eruption of the "War of the Cities", attacks on major urban targets	
1986	Intensification of attacks on economic targets, communication networks, railways and oil installation	
1987-1988	"War of the Cities" final act, blanket attacks by S-S missiles, large scale urban destruction	
1988	July 18, Iran accepts ceasefire in the War	
1988	August, debates over the strategies in post-war reconstruction begin, promise of utopia.	
1989	February 11, the Tenth Anniversary of the Islamic Republic, preparation of the Second Development Plan.	
1930s	Public and Administrative Building Construction programme	
1930s	The Construction of Alborz (American) College and the introduction of wetern type brick (20*10*7.5cm)	
1933	The reshaping of the physical basis of Iranian Cities. Demolition of City Centres and construction of Wide City Avenues.	
1935	The construction of the Trans-Iranian Railway	
1941	The establishment of the School of Arts and Architecture at Tehran University	
1941	The construction of the first high rise building in Tehran. Public Building Programme.	
1954	Industrialisation; Infrastructure Development, Hydro-electric dam projects, including Karaj, Sefid Rud Dam and Dez (RDC), inspired by the T.V.A. Road network construction.	
1957-59	Economic boom, urban housing development	
1963	Building of educational and health care facilities	
	Construction of new urban settlements.	
	Large scale public building programme	
	The construction of the first High-rise Apartment towers.	
1968	The Construction of Aryamehr (Pouladshahr) Steel Mill with the help of the Soviet Union.	
1966-71	Land speculation and speculative construction boom	
1968-72	The construction of Olympic village, including a 100,000 seat stadium,	
1972	The construction of Arya-shahr Satellite Town next to the Steel Mill near Isfahan.	
1970s	The New Town construction including, Shushtar New Town, Bandar Shahpour New Town etc.	
	Promotion of Industrialised Building System	
1973	Start of the six year building boom	
1975	The Crash Housing Programme	
1978	The launch of major reconstruction programme.	
1979	The end of six year building boom	
1980	Immediate destruction of the largest port facilities, infra-structure etc	
1982	The launch of a new earthquake reconstruction programme.	
1983-84	Construction (housing) boom,	
1985	"War of Cities", intensification of attacks on urban areas, Act I.	
1985	Reconstruction of War damaged areas.	
1986	Re-start of the construction of Tehran Metro	
1987	Construction of Air-raid shelters and ad-hoc rebuilding work, intensification of construction of Tehran Metro	
1988	The completion of the construction of Torogh and Karoeh Dams and related facilities by Iranian experts without any foreign assistance.	
1988-1989	The slow road towards reconstruction, the first relaunch of a number of of projects including airports and railroutes near the war front. Completion of the first and second phase of reconstruction of Abadan Refinery	

Source: Compiled by the author Historical Dates from: Yarshater (1986), Razavi et al (1984), Milani (1988), Pesaran (1985), and Sakhteman Magazine (1988, 1989).

main source of foreign exchange became one of the peculiar aspects of Iran's development which, for good or evil, has played an important part in the process of development (Mofid 1987, p40), providing the foreign exchange for the import of foreign products and expertise (Bruton 1984). In Katouzian's view this was;

> "a situation representing 'Pennies from Heaven' or in other words 'this must indicate the road to paradise on earth' (Katouzian 1981, p206).

Between 1955-62, Iran's receipt of foreign exchange from oil and aid averaged at about 17% per annum. Certain key projects were completed which were seen to lay the ground work for the economic expansion that followed including the construction of large dams and hydro electric projects and emphasis on industry. However although the Second Plan achieved considerable results, it was not comprehensive or unified (Razavi et al 1984 and Mofid 1987).

A modern construction sector began to emerge in this period as local entrepreneurs developed contracting capabilities alongside the foreign firms had been attracted by the large capital projects. The production of cement and import of steel was limited to a few national centres and shortages were to dictate a powerful patronage system in the construction industry.

During the Second Plan, some attempts at regional developments were made which resulted in the creation of a number of Regional Development Authorities (RDAs), (McLachlan K 1988). An Italian consulting firm, Italconsult, was contracted to survey the development potential of Sistan, Baluchistan and part of Kerman (Amirahmadi 1986, p512). One of the most important RDAs was the one billion dollar scheme in Khuzistan based upon the experience of the American T.V.A programme. It began in 1956, as the result of a 15-year agreement signed between the Plan Organisation and the Development Resources Corporation (DRC) of New York. Khuzistan Development Services a subsidary of DRC, was formed to coordinate exploitation of all the resources of the region by principles of close cooperation between public and private groups and agencies as learned from the T.V.A experience while taking account of local conditions (Amirahmadi 1986). The most important part of the DRC programme was the development of a system of dams and canals to provide water for some 175,000 acres. The 665 foot high con-

crete dam (formerly Mohammad Reza Shah Dam) constructed in 1962 over Karun River was the key unit in this plan (Wilber 1981, p293).

The results of the Second Plan are difficult to evaluate, due to the lack of clear objectives and quantitative targets. Lack of a comprehensive approach to planning during this period was a major contributor to the 1960-62 recession when the Iranian government had to go to the IMF for help and had to embark upon an "Economic Stabilisation Programme" as prescribed by the agency (Pesaran 1985, p21). The ineffectiveness of the planning system and the implementation organisations was to blame for the shortcomings of the Second Plan.

3:2.2 The Third Development Plan (1962-67)

This was Iran's first attempt at comprehensive planning launched at a time when both public and private investment had lost momentum because of the economic stabilisation programme of 1960-62, (Mofid 1987, p47). It coincided with the Kennedy administration which had let it be known that it would only continue to support the Shah on condition that he put through a programme of reforms (Halliday, 1979). This was to severely affect the forecasts of the Third Plan.

According to Razavi et al (1984), the Third Plan was severely limited in its comprehensiveness from a methodological point of view. Furthermore;

> "..No formal models or programming methods were used, and no attempts were made to obtain general equilibrium-type (simultaneous) solutions. Rather, the basic method of planning resembled Jan Tinbergen's "stage method", a trial-and-error process that could not be used in its entirety due to a paucity of statistical information." (p30).

However in terms of its overall objectives, the Third Plan was a success. It achieved at least a 6 percent per year real rate of growth in GDP (Pesaran 1976). During the Third Plan, a new form of regional planning was initiated in Iran: the regionalisation of the sectoral programmes. A number of modern and large scale industrial and agricultural growth poles were set

up, as the result of a response to the alarming over-concentration of socio-economic and administrative activities in Tehran (Amirahmadi 1986, p513). In pursuit of this strategy, Esfahan, Tabriz, Arak, Ahwaz, and Ghazvin were chosen as industrial poles and agricultural poles were created in Gilan, Gorgan, Minab, Esfahan, Khuzistan, and Azarbaijan. Because of the importance of the Land Reform Programme the next section will provide a review of this programme before returning to the examination of the Fourth Development Plan.

3:2.2.1 The Land Reform Programme

The "White Revolution", a series of social and political reforms the most significant of which was the Agrarian Land Reform was launched by the Shah in 1963 (McLachlan 1988). As this was seen as an American intervention by the opposition groups, it gave rise to the June uprising of 1963 which was put down brutally by the Army (Afshar H 1985, p58-79).

The implementation of the Land Reform Programme was the responsibility of the newly established Land Reform Organisation (LRO) staffed by a number of committed engineers and administrators (McLachlan 1988, p112). The activities of the LRO was coordinated by the Land Reform Council (LRC), whose members included a Chairman appointed by the Agriculture Minister, the Head of LRO and four other senior members of the Ministry. The land reform programme was carried out in three phases between 1962 and 1972. The first phase was to affect land transfer in 13,907 villages as the result of the 1962 decree (McLachlan 1968, p689). Whilst phase one respected the right of landlords to retain orchards, plantations and woodlands above the stipulated maximum holding of 400 hectares for irrigated land and 800 hectares for dry land, phase two withdrew these rights (Lambton 1969, p56). At the same time, phase two allowed landlords to keep mechanised cultivated land of up to 500 hectares. By 1966 some 14,878 villages or part villages (90% of eligible villages) were bought from the landlords (Daftari 1973). In the hope of consolidating the ownership and management of land into larger units and encouraging accelerated growth, the government introduced a twenty-point manifesto in January 1967, to mark the beginning of phase three (McLachlan 1988, p117). The real reason for ending the fragmentation of land was the desire for a rapid mechanisation of farming

parallel to the government's aim of industrialisation during the Third Plan. By 1971, the end of phase three, the government announced that some 800,000 tenants had received ownership under phase three regulations.

In 1968, however, the Law for the Foundation of Farm Corporations was introduced, and at the same time the LRO was converted into the Ministry of Land Reform and Rural Development. As McLachlan (1988) notes:

> "this facilitated the establishment of joint stock companies in which the beneficiaries of land reform and, on occasions, others in the same village, could lodge their land in return for an equity holding". (p118)

The impact of the "White Revolution" and, more specifically, the Land Reform Programme, on the rural areas of Iran has been the subject of extensive studies (Lambton, 1969; Aresvik, 1976; Afshar H, 1985; Amirahmadi, 1986; 1987 & 1989, Halliday, 1979) and it has been attacked by both the left and the right. But as McLachlan suggests:

> "The reforms brought very specific social changes in the village communities mainly through the operation of the land reform laws throughout their various phases. The so-called five hundred major land-owning families were hit hard by the first phase of the reform and were eliminated gradually thereafter.....it might be concluded that reform was necessary in rural Iran; commentators from all points of the political spectrum agreed that this was so. To be of any significance it had to change at least one fundamental component in the agrarian structure, and land was the obvious one to choose. Yet, in changing land ownership it was inevitable that all other elements would change their relative positions in the social as much as in the economic hierarchies". (McLachlan 1988, p148)

It should be noted that, the allocation of land to small farmers close to most towns and major cities had a long term impact on the expansion of these cities. This was particularly profound in the late 1960s and early 1970s as the urbanisation in larger scale occurred. Unlike the role of small farmers as major source of land supply in the urban areas of Japan which are very powerful both politically and financially, the small farmers in Iran did not realise their potential power. They

soon sold their newly accquired land to rich city dwellers in search of cheap land in the periphery of urban centres.

The majority of the latter landlords, who knew the value of such land have kept such land and are presently parcelling this illegally and selling them to new low income settlers who arrive from the countryside. For example the growth of Mashhad to the North is the result of the conversion of such agricultural land to low income residential areas.

3:2.3 The Fourth Development Plan (1968-72)

The Fourth Plan was the most comprehensive plan formulated prior to 1979. The formulation of the Fourth Plan exhibited on the one hand an extent of maturity in the planning process and machinery. On the other hand (Razavi et al 1984, p31), the question remains as to whether the success of this plan resulted from the planning process entirely or was merely a coincidental piece of good fortune (Mehner 1978). The Fourth Plan continued the emphasis on the industrialisation policy which had started during the Third Plan (Nattagh 1984). As part of this strategy, an evaluation of comparative natural resources and development potential of suitable regions began, in order to determine development poles in regions of high potential, and to concentrate investment in such poles in order to attain maximum output and accelerate the rate of national economic growth.

The relatively stronger regional emphasis during the Fourth Plan, especially in the more developed regions, was pronounced in the development of infrastructure, housing and industrial activities (P.B.O 1977). This in turn induced more construction related activities in these regions thus strengthening the local construction companies requiring no dependence upon finance or control from Tehran, The construction activity induced as the result of the growth pole strategy was particulary strong in Esfahan, Khurasan, Fars, Gilan and Bakhtaran. According to Amirahmadi et al (1987):

> "Amongst the measures introduced to reduce regional disparities in the Fourth Plan mention can be made of the establishment of Saheli and Kurdestan Development Authorities, both devoted to improving living standards

> in these less developed provinces". (Amirahmadi & Atash 1987, p171)

3:2.4 The Fifth Development Plan

On March 21, 1973 the Fifth Development Plan was launched. Although basically a continuation of the Fourth Plan, its financial allocations increased by more than 110 per cent. In 1973 oil prices increased rapidly due to the Arab-Israeli war, bringing a dramatic increase in the foreign exchange revenues of the Iranian government (McLachlan 1977). The Fifth Plan contained more elements of regional planning as Amirahmadi et al (1987) note:

> "The Fifth Plan was even more conscious of the problem of regional disparities, particularly in social conditions. Emphasis was thus shifted to the provision of social services (including employment). To this end provincial plans included, in addition to 'regular' projects, programmes specifically designed for particular provinces (called 'special' projects) and 'tribal complexes. The new integrated regional development policy also paid special attention to agriculture." (Amirahmadi & Atash, 1987, p171)

The initial version of the Fifth Plan, based on 1,993.7 billion rials covering current operation and development allocations, was revised and raised to 2,848.5 billion rials. This was to have a dramatic impact on the socio-political situation of Iran (P.B.O 1975). The planned inflationary policies of 1974-1976 which had given rise to a period of economic boom, resulted in an overheated economy, characterised by a considerable waste of resources and the disruption of economic growth (Looney 1977). By 1976/77, the economy was out of control and the budget surplus of 249.7 billion rials in 1974/1975 had changed into a budget deficit of 178.8 billion rials. Once again Iran had to turn to international money markets for survival (Mofid, 1987, p110). In 1976, the revised Fifth Plan was abandoned and preparations were made for the Sixth Development Plan. According to Razavi et al (1984);

> "a new planning procedure was adopted, giving all executive agencies an input into the plan preparation process: there were doubts about the practicality of this proce-

> dure, but it was abandoned before it could be tested. In 1978, the Shah decided that the economy no longer needed five-year planninq and called, instead, for long-term planninq quidelines, toqether with a one-year development budget. This was presumably the end of planning activities during the reign of the ancien regime" (p36).

In this way economic development planning in the pre- 1979 era came to an end. Appendix 5 provides a resume of the process of planning and implementation in this era. The impact of these policies on the construction process will be fully explained in Chapter Four. The next section reviews the nature of economic development planning since the Revolution of 1979.

3:3 Development Planning Since 1979

The revolutionary regime came to power in 1979 on the back of an economic disaster and a parallel revulsion at the failure of the Western style modernisation of the mid-1970s, with which the Shah was irrevocably connected. In the early years of the revolution there seemed a good likelihood of a coherent Islamic philosophy emerging that would enable a new management style for the economy (M.E.R.I, 1985). There was a flowerinq of both Islamic and socialist thinkinq on the matter of economic policies which advocated the need for independence from the outside world, a rejection of any modernisation that merely imitated the Western tradition and a restructuring of ownership assets. Those with Islamic leanings were eaqer to see all institutions connected with the economy act with Islamic principles. Radicals of the secular left, meanwhile, urged the imposition of a centrally controlled plan based on Socialist/ Marxist foundations (E.I.U. 1987). In practice the government is in favour of the promotion of agriculture in order to develop the rural areas. Aqriculture is perceived as the source of all Iranian virtues, as well as influencinq the lives of the majority of ordinary Iranians. Large scale industrial structures were to be abandoned as inappropriate for Iran and were judged to be partly the cause of Iranian external dependency.

Secular politicians and many of the political left were anxious to reshape the economy and ambitious plans were prepared for development. Although the plan was adopted by the

Majlis it never became effective since funds were not allocated to it. In 1980 the war with Iraq began and the economy plunged into a period of recession. During one brief interlude from depression, in 1983, it was not the economic plan which was revived but projects taken on a random basis from among those that had been under preparation or construction by the Shah's regime at the time of the revolution. Large scale prestige schemes such as major iron and steel plants, the Bandar Khomeini petrochemical plant and even nuclear power stations came back into fashion. All of these had been criticised at length by the opposition before 1979. In the event the boom soon passed and development faded once again (E.I.U 1987).

Although initially there was some resistance to the idea of planning by some elements in the new regime, by 1982 it was realised that it was impossible to run the country without any coherent planning policy. Within the Plan and Budget Organisation itself, there was serious confusion with regard to the role of the PBO (Razavi et al 1984, p113). In addition to the doubt about the necessity of a planning system within the framework of the Islamic system, there was a continuing question mark over the issue of private ownership, which appeared to be an obstacle to economic planning. Finally, by 1982, the planners decided to overlook this obstacle and they embarked on the development of a new planning mechanism.

3:3.1 The Development of a New Planning System

After much deliberation finally, in January 1982, the planners within the Plan and Budget Organisation (PBO) submitted a document entitled "The National Planning System" to the Economic Council (EC), which was subsequently approved (AMIRAHMADI, 1989). The new system of planning envisaged processes of long-term, medium-term and short-term planning for the overall development of the country. These could be outlined as:

(1) A twenty-year long-term plan which will determine the overall course of economic development;

(2) A Medium-term (five year) plan which is prepared within the framework of the long term plan;

(3) Sectoral plans for the development of the various sectors

of the economy within the framework of the medium-term plans;

(4) National Projects within the framework of the sectoral plans;

(5) Regional Development Plans and Projects that should be implemented at the regional and rural levels within the framework of the medium term and sectoral plans. (P.B.O 1982)

The proposed planning system has been delayed in its full application by the priorities that have been dictated by the prolonged war. However it has been noticeable that many aspects of national administration have proved resilient and have evolved despite the nation's war effort. This resilience has not received much attention outside Iran. The proposed system has a centralised decision making process for the just allocation of resources in all regions and a decentralised decision making process for the implementation of the overall development plan. The appraisal of the existing economic resources is carried through the cooperation between the central and regional authorities. This process is a prerequisite to the development of different economic sectors central to the overall aims of the long term development plan. The spatial distribution of resources amongst regions is carried out by consultation of the central and regional planning authorities. As Amirahmadi notes:

> ".... there are significant amounts of untapped natural and human resources at regional level that wait to be utilised.." (Amirahmadi 1987)

This can only be achieved by the cooperation of regional planning authorities. It is imperative that decision making about activities which can determine the potential resources and the overall goals of the country is limited to the central authorities.

At the regional level, within the framework of the National Plan, the allocation of the regional budget to different projects is determined by the regional authorities. This regional decision making process provides for the participation of authorities and people in the realistic preparation of the

regional development plan. This promotes the use of valuable information that is scattered in the regions in the planning process. It is the utilisation of such local knowledge which allows for the preparation of realistic plans (P.B.O 1982).

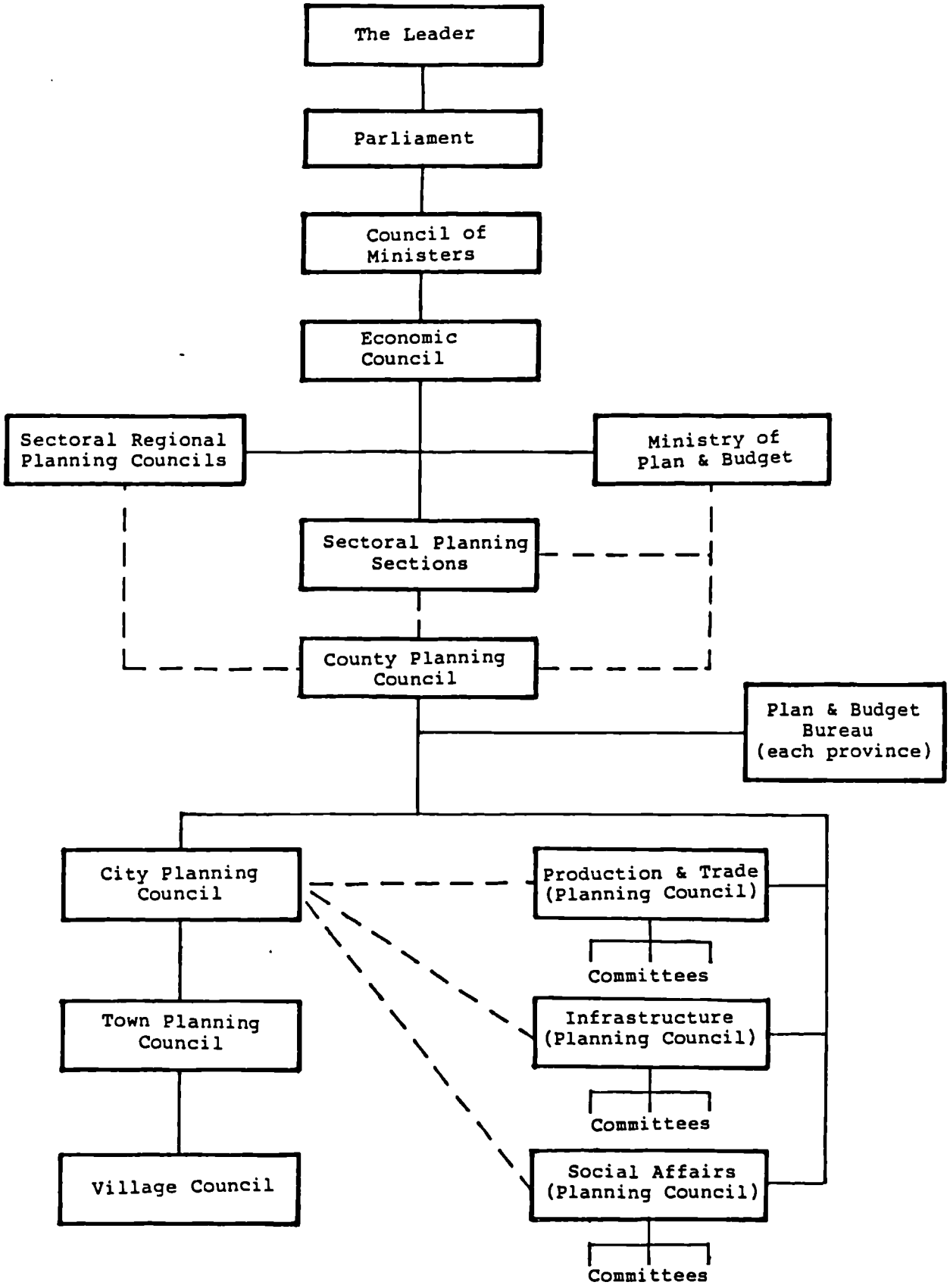
Diagrams 3.1 and 3.2 show the overall organisation of the planning system which is the translation of the Chart in the "Planning System" document released in 1982. It is important to point out that, "The Leader" refered to Khomeini, (who died in May 1989) but he never intervened in the process of economic development planning, unlike the Shah who personally set the goals of national development in the 1970s. In the new system, parliament plays a more important role, contrary to the symbolic role it played prior to 1979. In the new planning system all experts, organisations and councils at various levels, including village, town, city, province, various ministries, the MPB, the Council of Ministers and parliament, and all interested people or parties officially or unofficially participate in the preparation and finalisation of the economic development plan. The communication channels between different sections and agencies is illustrated in the Chart with the use of numbers (for details of the procedure refer to Appendix 6).

The new planninq system is comprehensive compared with the previous planning system (Diagrams 3.3 & 3.4). This means that the plan pays some attention to the cooperative and private sectors. The private and cooperative sectors are both directed by various economic arms, including the banking system, taxation, price control and other similar measures. The new planning system, directives, models, decision making process, the type and relationships and direction of flow of information and decisions have matured over time. According to one of the MPB officials:

> "This is possible because of the flexibility of the new system which allows for modifications over time. In order to achieve this, one of the divisions of the MPB is responsible for monitoring and supervising the planning system which informs the Planning Council of the MPB of its findings". (personal interview April 1988)

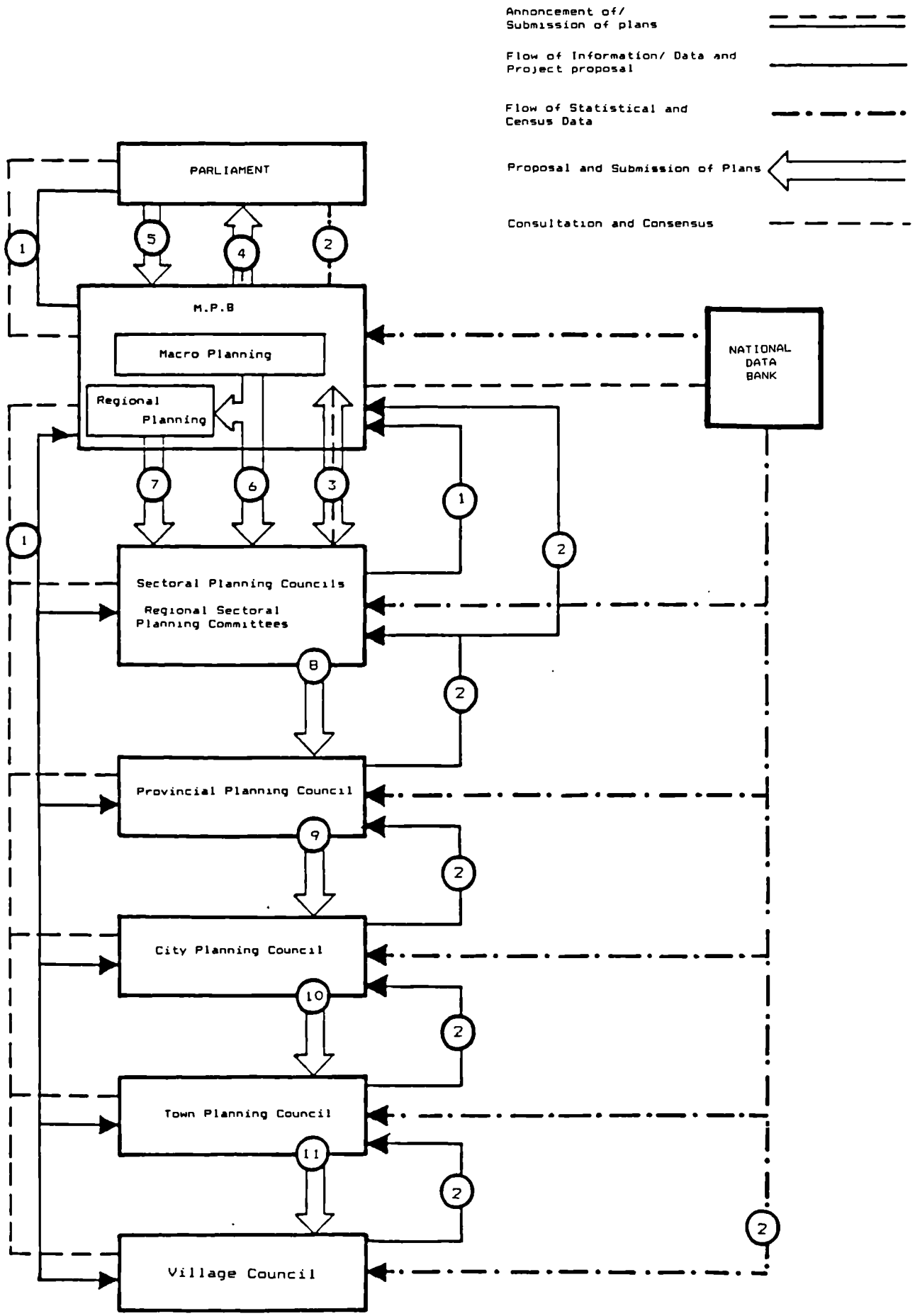
With regard to the soundness of the new planning system Razavi et al (1984) state that;

Diagram 3.1. The Organisation of Planning in Iran: Post - 1979



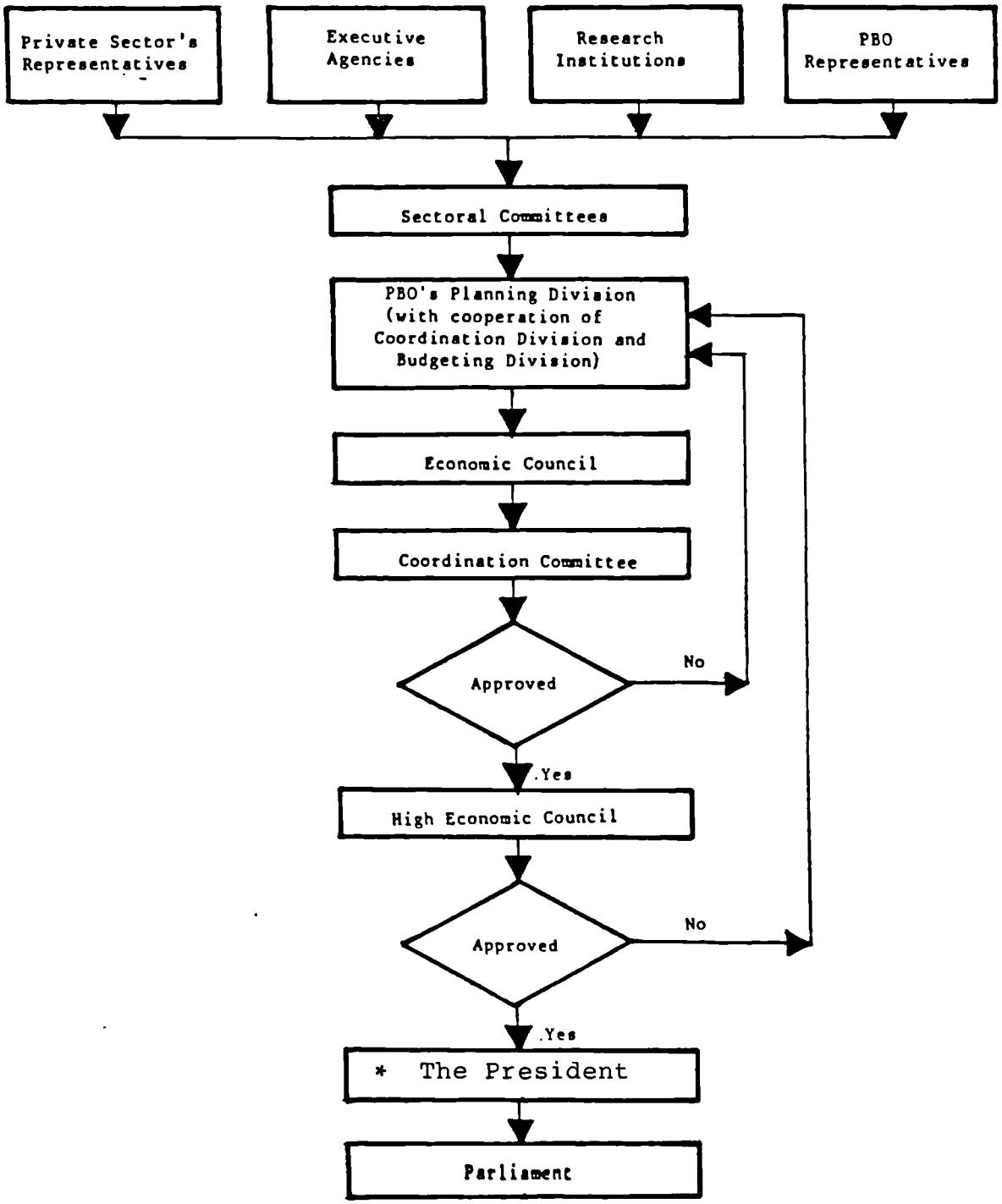
Source: Ministry of Plan & Budget, 1981. "The Planning System" Translated by author)

Diagram 3.2 The Institution of Planning in Iran: post-1979



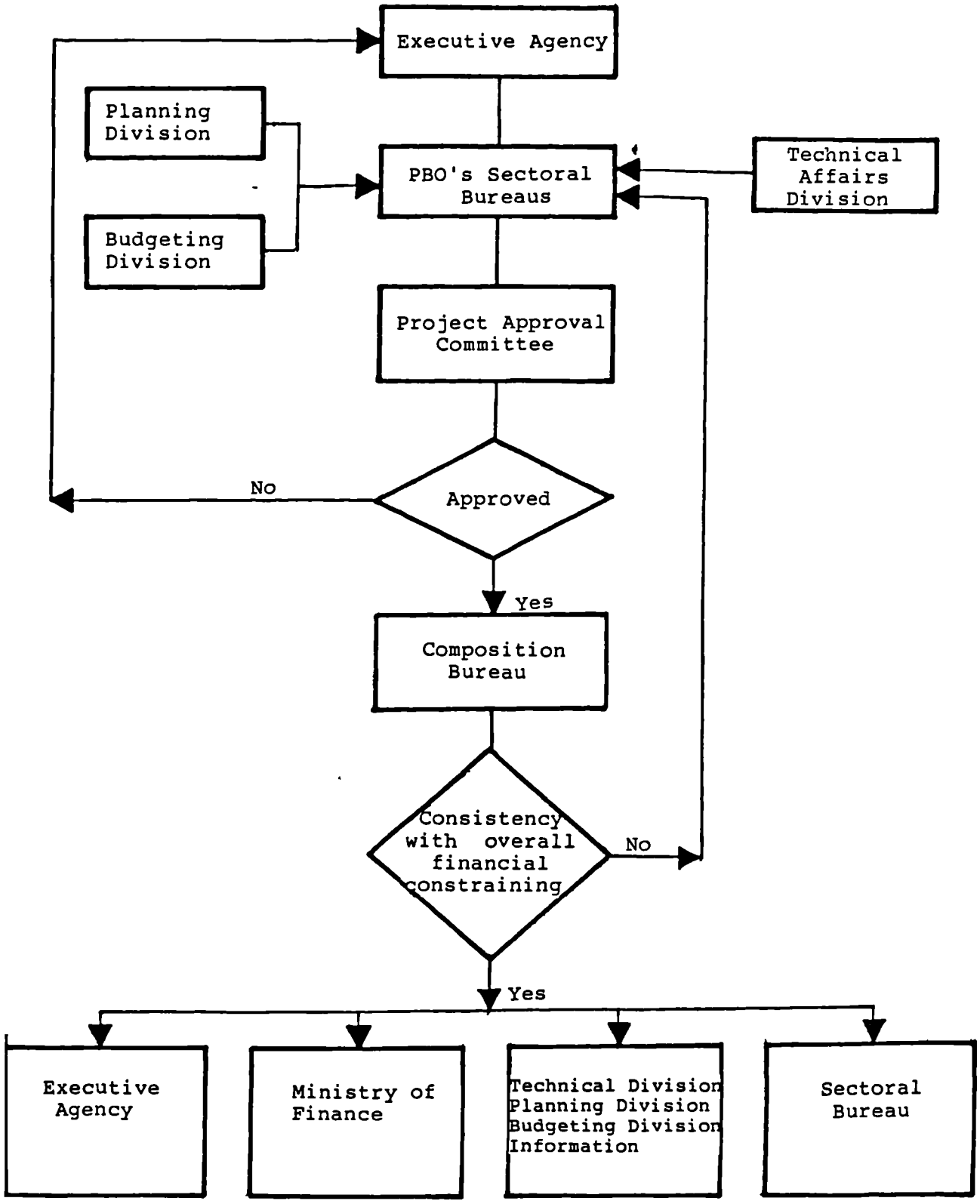
Source: Ministry of Planning and Budget, 1981. "The Planning System. Chart II, translated by author.

Diagram 3.3 Preparation of Development Plans



* This post was held by the Prime Minister prior to changes in the Constitution in July 1989.

Diagram 3.4. Implementation of Development Plans (Project Approval Process)



Source: Razavi H & Vakil F, 1984. The political environment of economic planning in Iran: 1971-1983: From Monarchy to Islamic Republic. Boulder, Westview Press.

> "... although it is too soon to make any judgement with regard to effectiveness of economic planning under the present regime, it seems that some fundamental problems have been resolved. The issue of Islamic economics has been dropped for the present time, and a mixed economic system has been adopted. The establishment of the institutions required to implement this plan will, of course, be a real challenge to the Islamic regime, but it seems achievable. However the crucial determinant of the planning system's success is the political support it must have". (p120)

Despite the claims of the officials, on the face of it such a bureaucratic mechanism seems unlikely to be sufficiently flexible to adapt to economic, social and, above all, political inflexions.

3:3.2 The First Five Year Development Plan Since 1979

The deteriorating economic and financial conditions of the country in 1978/79 made development planning virtually impossible and the new political regime which came to power in 1979 did not offer economic policies or specific programmes for development. In March 1980, allocations were made to various sectors in the 1980/1981 budget. This was, however, abandoned in mid-year as funds on all government accounts ran short (E.I.U, 1980, p8). The same pattern emerged in the following year's budget but now with the added difficulties of the war. In 1982, $5 bn was allocated to the reconstruction of the war damage in the south of the country alone. In 1983 the government earmarked $10 bn for development spending, but offered no integrated targets for development and planning to be undertaken on a ministry by ministry basis.

The continuation of the war has drawn off much of the available foreign exchange to the defence budget. The shortages of trained personnel in almost every department has further complicated the government's efforts in devising and implementing a comprehensive development plan. A dedication to development has been increasingly sought by the authorities but, the inherirted economic policies could not have been readily abandoned for political reasons.

Once the new planning system was approved, the PBO set out to prepare the first development plan of the new era. Despite all the aforementioned difficulties, the government announced the first Five Year Development Plan in 1983, for 1983/84 to 1987/88, as part of a 20-year development strategy. It aimed to work towards 'economic independence' with the domestic production of a wide range of goods, and with a diversity of trading partners whilst recognising that Iran would be dependent on oil revenues at least in the short term. The plan proposed an expenditure of $166 bn, of which 60% was to be provided by the state and the rest by the private sector. Services, construction and agriculture became the major areas of investment, with the private sector almost exclusively concerned with agriculture and construction. Seeking to emphasise investment rather than consumption, the plan's priorities were set out to be:

- utilise current spare capacity in industry and increase productivity
- develop the intermediate and machine-tool industries
- expand agriculture and develpe rural areas
- integrate the oil industry more closely into the activities of the domestic economy as a whole
- overcome the shortage of skilled labour by boosting education. (M.P.B, 1983).

Hasty adjustments to the plan, made during its passage through parliament (Majlis), to bring it more firmly oriented towards the reconstruction of the domestic agricultural sector, lacked credibility. The legal framework within which the private sector could cooperate remained uncertain as the result of the new labour law which made a 40% capital stake in the plan by individuals in the private sector extremely unrealistic. In the meantime, there has been a continuing ad-hoc approach to development in which the strength of individuals to pre-empt resources has been more formative than the guide-lines of the plan (MERI Report, 1985).

One benefit of the government's growing awareness of the problems of farmers has been brought about by the requirements of the state policy, in this case the possibility of a build up of defence potentials in the south east. Small scale programmes for local irrigation schemes, using shallow wells with diesel pumps, have been encouraged throughout the country. A combination of pressure to reduce unemployment and to make

good deficits in imported goods through improved domestic output, as well as the sheer scale of local requirements in the war that cannot be met from abroad as a result of foreign boycotts, have had the effect of forcing the government to breathe some new life into the industry.

As the war progressed the economic situation in the country declined further. The GDP of 1984/85 and 1985/86 turned in 1986 into a steep decline; by at least 10% during the year 1986/87 to March 20, 1987. The drop in value added arose largely from the fall in oil prices. Less generous assessments show an accentuating real decline in GDP since 1984/85 to less than 75% of the 1984/85 figure in 1986/87 (E.I.U 1987).

The budget for 21 March, 1987 to 20th March, 1988, as reported by the Minister for Plan and Budget, was based on the model of the previous year. The war budget took priority over all other sectors, while the allocation for the civilian budget was 25% for development and 75% for other requirements. In the aftermath of the eight year war, the MPB has commenced the preparation of the Second Five Year Development Plan with consideration given to the reconstruction of the war-damaged economy. It has so far proposed the introduction of special taxation, the "national reconstruction levy" in order to pay for the cost of reconstruction, which is currently being debated by the Parliament (I.R.N.A, 1989).

The review of the First Five Year Development Plan in the new regime brings to an end discussion on new attempts at development planning; the following section will examine the role of planning institutions.

3:4 Planning Institutions

The administration of the government sector is carried out by a number of ministries, each responsible for specific functions. Each ministry is comprised of a number of autonomous organisations affiliated within it: some are called government agencies which carry out certain of the ministry's functions; others are government enterprises or corporations which operate on commercial lines (Razavi et al 1984, p37-38). The various government corporations were established as the result

of parliamentary acts their financial composition consisting of 50% government capital and 50% private share holdings. The latter became nationalised in the aftermath of the 1979 revolution.

Except for the activities of the municipalities, all other public sector activities are financed by the State General Budget. The President is responsible for the State General Budget according to the law, and the Ministry of Plan and Budget is responsible for this function. Other institutions involved in the preparation of plans and the State Budget include the Council of Ministers, the Economic Council, the Ministry of Economic Affairs and Finance, and the Ministry of the Interior.

3:4.1 The Council of Ministers

The Council of Ministers (Heyaat-e Dowlat), chaired by the President since July 1989 is the highest policy making body. It comprises twenty ministers and five ministers of state. The Economic Council is in charge of development planning, budgeting and implementation, and is chaired by either the newly appointed Chief of Ministers or the President himself (I.R.N.A). The Cheif of Ministers replaces the Prime Minister and in effect acts as the vice-president. Other members of this Council include the ministers responsible for planning, budgeting, and social and economic affairs, and the Governer of the Central Bank of Iran (Razavi, et al 1984, p40).

3:4.2 The Ministry of Economic Affairs and the Ministry of the Interior

The forecasting of revenues and other sources for the attainment of development funds is the responsibility of the Ministry of Economic Affairs with the cooperation of the MPB. The Ministry of Economic Affairs is also responsible for the collection of government revenues through the Treasury, which handles all government receipts and payments. Another government agency involved with development planning is the Ministry of the Interior; through its subsidary organisation, the State Organisation for Administration and Employment. The functions of these organisations include:

a. the formulation and coordination of overall activities and improvement of management and organisation of the government sector;
b. to propose solutions to problems of government organisations;
c. to conduct a programme of management studies, research, and services designed to promote management methods and procedures and;
d. to give guidance and advice to government agencies, toward improving their management and organisation". (Razavi et al 1984, p40)

3:4.3 Ministry of Plan and Budget

The present Ministry of Plan and Budget (M.P.B) was established in 1949 as the Plan Organisation (P.O), later known as the Plan and Budget Organisation (P.B.O), for the task of controlling and directing development planning activities. The Plan and Budget Organisation was changed into the Ministry of Plan and Budget (MPB) in the mid 1980s, thus reflecting the importance that the new administration attaches to planning. The wide range of the M.P.B's functions and responsibilities demand both a high degree of managerial competence and a complex administrative structure within the Ministry itself.

The Ministry of Plan and Budget, is the central core of the planning institution and its basic functions are;

a. to carry out social and economic surveys and studies in order to formulate plans and budgets and to prepare social and economic reports;

b. to prepare long-term plans, in conjunction with executive agencies, for submission to the Economic Council;

c. to prepare quinquennail development plans;

d. to propose to the Economic Council guidelines and policies relating to the State General Budget;

e. to prepare and draft the State General Budget;

f. to exercise ongoing supervision over the country's statistical procedures and programmes;

g. to evaluate the productivity and performance of executive agencies and to submit reports thereon to the prime minister;

h. to examine the reports and questions to be discussed by the economic Council;

i. to determine the competency of and to calssify consulting engineers and contractors;

j. to establish standards, criteria, general principles, and general conditions of contracts relating to development projects;

k. to determine and define terms of the foreign loans and credits that have been reserved for projects and programmes;

l. to control permanently the execution of all approved plans, programmes, activities and projects by the executive agencies;

m. to keep the prime minister informed as to the progress of the programmes, projects, and activities with respect to the work programme proposed, the work actually initiated and the work completed;

n. to prepare and present biannual progress reports in conjunction with development projects and programmes and to compile and submit annual economic reports and comprehensive operating reports for each planning period;

o. to contribute to the promotion of regional planning, budgeting and administration in order to achieve balanced interregional and intra-regional development through decentralisation within the national context; and

p. to establish a national database

Source: Razavi et al, 1984, p39.

In the early 1970s the P.B.O consisted of a number of main administrative divisions, each headed by an under-secretary.

Such a complex pattern of ministries, divisions and dependent agencies is by no means peculiar to Iran. Indeed it seems the product of a resource rich nation anxious to acquire the expertise of others. Whoever has visited to advise has left behind a new layer of government agency. Curiously even the most radical of doctrinaire revolutions apparently leaves the intricacies of these layers intact, merely tinkering with parts of bureaucratic mechanism.

There are other ministries and newly created agencies involved in the process of economic planning and the physical development process whose roles will be discused in later parts of this chapter (for details of the work of various divisions of the M.P.B refer to Appendix 7).

The following section, however, focuses on the process of physical development planning after a contextual review of Iranian urbanisation.

3:5 Urban Planning

The origins of urban planning in Iran have been traced by some scholars to the time of the Caspians of Northern Iran when the first agriculturalists settled. This is based on the fact that it was cultivation alone which allowed the wandering nomads to settle and to multiply to the point where the formation of settlements and towns was possible. This claim is based on the archealogical findings of metal objects (3000 B.C. to the first millenium) in the Caspian highlands (BorBor 1975). Highly planned and sophisticated cities existed; including first of all Ecbatan; then Pasargade and Perspolis; then Rhagae, near Tehran; Tausa near Mashhad and, within 150 years, an Empire was established. This marked the beginnings of administration and planning on regional and global scales (Herzfeld 1935).

The new imperial city of Esfahan was constructed between the old town and the river in 1598 by the Safavid rulers. Shiraz, close to the Achaemenid capital of Persepolis which was destroyed by various invaders, came back to life in the middle of the eighteenth century (Wilber 1981).

The choice of Tehran as the capital by the Qajar Rulers in 1788 was the beginning of the growth of the present day city. As the various Qajar rulers made several trips to Europe, especially between 1848-1896, Tehran's development emulated European Towns, with the introduction of a horse drawn tramway, hospitals, power stations and other administrative structures. By 1867, as the result of physical expansion, Tehran had six districts (Bahrambeygui 1977). The population had reached 170,000 by 1896 (Wilber 1981) and did not have major problems including spatial segregation amongst the social groups (Amirahmadi 1982).

However, planning activities in the 19th Century; ie, the later years of the Qajar period (1840-1850); included the introduction of "health regulations" and "city assemblies" (Adamiat, 1972) as the first steps towards environmentally desirable life conditions and direct participation in the management of city affairs by the people. The "city assemblies" were designed to have wide ranging powers over tax distribution, public domain revenue, conscription, tribal affairs, censuses, pensions and urban public affairs. In the management of urban affairs, the assemblies' power covered issues such as street paving (financed by residents), the installation of public lavatories, street cleaning and the construction of streets and alleys (Ghaffarzadeh 1981, p125).

The assemblies were also required to advise the government on the development potential of the cities, but they were dissolved by 1875 (Adamiat 1972, p221). The constitution revolution (1906/1909), as an urban movement, had a profound impact on Iranian cities in the way that it challenged the power of the tribal royals. Throughout the revolution the city management was in the hands of provincial and city assemblies composed of noble people such as merchants, craftsmen, clergy, journalists and writers (Kasravi 1978).

It is correct to state that the city assemblies were the first example of public involvement in the process of decision making at the city level. In order to acknowledge the revolution, the constitutional law paved the way for the establishment of "provincial and city assemblies in all the country" with "total supervisory power over all public affairs" apart from the financial issues (Government of Iran 1968). The 1906-1909 reforms were mostly introduced by intellectuals labelled as "western looking" reformists (Ghaffarzadeh 1981, p126)

mainly because of the disapproval of the ruling powers i.e. Qajar tribal royals, land lords, administrators and sectors of the clergy. Because of their novelty, none of the reforms lasted long enough to have any real impact on civic life.

However, twentieth century planning in Iran did not start prior to 1925 when many Iranian cities underwent drastic physical changes, which meant a transformation from a rural to an urban character in some cases and disregard for traditional physical features in others (Mozayeni 1974). The legal basis for these physical innovations was the Street Widening Act of 1933, which authorized municipalities to widen the traditional narrow paths of Persian cities to small scale but Haussman-like streets.

Changes in the urban affairs administration during the Reza Shah period (1921-1941) very much reflected the characteristics of the national social and economic conditions of the period. With the growth in the size and power of the state the process of the participation of the people in decision making ceased. At the same time administrative organization and the ministerial structure of the state expanded at the city level by the creation of various departments with authority over different aspects of urban activity. Much effort was made by the government towards creating a western style society, and reforms such as street electrification and renovations included construction of wide straight streets normally converging on a central square.

The Municipal Act of 1913, was the first legislation of its kind in the country, its main concern being street cleaning and control over fair distribution of bread, meat and other substances (Mozayeni 1974). The 1930 Law of Municipality and the Charter of Municipality Councils laid down the foundations for the establishment of municipalities and city councils in towns and cities of 5000 and more population (Vatani 1986). A series of regulations and laws passed by parliament enabled the municipalities and government departments to function properly. These included the 1930 Compulsory Purchase Act empowering the municipalities to acquire land for street extension. The same law created the request for building permission issued by municipalities and for city plans. From this time on the administrative and policy changes caused much of the growth of urban population in general and in Tehran in particular. The increase in population resulted in an increase

in demand for urban land which prior to this time was relatively cheap. The 1932 Land Act made provision for the obligatory registration of urban land with the government. The law also required a proof of ownership concerning unclaimed or disputed land (Vatani 1986).

Apart from the oil city of Abadan, run by the Anglo Iranian Oil Company and a few earthquake devastated cities such as Shahpour and Quchan, no comprehensive plans, physical or otherwise (Ghaffarzadeh 1981, p128), were initiated during this period. By the end of 1941 many of the elements which later characterised the development of urban planning activities in Iran were present. It could therefore be assumed that during this period urban planning activities were confined to isolated projects geared towards the provision of electricity, purified water, asphalted streets and housing projects which were few and far between.

Other town planning legislation consist mainly of the Municipal Act of 1955 with its 1965 amendments and the Urban Renewal Act of 1968. The latter presented in detail the duties and election of mayors and the organisation of municipal councils and municipalities. It also provided regulations for new development, slum clearance, development control, and a number of town planning recommendations (Borbor 1975).

The 1979 revolution and the start of the Iran-Iraq war of 1980 initiated a massive population movement, causing large scale migration from the countryside to the urban areas and also from the war affected cities to other cities. This has put an added burden on the government to provide sufficient services at the city level. As the consequence of the introduction of some policies regarding the allocation of land to low income people in the urban areas a large number of people moved to cities almost overnight. The government, realising their mistake, embarked upon a never ending vicious cycle of fighting urbanisation (Diagram 3.5).

The policy makers have had to tackle the situation amid rising unemployment and the devastating effect of the war economy which has brought with it problems that are very new to Iranian society. Thus the urgency of the situation has forced the authorities to pay attention to the rural areas, despite the fact that the bulk of manpower for the war effort is composed of rural agricultural workers.

Diagram 3.5. Urban policies in Iran since 1979.

URBAN POLICIES	
Decentralisation	PROMOTION OF: Secondary Cities
Limiting CITY GROWTH	RESTRICT Control of Metropolitan Areas
Discourage MIGRATION	IMPROVEMENT of Rural Areas

The worsening situation in the cities, and in particular Tehran with an everlasting housing shortage and the deterioration of urban services, cannot be ignored, as it makes it difficult for the government to invest less in the urban areas and more in the rural areas. An example of this can be found in Tehran, where for the past 20 years there has been talk of building a Metro system in order to alleviate the traffic problem. Despite much critism from every quarter who argue that a subway for Tehran is more a prestige project than a real necessity, the government finally decided to commence construction of two lines from east to west and from north to south at an estimated cost of 250,000 m Rls, (Haami 1987, p1-3). A more detailed discussion of such projects will be presented in a later part of the thesis.

This concludes the examination of the evolution of city planning activities in Iran in its modern form, the next section will identify the different agencies involved and their role in physical planning.

3:6 Physical Planning Process

As was seen in the previous section, physical planning in Iran came to life in the first half of this century with a forceful movement towards modernisation, at the same time that preparations for development plans were underway. However, in the 1960s, with the emergence of the Ministry of Housing and Urban Development, steps were taken for the preparation of Town Master Plans. Between 1962-1982 the M.H.U.D commissioned a number of well known national and international consultant groups to prepare comprehensive and detailed plans for 89 cities, of which 60 plans had been approved before 1982, the remaining 29 being cancelled because they became out of date.

At the same time the Ministry of the Interior, through its Regional Technical Offices and the Central Technical Office, started the preparation of Guide Plans for 264 towns (P.B.O 1983, part 17, p1). Table 3.2 illustrates the state of plans for various cities up to 1982. It was hoped that during the Five Year Plan of 83/84-87/89 a total of 466 city plans including Comprehensive, detailed, and guide plans, together with a number of urgent crash programmes for the war affected cities, would be prepared.

Prior to 1979 the city level of physical planning in Iran overemphasized the role of the Master Plan. Planning was about the preparation of plans and little else, particularly in the 1960s. As with the situation in other countries, large scale reshaping of cities took place where master plans were formulated without sufficient regard to the fabric of cities and to the capacity of the urban system to respond. The best example of such planning practices is that of Mashhad. During the late 1960s and early 1970s, the whole fabric of the city especially that of the histroic centre were totally reshaped. Avenues of up to 60 metre wide were constructed as the result of bulldozing the old and historic part of the city. This will be touched upon in Chapter Four.

Although great amounts of trivial system data were collected there seemed an utter disregard for the common sense motor mechanism of the locality in question. Thus not even the financial and technical capabilities of the municipality were considered. Spaces, roads and quantities of buildings were calculated entirely on projections and the application of standards. The abilities of the construction sector to respond

to the capability to finance and the technical consequences were never part of the planners' agenda.

Table 3.2. The number and types of plans for the cities of Iran in 1982.

City Group	No of cities in each group	Type of Plan		
		Master Plan	Guide Plan	Total
Tehran	1	1	-	1
Large cities	9	5	-	5
Medium large	23	11	-	11
Medium small	81	35	25	60
Small towns	352	8	239	247
TOTAL	466	60	246 264	324

*Tehran is the Capital
*Large cities have a population of more than 250,000 people,
*Medium large cities have a population of between 100,000 and 250,000 people,
*Medium small cities have a population of between 25,000 and 100,000 people,
*Small cities have a population of between 5,000 and 25,000 people.

Source: The First Development Programme of The Islamic Republic of Iran (1362-1366), 1983/84 to 1988/89. Plan and Budget Organisation, vol 3 Infra-structure section, 1982.

In the aftermath of the 1979 revolution, due to a different emphasis of the distribution of services between different sections of the population, a number of comprehensive plans were revised with both positive and negative results. With the

reorganisation of general and physical planning in the post-1979 era, it was hoped that a more effective system of planning of physical development would evolve. Based on this premise the publication of "Urban Planning In Iran" by the MHUD in 1982, gave a new definition to physical planning, thus;

> "the goal of physical planning is the determination of location, dimension and different spaces for the activities of mankind, including; housing, employment, recreation after work hours, etc within the socio-economic policy framework"

Therefore, according to the new definition, a physical plan determines the method of land use and specific tasks in the long-term. Physical planning is seen to shape aspects of the social and physical planning based on the physical relationship of the space. Physical planning is carried out at the National, Regional and City level. (For deatailes of planning methodology refer to Appendix 8)

National Physical Planning is seen as a programme for development based on predetermined long term goals. Medium term plans are prepared on the basis of the long term plans and land use planning objectives. A physical plan, according to the definition of the MHUD is;

> "a combination of goals, policies, and development plans in the form of projects with spatial dimensions, locations and time which have been proposed in physical planning principles" (MHUD, 1982, p6)

The previous discussions on the nature of physical planning in Iran, especially since 1979, provided a good basis for further examination of the city planning process. The next section identifies the different agencies involved and their role in physical planning in Iran.

3:6.1 Public Sector Planning Organisations

The Ministry of Plan and Budget is by necessity the most important organisation involved in the physical planning process as it is responsible for the preparation and implementa-

tion of the development plans and overall development goals and strategies. Other organisations at the national level include the High Council of City Planning, the Ministry of Housing and Urban Development (MHUD), the Ministry of Reconstruction Crusade which is more involved in rural development, the Ministry of the Interior, the Urban Land Organisation (ULO), the Housing Foundation, and various Development Corporations. At the regional and city level, Provincial High Councils, City Councils, and Municipalities are involved. Diagram 3.6 represents the organisation of the physical planning system in Iran.

3:6.2.1 The Ministry of Housing and Urban Development (M.H.U.D)

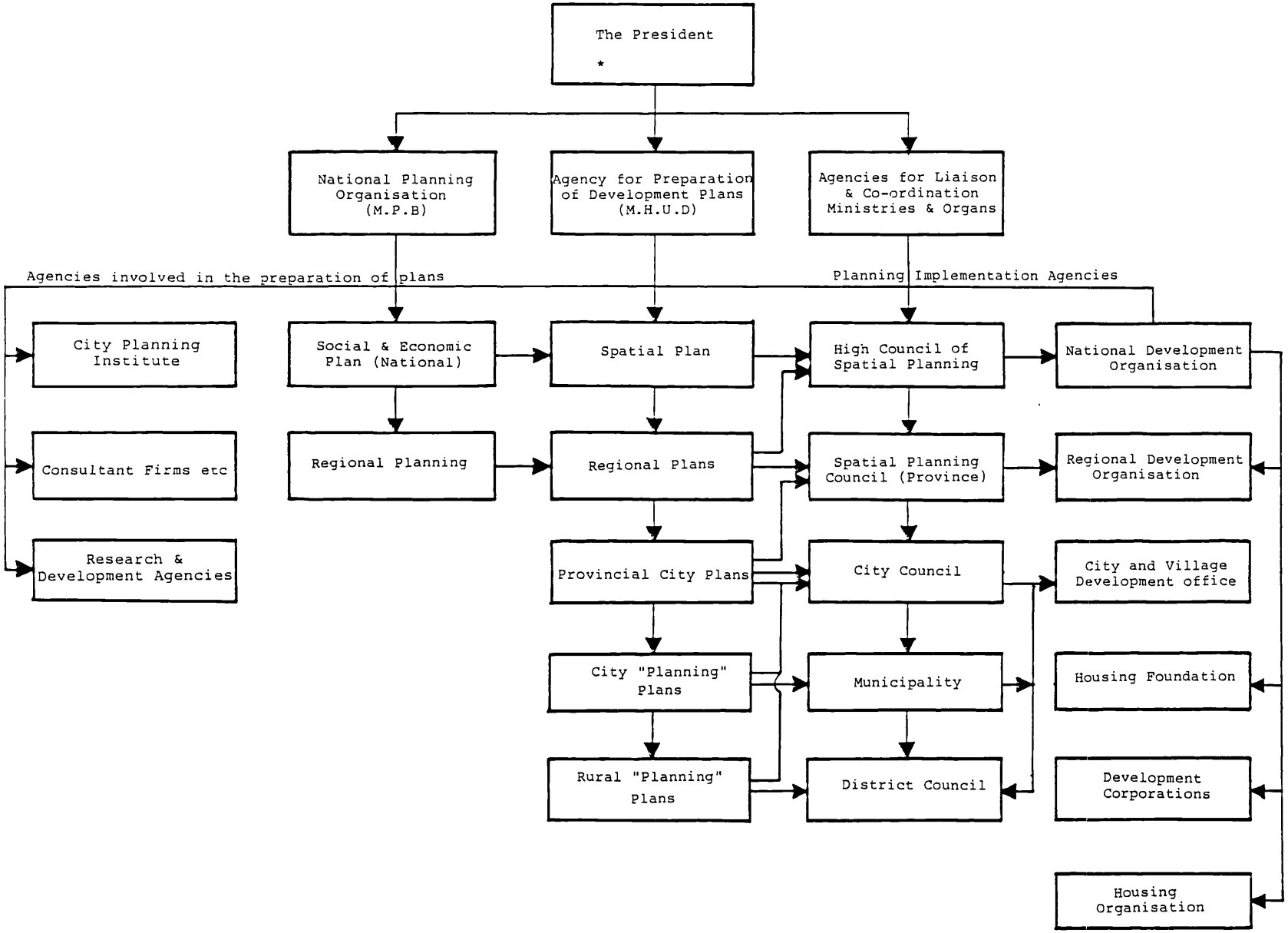
The Ministry of Housing and Urban Development (M.H.U.D) was set up in 1964 to "implement and design" housing projects, cooperate with municipalities in designing and implementing development projects and establish economical standards for housing (Government of Iran 1965). The present MHUD is engaged as a key sectoral agency in the promotion of construction investment of various kinds including government buildings (excepting defence projects), housing for government workers, the provision of urban services for medium and small cities, and the building of second and third degree roads. The ministry is also actively engaged in the encouragement of the private sector to participate in low-cost housing projects, with the setting-up of a Land Bank (in the 1970s) whose task was to purchase land, at a time of heavy speculation (IBRD 1974) and rapid escalation of land values, for the furtherance of such projects. The ministry did not meet with much success in this endeavour.

Since 1986 however, the government has passed new regulations for formulating a new set of policies with the hope of involving private construction companies in the low-cost housing schemes in cooperation with specialist banks. With the help of the Urban Land Organisation, the M.H.U.D has been charged with overseeing and implementing this policy with some success. A more detailed account of this scheme will be provided in chapters Four and Six.

One of the main tasks of the M.H.U.D is to act as a co-ordinating body for consultancy and research including the

Diagram 3.6. ORAGNISATION OF PHYSICAL PLANNING SYSTEM

Preliminary Plan of Organisation and Methodology of National Development Planning



* This post was held by the Prime Minister prior to changes in the Constitution in July 1989.

appointment of consultant groups for drawing up Master Plans (1960s) or Comprehensive Development Plans for cities (1970s). For example, in 1973, the ministry gained a new lease of life when it was given power to launch a long-term national territorial scheme concerning resource mobilisation (Afshar N, 1981) for the development of the infrastructure system on a geographical basis. Other activities include an active research organisation called "Building and Housing Research Centre (BHRC)" and the co-ordination of reconstruction programmes in disaster areas.

3:6.2.2 The High Council for City Planning

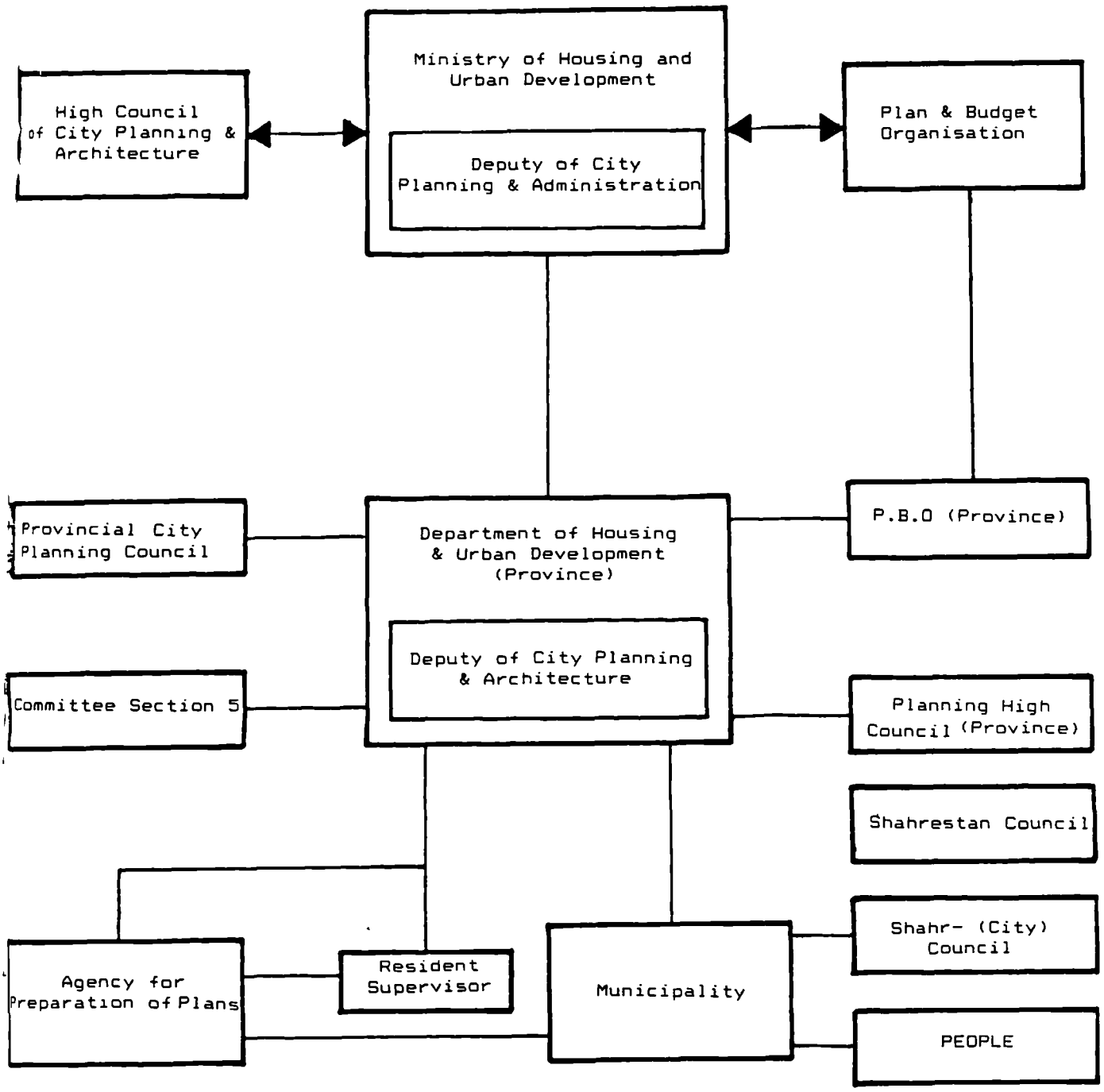
A body called the 'High Council for City Planning' at the national level (Bolourian 1975) and Ostandar Office (Governer of the Province) at the regional level was established to resolve conflicting interests of the P.O and M.H.D. The high council set up in 1964 had the task of producing a general urbanisation policy and coordinating the urban activities of government organisations (Government of Iran 1968). The council consisted of eleven members, including the seven ministers of Iran's cabinet most concerned with urban affairs (Diagram 3.7).

The Ministries of Energy and the Department of Post and Telephone and Telegraph (Telecommunication) were, through their departments at the city level, involved in the implementation of development projects. The involvement of various ministries within the High Council was a positive move as, for example, the inclusion of the Interior Ministry provided a horizontal linkage with the key administrative agency.

The Minister of Economics and Finance provided the vital financial perspective, and the presence of the Ministers of Roads and Energy and Health was also an essential contribution providing a measure of corporate planning. A large number of government departments are present in Iranian cities (Ghaffarzadeh 1981) in order to deal with the issues arising from the implementation of manufacturing, mining, industry and agriculture.

The next section examines the roles of three localities of administration, the municipality at the lowest level, the city councils and the provincial governor.

Diagram 3.7. Hierarchy of Planning Administration (Transition Process)



3:5.2.3 Municipalities

The municipalities are theoretically a hybrid of the government administration and the population. The municipalities are responsible to the Ministry of the Interior and its Technical Bureau (Vatani 1986). Prior to 1979 these agencies supervised the work of municipalities and authorized their expenditures. Since 1979, however, the municipalities have been given a degree of autonomy. According to the law they have a wide variety of duties ranging from the building of streets, squares and parks to the provision of 'water and electricity', and the maintenance of the sewage system. Other duties include the implementation of the city council's decisions on price control of commodities, the implementation of city plans, and control over retailing activities by issuing planning permission (retailing permits) (Kamangar 1985).

The duties of municipalities cover most urban and economic and social activities. Prior to 1979 municipalities were amongst the poorest, most corrupt and least efficient (PBO 1960) of government departments. However, since 1979 they have been made self financed apart from grants for large scale investment on development schemes. Their income is from the local rates on land, businesses and through the generation of income from road tax on cars, airports, railways and road tariffs on passengers.

In fact, most municipalities are at present engaged in real estate development, the purchase and resale of land and property. This has caused much criticism by some residents who argue that, such practices by the Municipality itself induces property speculation rather than curtailing rapid growth of the city. Such remarks can be frequently heard on the daily phone in programmes of the local radio station. The municipalities have the power to issue planning permission for the construction of any building, residential or commercial, and charging a fee for this purpose. Their control over the issue of the planning and retailing permits within the city boundary is quite effective but they fail to have any effective control over the construction process concerning the use of materials or methods of construction, and building codes (Diagrams 3.8 and 3.9). Their control is in the form of ad hoc and unannounced visits made to the site by mobile patrols, who can put a stop to illegal building and unsafe methods of construction.

Diagram 3.8: The translation of the Building Permit for Mashhad Municipality

BUILDING PERMIT

Islamic Republic of Iran

Mashhad Municipality, Ward .....

Date of Approval.....
Ref No.....
Date of Application.....
Identification No.....

Applicant Male ..... Reply to Application of..... Building Permit for.....
Female.....

Land:
——————— Plot No 3, Block 5 of the | Ownership Certificate | No..... Located in.....
Planning subject

with the area of 347 sqm based on the Comprehensive Plans in Ward 1, Density: Medium Residential that according to Planning Regulations, hereby permission will be granted to commence building operations on the above land with the conditions outlined below;

a.1. North 9.1 m towards the Ferdowsi Boulevard, 2. South 9.0 m to 16th Avenue
3. East 37.8 m adjacent to plot No.4, 3. West 39.7 m with Plot No.2

b. to be constructed according to the detailed plans submitted with the Planning Application and under the supervision of Architect or Building Engineer..... provided the following conditions are met.

1. The following specifications for the separation of different levels (floors): The dwelling to be constructed with due respect to the location of the Bus Stop at a distance of 4 m. Nothing should be built in the front yard. The height of the basement ceiling in relation to the street level should not exceed 1.00 m. The building should be used solely for residential purpose in the form of two separate units. The owner is not permitted to carry out further sub-division or to allocate any parts of the building for commercial use.

   The directive No: 65/11/18 - 4/34007 of the Urban Land Organisation is also attached to the file. The conditions on the reverse side of the certificate should be complied with.

   The right of entrance to the car park is from the South Side of the Plot and not the Northern Side.

   The built floor area of the first floor unit is 171 sqm. The built floor area of the basement and storage area is 81 sqm together with an additional area of 90 sqm totalling 171 sqm. The second floor unit is of an area of 90 sqm.

2. the total built up area including the basement, car park and ancillary yard is 423 sqm.

3. The minimum parking area will be 25 sqm.

4. The perimeter wall should respect the road alignment to the North and South.

* The building operation should commence with the authorisation of the Building Inspector from the local Municipality and upon the completion of the building, a Completion Certificate should be obtained.

* The validity of this Building Permit is one year after the date of issue.

* The approved plans and the aerial plan which specify the location of the plot should be retained by the Municipality until the date of completion.

* Compliance with the conditions set out in this permit is legally binding (prerequisite).

Municipality Ward No..

Local Mayor (sign and date)	Issuing Officer	Plan & Programme Coordinator
.....	.....	.....

CONDITIONS:

1. The use of pitched roof covered with galvanised steel is strictly forbidden.

2. All rain water drainage pipes should be installed internally and reach garound level.

3. This permit and its contents should not be considered as an ownership certificate and in the case of the land or the building in question being rented out prior to the submission of application, does not constitute the right to evict any person/s.

4. The building should be built according to the design on the plan, and conditions of this permit with good quality materials. If the conditions set out in this permit are not complied with, the Municipality will prevent further building operation and will act according to Section 100 of the Municipality Law.

5. All building materials and spoils or any other rubbish should not be left on the pavement or the road under any circumstances, otherwise the Municipality can stop the building work.

6. During excavation, necessary precautions should be taken in order to safeguard existing water, electricity, gas and telephone mains and the safety of any adjacent buildings. In case of any damage, the owner is responsible.

7. If after the validation date, the building operation has not commenced, the owner should renew the Permit.

8. The building facade of the building should be built with good quality materials and safe methods of construction in order to ensure the safety of the passers-by. During the building operations of tall buildings scaffolding should be used for the safety of the workers.

9. The facing materials of the walls on the main roads and adjacent buildings should be of good quality and appearance.

10. When the excavation is in excess of 60cm the owner should, with the knowledge of the Municipality, construct a wall in order to ensure the safety of the public. The wall should be removed on the completion of the building.

11. In the event of accidents occurring as the result of change in climatic conditions and water bursts, if the foundation of the building has not been carried out properly, in the case of any damage the Water Board will not be held responsible.

12. All services, including water, electricity, gas and telephone should be installed according to the specifications of the relevant authority.

Registration of the Receipt of any Building Materials or Goods:

جمهوری اسلامی ایران

بسمه تعالی

تاریخ صدور ۶۷/۷/۲۸

شماره ۱۷۱۴۳۹۲

تاریخ ۶۷/۵/۲۲

شماره شناسائی ۳ ۵۱ ۹۱۶۴

پروانه ساختمان

شهرداری شهد منطقه یک

توماج

آقای / خانم عبدالعزیز فرهادی پاسخ درخواست مورخ ... موضوع تقاضای پروانه ساختمان

در پلاک ثبتی / در قطعه زمین شماره ۳ بلوک ۵ فرعی مورد سند / اعیان عرصه ۹۰۰۱۰۴ واقع در شهرجدید طرح الف

بمساحت عرصه از ۴ اصلی بخش ۹ مشهد ۲۴۷/۲۶ مترمربع براساس طرحهای تفصیلی درمنطقه یک تراکم متوسط مسکونی

وباستناد ضوابط تعیین‌شده اجازه داده میشود در ملك فوق‌الذکر با مشخصات وشرایط ذیل احداث بنا گردد.

الف : ۱ـ شمالاً بطول ۹/۲۳ متر به بلوار ۴۰ متری ۲ ـ جنوباً بطول ۹ متر متر به خیابان ۱۶ متر

۳ـ شرقاً ۳۷/۸۰ متر به قطعه ۴ ـ غرباً ۳۹/۶۷ متر به قطعه ۲

ب : ساختمان برابر نقشه‌های ممهور شده پیوست وبانظارت مهندس رضا سپهرمنش وبا شرایط زیر مجاز میباشد.

۱ ـ مشخصات زیر بنا بطور تفکیك در طبقات :

سطح زیربنای زیرزمین انباری ۲۰۸ مترمربع سطح زیربنای همکف مسکونی ۲۰۸ مترمربع . سطح زیربنای پیلوت ۸۷ مترمربع . سطح زیربنای طبقه اول مسکونی ۲۰۸ مترمربع . سطح زیربنای طبقه دوم مسکونی ۸۷ مترمربع . ساختمان میشود بصورت دو واحد مسکونی درضلع شمال زمین بارعایت ایستگاه اتوبوس وجهازمتر عقب‌نشینی بصورت حیاط خلوت که حق احداث بنا درخلوت واحداشغاله وتفکیك عرصه راندارد . ارتفاع زیرزمین تازیرسقف نسبت‌بکف پیاده رو ازیکمترو پیلوت حداکثراز ۲/۴۰ تجاوزننماید . حق ورود ی پارکینگ از بلوار شمالی راندارد و بایستی ازخیابان ۱۶ متری جنوبی باشد . تذکرتحویل هرنوع مصالح ساختمانی توسط کمیته توزیع مصالح ساختمانی توسط کمیته توزیع مصالح ساختمانی و صدور هرگونه مجوز اعم از عدم تخلف استحکام بانك ـ پایاندار وغیره بوسیله شهرداری منوط به تکمیل فرم مرحله‌ای ارائه‌شده و ضمیمه پرونده میباشد . قبلا دارای پروانه شماره ۱/۲۸۴۵۰ ـ ۶۶/۳/۱ بوده که از درجه اعتبار ساقط است شرایط پشت پروانه رعایت شود . حد وسعت پلاك زمین طبق پلان ضمیمه که توسط مهندس ناظر

۲ـ سطح کل بنا با احتساب زیر زمینی و پارکینك و پیلوت ۶۲۴ مترمربع .

۳ ـ حداقل مساحت پارکینك مورد لزوم ۲۵ مترمربع ۴ـ عقب‌نشینی جانبی ازپلاکهای مجاور ... متر

۵ ـ عقب‌نشینی نسبت به‌عرض گذر بعد ازطبقه ... بمقدار ... متر ۶ـ نوع استفاده‌ازساختمان ...

ج : دیوارکشی پلاك فوق با رعایت عرض خیابان بلوارفردوسی و ۱۶ متری و رعایت پخی‌سر نبش ... متر انجام گردد .

د : شروع و رگ اول بنا باید با تایید کارشناس نقشه‌برداری شهرداری انجام پذیرد وپس از خاتمه ساختمان اخذ گواهی پایان کار الزامی است .

ه : مدت اعتبار این پروانه از تاریخ صدور یکسال میباشد .

و : نقشه تاییدشده وهمچنین نقشه هوائی که موقعیت زمین درآن مشخص است بایستی تاپایان ساختمان درمحل موجود باشد

ز : رعایت مفاد مندرج درظهر این پروانه الزامی است .

مسئول طرح و برنامه ـ رفائی

مسئول ضدور پروانه ـ عاملی

شهرداری منطقه یک

۱ ـ احداث سقف شیروانی با پوشش فلزی اکیداً ممنوع است مگر با پوشش (آس‌بست وامثالهم) وخرپای فلزی
۲ـ نصب ناودانها بایستی عمودی تا سطح زمین و داخل کارباشد نصب هرگونه ناودانی وآبرودرحاشیه خیابانها وکوچه‌ها اکیداً ممنوع است .
۳ـ این پروانه ومنضمات آن بهیچوجه مدارك مالکیت نبوده‌و در صورتیکه محل مورد تقاضا قبل از ساختمان در اجاره باشد ملاك تخلیه ملك از مستاجر آن نخواهد بود .
٤ـ ساختمان بایستی برابر نقشه‌وضوابط پروانه اخذشده ومصالح مرغوب احداث گردد چنانچه برخلاف مفاد پروانه‌عمل گردد شهرداری ازادامه‌کار جلوگیری وبرابر ماده ۱۰۰ قانون‌شهرداری وتبصره‌های الحاقی عمل خواهد شد .
٥ـ مصالح ساختمانی وهمچنین مازاد خاك ومصالح‌بهیچوجه‌نبایستی‌اعم ازپیاده‌رو وسواره‌رو ریخته شوددرغیراینصورت شهرداری میتواند از ادامه ساختمان جلوگیری نماید
٦ـ درگود برداری ساختمان باید رعایت شبکه‌های برق وآب‌وگازوتلفن بعمل‌آید ومیبایست مسایل ایمنی املاك‌مجاورکاملا رعایت گردد چنانچه خساراتی به شبکه‌های مذکور و املاك‌مجاور وارد گردد مالك ساختمان عهده‌دار خسارت واردة خواهد بود و درصورتیکه برای عبورشبکه‌های فوق‌به‌اسفالت‌شکافی نیاز باشد باید قبلا از شهرداری کسب مجوز شود .
۷ـ چنانچه پس از اتمام مهلت پروانه ساختمان عملیات ساختمانی شروع نشودمالك موظف است پروانه صادره راتمدید نماید درغیراینصورت پروانه فاقد اعتبار خواهد بود .
۸ـ روکار ساختمان باید ازمصالح مرغوب وبنحو مطمئن بناشود وبرای حفظ جان عابران و کارگران هنگام نماسازی ساختمانهای بلند باید داربست آهنی ودرساختمانهای‌معمولی‌حداقل چوب‌بست که در داخل بشکه‌های پر ازشن و محکم قرارگیرد استفاده شود .
۹ـ روکار ساختمان و دیوارکشی باید درجبهه‌گذر یا حیاط‌خلوت و مجاور با همسایه از مصالح مرغوب وبنحو مطمئن وبطرز زیبائی احداث شود .
۱۰ـ هرگاه اجراء عملیات ساختمانی در حاشیه معبرمستلزم‌خاکبرداری بیش از ٦۰ سانتیمتر باشد مالك موظف است با اطلاع شهرداری مسئولیت فنی مربوطه دیوار موقت ومناسب‌جهت جلوگیری ازریزش وسقوط عابرین وحفظ ایمنی‌احداث نماید وپس از اجراء و رفع خطر بلافاصله دیوار مزبور رابردارند .
۱۱ـ در مواقع بروز حوادث ناشی از تغییرات جوی‌وترکیدن‌اوله‌های آب چنانچه پی (فونداسیون) ساختمان اساسی ساخته نشده باشد و ساختمان نشست نماید سازمان آب‌هیچگونه مسئولیتی نخواهد داشت .
۱۲ـ ایجاد تاسیسات آب وبرق وتلفن وگاز درساختمان‌بایدبطریقی ایجاد شود که مورد تایید ادارات ذیربط قرارگیرد .

محل ثبت مصالح و کالای دریافتی :

In the past their control over the city affairs even extended to forcing the owners of property in the main streets and avenues to paint the exterior of their buildings in a particular colour specified by the municipality. As urbanisation has increased and the city boundaries expand beyond their control they have adopted almost an attitude of letting unauthorised development take place and then imposing heavy penalties on the owners and thus generating more income.

At present the municipalities do not have any realistic ability to tackle the uncontrolled growth of the urban areas, this belief was particularly enforced when interviewing the Mayor of one of the ten districts that comprise the city of Mashhad. He stated:

> " today we are walking one step behind the residents of our cities. It seems that all our effort is to deal with problems when they happen, rather than having any clear cut policies to meet the demand of a growing twentieth century city of a few millions".

He further added that;

> "it seems that contrary to what should take place, we wait for the people to determine the growth of the city; we only take the services to areas already developed outside the city boudary".

In his opinion proper city planning should predetermine where city growth should take place. Once decisions are taken, then the municipality should provide all the services required by its citizens to the sites and only on the completion of this stage should permission for further building activities be granted. It will take a long time before the municipalities in Iran can achieve this level of sophistication. The inability of municipalities in tackling urban sprawl is mainly due to the lack of sufficient technical and administrative expertise (MHUD 1982). Municipalities are of paramount importance in understanding urban affairs (Ghaffarzadeh 1981) in Iran since, apart from their extensive responsibilities, they provide the only formal link between the population and the government at the urban level.

This important link was evident during the various visits to different Mashhad municipalities, where it was noticed that,

the population had direct access to the Mayor. On a regular twice daily basis the Mayor was available to receive people. During these short meetings he would hear people's complaints and if possible refer them to the relevant sections for the clarification of their problems. This demonstartes the importance of the municipalities in the development and management of urban areas in Iran.

3:6.2.4 Other Planning Organisations at Local Level

There are councils both at the Ostan (province) and Shahrestan (city) levels. With the exception of certain cases, such as resolving conflicts between Ostandar (the Governor) and city councils, there is, in theory, no hierarchy of councils, but in practice the city council has emerged as the most important consultative body while the other two have become unimportant extensions to the government administration (Ghaffarzadeh 1981). Prior to 1979 the Governor General of each province was appointed by the Shah, but since 1979 the selection and appointment is done by the Minister of the Interior with the agreement of the Prime Minister. In 1973 the planning bureaux in major provinces were strenthened and renamed Provincial Planning Bureaux. The director of each planning bureau was appointed by the P.B.O. (now M.P.B) but with the official title of Deputy Governor General for Planning and attached to the Governor General's office.

Elected Provincial Councils have been operating since 1969 with duties such as education, roads and irrigation projects) and the provision of housing. The council can also act in an advisory capacity with respect to urban development. Representatives of the provincial council form part of the membership of a policy making body at the provincial level called the Plan and Budget Committee, chaired by the Governor General. This process provides a formal administrative network for the transmission of planning decisions and an operational linkage between the two hierarchies in the form of working committees with a representational element in the form of the provincial councils (Bolourian 1975).

At the city level (shahrestan) city councils appoint and dismiss the Mayor, supervise the finance and administration of the municipalities and implement the city plan. The city councils are accountable to the Ministry of the Interior and

they can be dismissed by the Cabinet. The members of the city council are elected, but in reality they are vetted by the government. The city councils have become more involved in the process of decision making as the result of political changes since 1979, however, there is a lack of technical agencies. The authority and responsibility of the city councils derive either from the instructions issued downwards from Governors or from the electoral mandate from below. The implementation of planning goals, therefore, depends on effective co-ordination between the political and technical hierarchies at the provincial level and the effective transmission of planning decisions through the political hierarchy to city councils and their officials (Afshar N, 1981).

During various visits to the local branches of the Plan and Budget Organisation, the Department of Housing and Urban Development (DHUD) the Municipality and other government departments a number of officials wer interviewed. The questions mainly concentrated on the range of their responibilities and the role of their departments in the urban planning and construction process. In response to the question regarding the co-ordination between the DHUD and Plan and Budget Organisation, he remarked:

> "There is no co-ordination between our department and the Plan and Budget organisation in the province at all. In my opinion there is no planning let alone coordination."

The same question was put to the Deputy Director of Plan and Budget Organisation in Mashhad. Whilst feeling upset of what he heard of the opinion of his colleagues in the DPUD, he mentioned with some justification thus:

> "There is regular meeting with all the departments concerned with urban affairs including the DPUD, the Muinicipality, the Governer's Office, the local Water and Energy authorities etc, when they discuss various proposals, and new plans and difficulties with implementation."

His views were confirmed by various officials in the Municipality and other departments that were visited. The author was also allowed to attened (as an observer) a number of weekly meetings between the heads of various departments at the Plan and Budget Organisation offices in Mashhad, during

which on a routin basis important proposals and latest government directives were being discussed. However, the ill feelings of the people in the DPUD to some extent demonstrates the degree of dissatisfaction by many of the frustrated personnel who can see their plans and proposals being shelved as the result of competition between various government departments or the general disinvestment in urban development.

It was mentioned earlier that there are various semi-public agencies which are also involved in urban or rural development in various parts of the country. One of these particularly powerful agencies in Mashhad is Astan-e-Ghods- Razavi (Razavi Foundation) whose functions are rather similar to the Church of England Commission. The latter is the largest landowner in Mashhad and one of the richest organisations in Iran whose income rival and surpasses some of the government ministries. Because of its influence and large excess capital and land holding the foundation is heavily involved in property development not only in Mashhad but also in other areas of Iran.

In the interviews with officials in various local departments it was aparent that the foundation does not adhere to any existing planning practices and the City Master Plan. In fact one of the officials in the Mashhad Municipality mentioned:

> "As far as they (Razavi Foundation) are concerned, the Master Plan for Mashhad does not exist. As they own the land they can go ahead with development outside the city boundary. By the construction of a new motorway or road linking the proposed settlement to the city they create a demand for new housing and plan the settlements according to their own standards".

This kind of activity has undoubtedly created much tension between the city authorities and Razavi Foundation. Such disunity and lack of coordination of activities causes overlap of works and wastage of valuable manpower and resources.

This concludes the examination of the economic development and physical planning processes in Iran both prior and after 1979 albeit a descriptive account. This is due to the fact that the recent publications on the Iranian planning system (post-1979) are very limited. This chapter is based as much as possible on

personal observations and when possible supported by the available official and unofficial publications and other related articles and books by Iranian and western scholars. It was mentioned earlier that this part of the thesis was designed to provide an overview of the planning process. It was also proposed that Chapter Three should complement Chapter Four, i.e the process of construction in Iran. Before embar- king on the examination of the construction process it is necessary to provide a conclusion to the wide ranging issues covered in this chapter.

3:7 CONCLUSION

The review has traced national development planning in Iran from its beginning in the 1940s, first with the setting up of a sophisticated planning administrative hierarchy and then the implementation of various five year plans, both prior to 1979 and during the decade since the social revolution of the same year. It has portrayed an economy based on oil revenue, with an urge for modernism, self sufficiency , industrialisation and prosperity.

Shortages of skilled manpower and a long and damaging war have bedevilled the implementation of development plans both before and after 1979. Apart from catastrophic human consequences the war has caused damage to both the economic and physical bases of the nation.

The physical infrastructure of the country is in desperate need of desperate repair and a new injection of investment. The problem of urbanisation which has affected other countries in the developing world has at last caught up with Iran at a particularly bad time. The deterioration of the rural areas during the revolution was as the result of war and the introduction of hurried and ill considered policies regarding the distribution of land to low income groups.

Through the examination of the physical planning process in Iran it has become apparent that throughout the 1970s ambitious plans were devised to expand the urban areas with relative neglect of the rural areas. The physical planning process seems to have followed the pattern of planning principles either designed by foreign consultants or western educated personnel. At the same time it should be concluded that town planning in the form of British town planning system does not really exist in Iran as such, and planning has not been fully developed as a separate profession similar to the planners in Britain. The pattern that has emerged may owe more to the Italian practice, a legacy from Italian consultants operating in Iran over the last three decades.

As in continental Europe, planning is administered by archi-

tects rather than planning professionals. Thus, due to its antecedents and the nature of the personnel who administer it, the planning machine in Iran has had a distinctively different evolution form to British practice. Iranian city planning, even in the 1980s, is mainly based upon comprehensive master plans and civil engineering and building contracts. This in turn dictates the financing and technology. The nearest Britain got to such approaches were the New Towns.

However, it is important to note that since most planning is carried out by Iranian personnel, the current practice may produce a more positive plan based on cultural and national identities. In fact, signs of improvement can already be felt in the way that the Ministry of Housing and Urban Development is encouraging research into the ways of conserving the existing city centres rather than the previous approach which was based upon large scale destruction and redevelopment of many Iranian cities, producing wide streets based on a grid pattern. A ray of hope is present here. It may be that in this more adaptive approach opportunities exist for a greater diversity of more sensitive construction technologies.

From a legeslative point of view it can be seen that a tendency towards a more autonomous distribution of administrative power at local levels has occurred since 1979. The evidence shows that municipalities have a long history of importance at city levels despite the fact that they lack sufficient trained personnel, in addition to which they provide the only formal link between the population and the government at the urban level.

The decade since 1979 has been apocalyptic. Amidst revolution, Islamic fundamentalism, appalling war and national sacrifice, the elaborate re-casting of national development planning would seem a luxurious diversion. It is a measure of the resilience of Iran and the depth of the nation's resources that such an elaborate development planning structure was drawn up at the height of the war.

However, the application of the process has been subject to heavy handed emergency action. While this might be explained by the war economy, nevertheless the process laid down did not seem sufficiently responsive to economic functions and opportunities. In general terms, therefore, it could be deduced that; planning in Iran is of a centralised nature with a

slight tendency towards regional planning and too rigid to allow for much flexibility. If the situation of both rural and urban areas are to be improved then it is imperative that development planning contains a high degree of regional emphasis.

An inference might be drawn in relation to to construction. From the way in which the state has been keen to retain a dirigist control over the nation's development. This has been shown to be as true of the pre- 1979 period as of the past decade. One might conclude from this that the Iranian construction industry is likely to be frustratingly fettered by government policy. Is the construction industry beholden to the government as the principal patron? Is the industry constrained financially within government economic policy? Is free market access to key construction materials causing a black market to operate? Is the stronghold that professionals such as Architects maintain working for government, dictating the technology that the industry adopts? These questions might be resolved in the following chapters.

In the next chapter the study will provide a brief sketch of the form of both rural and urban construction in Iran in order to help with the understanding of the link between planning and construction in the Iranian context.

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CHAPTER 4

4:1 Introduction

This chapter focuses on:

The strategic role of the construction industry in overall national development;

The impact of planning policies on the construction industry; and

The political and institutional factors affecting the construction process.

Firstly the chapter deals with the general situation of construction, its process and the framework within which it operates. Secondly it reviews the processes of urban and rural construction. Thirdly it concentrates on each of the preceeding contexts in order to provide an insight into the degree of sophistication, resource production and distribution, and dependence on foreign technology. An account of the result of planning policies as outlined in the previous chapter and their impact on the construction industry is also presented.

The examination of the construction industry and the process in Iran is necessary for the further expansion of the hypotheses that:

1) The choice of construction technology and resources is determined by economic and physical planning policies.

2) National Development planning and Physical Planning strategies have a direct impact on the performance of the construction industry.

4:2 The Construction Industry in the National Context

The construction industry is the sum of its disparate parts. They include contractor companies, material producers and distributors, design and other professionals, and personnel who use their skills, labour, finance, tools and equipment to procure, combine and assemble a variety of material and components to produce:

I) Facilities, such as buildings, to shelter a wide range of social and economic activities and functions;

II) Plant and process facilities to provide productive capacity for various industries;

III) Infrastructure systems for transportation, communications and water and power supply.

In his report for Habitat, Fred Moavenzadeh (1984) argues that:

> "these facilities are an integral and highly visible part of the socio-economic development of a country. Though policies for improving the capacity of the construction industry in developing countries should take into account the needs of the users, they rarely do". (p20)

The important role of the construction sector in the economic development in Iran since the 1950s is characterised by its almost 5 per cent contribution to the GNP at factor cost (1967), and by the annual average growth of about 9 per cent from 1959 to 1966 (Spillane 1974, p68). The construction activities during the First Plan included the development of transport and communication networks, and the construction of a number of factories. During the Second Plan however, the construction sector took a more prominent role in the economy through number of projects, including the construction of three large dams (amongst them, Karaj) and the expansion of roads and railroads. Against the target of 10,700 km of roads, only 5,503 km were constructed: the rail network was extended to Tabriz and from Tehran to Mashhad (Mofid 1987, p45). As Iran entered a period of economic chaos, the loss of confidence in the economy resulted in speculation in land, real estate and construction. Private sector investment in construction was not in the form of capital formation, but in speculative investment.

The period of the Third Plan boosted direct government expenditure and led to a major economic boom particularly manifest in the form of urban housing construction. The construction growth was on average 12.0 per cent per annum with major projects including the completion of three large dams on Sefid Rud, Zayandeh Rud and Aras Rivers. Other significant projects

included the construction of Iran's first steel mill at Isfahan and a number of industrial plants. The construction of major roads was speeded up and absorbed a large share of investment. In general, the construction of prestige giving giving projects was given prominance.

In the 1970s the construction industry already possessed a considerable capacity and degree of sophistication to build even very complex structures. During the Fourth Five-year Plan the average annual growth of construction reached 19 per cent value added (Bank Markazi Iran, 1984). This was achieved by government investment in infrastructure and other social projects especially urban housing, in defence, military bases and rural development. The share of construction in Gross Domestic Fixed Capital Formation (GDFCF) in total was, 63 or 64% each year from 1968 to 1972, with the average annual growth rate of 12.7% (Mofid 1987, pp68-69), (Table 4.1).

It was during the Fifth Development Plan (1973-77), that the construction industry was particularly affected by both economic and physical development strategies. As noted in Chapter Three, the Fifth Plan, revised in the face of the increase in oil prices of 1973, led to a six year construction boom. As part of the industrialisation or "big push" strategy, the construction industry entered a new phase with emphasis on industrialised building production methods, and the initiation of the "crash housing programme" which will be elaborated in Chapter Six. Physical planning strategies included the construction of satellite towns and new towns to absorb future migrants from the countryside. This reflected the influence of architect-planners and the international trend in urban development in the 1970s.

The Revised Fifth Plan included a 177% increase in investment in housing and allocations for rural and urban development of 73 and 47% respectively (PBO, 1975). The substantial demand placed on the construction sector in the form of increased investment in both military and civilian projects caused severe shortages of building materials and a rapid increase in their price which by 1974 amounted to an increase of 22.1%, thus reflecting serious inflationary pressures. A more detailed analysis of the impact of planning policies on the construction industry is given in the later parts of this chapter.

Table 4.1 Value Added and Capital Formation in construction and the share of each sector in the Gross Domestic Product and Capital Formation between 1965 and 1994.

(fixed price, *1000 million Rials, percentage).

YEAR	VALUE ADDED Construction SECTOR *	percentage share of the Growth Domestic Product %	CAPITAL FORMATION in Construction Sector *	Share of Capital Formation *	Industry & Mine		AGRICULTURE	
					Value Added % of	% of Capital Formatn	% of Value Added	% of Capital Formatn
1965	34.9	3.2	61.1	36.7	6.0	9.8	16.4	6.0
1966	33.4	2.7	64.4	33.3	6.3	10.7	15.5	5.1
1967	39.2	2.9	68.8	32.4	6.5	11.1	15.0	6.7
1968	43.2	2.8	69.1	29.3	6.7	15.4	14.6	6.4
1969	47.4	2.7	75.1	29.5	6.6	17.1	13.1	6.4
1970	56.9	3.0	97.2	34	6.6	17.4	12.2	6.3
1971	63.9	3.0	95.2	28.4	6.2	16.1	10.8	7.6
1972	76.4	3.1	119.6	29.1	6.9	13.4	10.5	8.4
1973	96.7	3.5	132.7	28.6	7.6	15.9	10.2	7.8
1974	110.6	3.6	157.6	29.7	8.0	15.6	9.6	8.7
1975	150.5	4.8	221.1	25.3	9.2	18.1	9.8	6.8
1976	228.9	6.2	309.9	26.2	9.1	14.2	8.9	5.0
1977	179.3	4.8	280.9	25.9	9.6	15.5	8.7	4.3
1978	155.7	4.8	267.6	28.8	10.7	11.2	9.3	4.1
1979	112.8	3.7	235.4	40.9	11.2	10.8	11.6	4.9
1980	120.7	4.7	250.6	45.2	13.7	8.8	14.1	4.4
1981	106.0	4.0	197.1	35.0	14.1	8.6	15.3	6.2
1982	110.7	4.2	217.4	35.1	13.6	9.3	17.3	5.6
1983	133	3.97	—	—	14.3	—	12.6	—

Source: Bank Markazi Iran, 1985.

Iran Statistical Centre.

As with other oil based economies much of the capital for investment came from the proceeds of the export of oil and petroleum related products (Healey et al 1985, pp5-7) especially in the aftermath of the 1973 oil price rises. Under the influence of the world economy by the nature of the state economy (capitalist) patterns of investment followed those of the international markets.

The 1970s witnessed the development of the construction industry and real estate development similar to those of other capitalist economies. The pattern of investment favoured the expansion of the private sector and the groups loyal to the political establishment. Also during this time international construction groups were involved. The process of rapid urban growth also encouraged the construction industry. Healey and Gilbert (1985) note that the method of channelling resources into the construction of urban space by the state (housing, public works programmes etc) is as follows:

> "it may employ state corporations, or it may contract private companies, or it may even employ a mixture of the two".

In Iran each of the three methods were chosen at different times. With government support the private sector construction industry grew rapidly with very large companies involved in all construction related activities in the production distribution of building materials, and real estate. The economic boom of the mid-1970s was reflected in construction by both the state and private individuals. The boom slowed down after 1977 to end at the time of the revolution, with foreign and Iranian contractors abandoning half finished projects (Diagram 4.1 and Diagram 4.2). Since 1979 however, with the ever decreasing source of finance and the increasing demand of the military because of the war, the construction sector suffered most from the cut back in development spending and the austerity programme in the governmental expenditure. The only major exemption was the construction crusade, which received the equivalent of $2.5 bn for projects in the war zone and the development of the rural areas, including irrigation and house building schemes. The general improvement in economic conditions left construction in a continuing recession with starts down by 21 per cent in 1981/82 and 24% in 1982/83 (E.I.U 1987). As a means of improving a rapidly deteriorating housing situation, the government gave the state rights to complete

Diagram 4.1: Capital Formation in Construction as defined by Government and Private Sector Contribution at Constant Prices between 1965-1983.

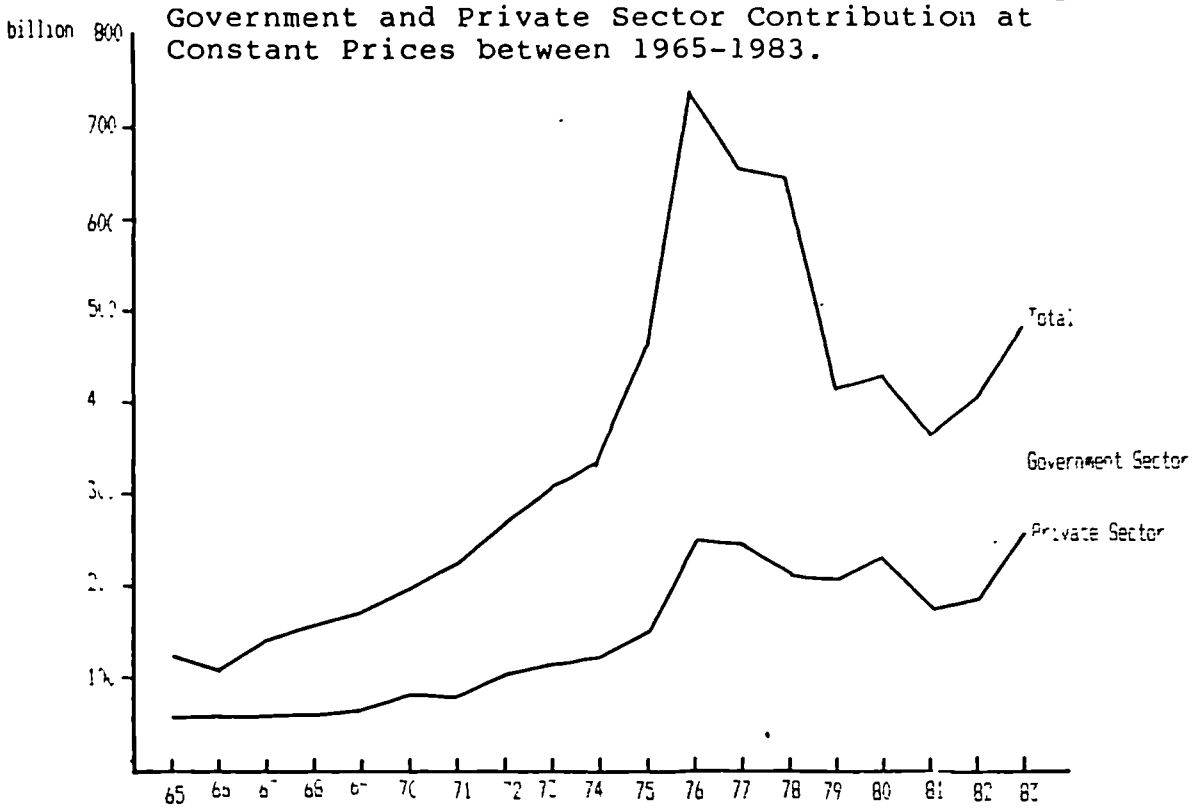


Diagram 4.2: Share of construction in Gross National Product and of Gross Constant Capital Formation between 1965-1983.



Source: Central Bank of Iran, Office for Economic Accounts, National Accounts of Iran, 1959-1977, Tehran 1981.
----------, Office for Economic Appraisals Economic Statistics, 1973-1977, Tehran 1985. and Iran Statistics Centre, Annual Report, 1983.

any housing scheme abandoned by contractors prior to 1979. State inaugurated construction prior to July 1988 was concerned largely with war needs, although private sector housing has been more buoyant because of pressure from enormously increasing urban populations. This was apparent in a study visit to Iran during March and April 1984, especially in urban housing carried out exclusively by the private sector. Government activity included various development projects in the rural areas (Ghanbari Parsa 1985).

The technological situation of the construction industry at present is one of contrasts. On the one hand sophisticated projects are undertaken by government ministries as they have access to modern equipment and materials. Many war-related projects were carried out under difficult conditions with a degree of ingenuity induced as the result of urgency and the fact that sensitive projects could not be given to foreign companies for security reasons. On the other hand, at the bottom end of the construction process output is of poor quality carried out by small operators who imitate relatively modern building techniques quite often inappropriate for the work involved.

There are numerous problems which inhibit the effective functioning of the industry. These are similar to those of other developing countries and include a lack of skilled personnel and a shortage of building materials and construction equipment. A more detailed analysis of such problems are presented in the next chapter.

4:3 Identification of Major Participants in the Construction Industry

The two major participants in the construction industry are obviously the public and private sectors. In recent years, however, other sectors including para-statal agencies, co-operatives and the informal sector have played an increasingly important role in the construction process. The public or government sector is particularly strong not only in Iran but in most centrally planned economies and other developing countries. The Government sector comprises a number of ministries involved in infrastructure, urban and rural development, and the transport network, the production and distribution of

construction materials, equipment and machinery. Other semi-public organisations include development corporations and banks. One of the most important banks is the Housing Bank (Bank Maskan), although other banks are becoming more involved in financing construction activities (Sakhteman 1989, pp5-11). The banks are publicly owned but are viewed as autonomous financial institutions.

Although the private sector has lost the independence that it enjoyed prior to 1979 it is still very active in the construction sector. In the immediate aftermath of the Revolution many large private construction corporations were nationalised as the result of the flight of their owners. As the war placed priority on war materials and the construction of defence related projects, the government expressed the view that the private sector should take a more active role in the economy particularly in housing. New laws were passed by parliament to facilitate the participation of the private sector in the economy. The following sections will provide more detailed analysis of the role and extent of the involvement of each sector in the construction industry.

4:3.1 The Government Sector

As outlined in Chapter Three, the same ministries and governmental organisations which are involved in the planning process are also engaged in the implementation/construction process. After 1979 many new agencies and ministries were created mongst which are the Ministry of Reconstruction Crusade, in charge of rural development and the Housing Foundation which was established in April 1980 to provide housing for the low income families and to participate in improving the housing situation in rural and war damaged areas (Maskan va Enghelab 1984). The Underprivileged Foundation, (formerly Pahlavi Foundation and mainly a cultural/educational charity organisation) was nationalised and reorganised to look after the property of the people who had left the country during the revolution, or other property and businesses which were confiscated by the revolutionary committees. The Martyr's Foundation was also created to cater for the families of the people who had lost their close relatives in the war. The Foundation is responsible for the housing, education and social welfare of a large number of people. It invests in property development and plant

producing, amongst other products, building materials and components.

The Urban Land Organisation (ULO) was established by the 1981 Urban Land Act to administer the urban virgin land left by those people who had escaped the revolution, or land expropriated by the courts. As part of the MHUD, it is responsible for co-ordinating the process of appropriation, preparation, and allocation of land to low income families for housing. A more detailed account of the work of this organisation is given in Chapter Six (U.L.O 1986).

There are also many other autonomous semi public organisations which are affiliated to government ministries and act as their consultants and contractors in joint ventures with foreign or domestic companies. They are often used in specialist construction operations involved in power generation, water exploration and distribution, gas and oil exploration and distribution etc. Each of these newly created organisations has grown rapidly since its establishment. Many of them are also involved in the production and distribution of construction equipment, machinery and materials, and the import and export of construction related items.

4:3.2 The Private Construction Sector

In examining private sector involvement in the construction sector it is important to consider the overall role and status of the private sector in the Islamic Republic. According to Principle 44 of the Constitution, the economic system consists of three sectors: governmental, cooperative, and private, with systematic and sound planning. In defining the private sector, it refers to:

> "those portions of agriculture, animal husbandry, industry, trade and services which supplement the activities of the government and cooperative sectors."

The same principle in the constitution outlines the limitations to the private sector activities as:

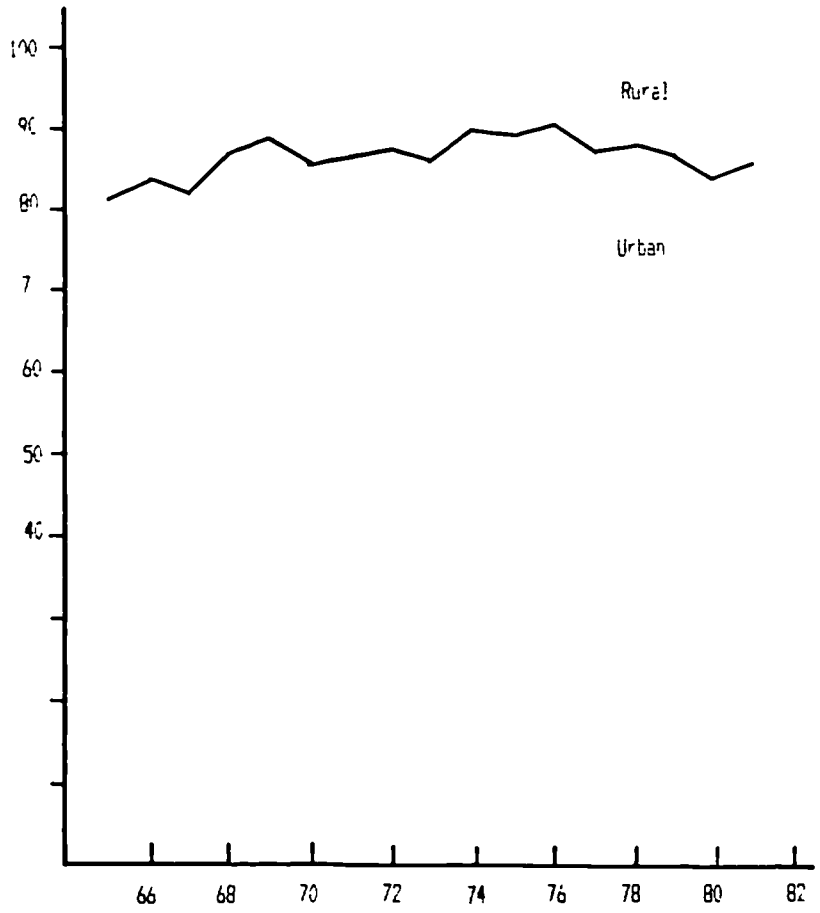
> "no one may, because he is the owner of a particular type of business, deprive others of the opportunity to do the same job.'

The private sector involvement in the economy has gone through a complete cycle and is now back in a position similar to that prior to the revolution. Once "the revolution" was over, the initial settlement of the regime was actually quite smooth (Razavi & Vakil 1984, p107). The public sector became actively involved in social and economic affairs and the private sector began to initiate business at an accelerating rate. However, the smooth operation of the economy was soon halted as a result of the ideological differences within the government. Emphasis on the Islamic way of spending (public) government money, and the action taken by the head of the PBO, Ali Akbar Moinfar, to restrict government expenditure, resulted in the imposition of significant financial constraints on the economy. The resulting outcome of such policies was in the form of the nationalisation of some large industrial companies and some insurance and banking institutions. Further developments included limitations to private ownership, the nationalisation of some companies, and the confiscation of "extra" residential units and non-cultivated lands. This resulted in the private sector's hesitation to invest and its preference to wait in order to find out more about the intentions of the government.

The limited participation of the private sector in the economy has been most profound in the construction industry (Diagram 4.3). At present the private sector is involved in many aspects of construction including contracting, property and real estate development, the production of building components and construction materials and some joint venture activities with the government sector and financial institutions namely banks. During the war years private sector construction activity was in speculative land and property development rather than investment in capital formation and productive sections of the construction sector.

The private construction sector consists of many different types of companies. These include the large corporations operating at the national level and involved in all aspects of the construction industry, and also medium and small companies involved in contracting, consulting, and the production and distribution of building materials, equipment and machinery. At the other end of the scale there are the numerous family and one man operations which represent the informal sector. Although not reflected in official national accounts, it constitutes a significant construction activity. Chapter Five will provide a detailed analysis of the survey findings regarding

Diagram 4.3: The share of urban and rural areas of private sector investment in construction.



Source: Bank Markazi Iran, Comprehensive report of the activities of private sector construction in urban and rural areas, 1983, Tehran 1984.

the operation of private construction companies. This concludes the review of the role of the different actors involved in the construction process; the following section will differentiate between urban and rural construction.

4:4 Urban and Rural Construction

Urban and rural construction has been greatly affected firstly by the drive for modernisation during the reign of Reza Shah, and secondly, (and more significantly), by the planning policies introduced since the early 1950s (Table 3.1 in Chapter Three). In general the development process happens in the following two ways in Iran:

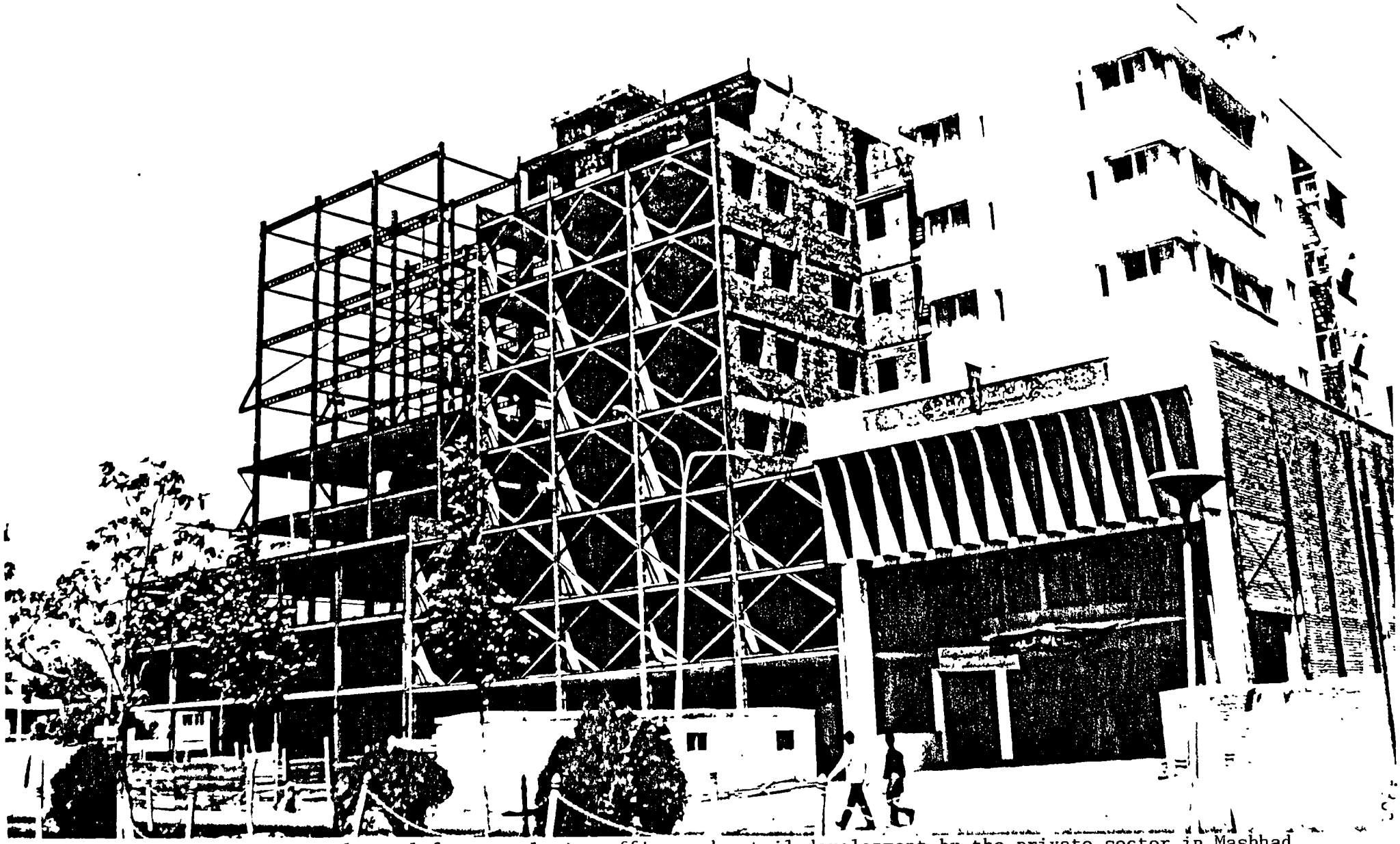
I. development with planning permission and the necessary plans; this occurs mainly in urban areas as noted in Chapter Three.

II. development without planning permission, which occur mainly in rural areas and on the urban periphery not included in the city boundary.

In the major cities the most up to date construction technology and building materials are in use, especially where large scale projects are involved (Chavoshi 1989 ,p77). As most investment in development projects is made by the government, their planning, design and implementation are based on the use of the most modern technology and available resources. The private sector is primarily concerned with investment in small scale speculative projects which require fashionable appearance rather than good quality structural work (Figure 4.1 and 4.2). The majority of houses are built by the private sector, mainly based on small scale speculative or owner-built housing. Institutional housing has been encouraged through a partnership between the banks and the private companies. Although this policy was mainly adopted as a measure of land distribution between low income families in the urban centres, it has proved a valuable method for controlled development in the lower income areas on the periphery of cities (Ghanbari Parsa, et al 1988).

The degree of technology employed in the construction process depends on the type of structure. In larger cities particular-

Fig. 4.1



The use of structural steel for speculative office and retail development by the private sector in Mashhad. The height of the building and the type of finishes are subject to strict planning regulations.

Fig. 4.2



Use of reinforced concrete method of construction by the private sector follows the older public sector development in the background in Tehran.

ly, all types of construction equipment and machinery are used when necessary, including large cranes, ready mixed concrete trucks, and concrete pumps. In the less prosperous districts of major cities and other small towns the technology is more labour intensive, but building methods are generally a low quality copy of those used in the large cities. The following classification of building types in Iran was made by Spillane (1974) in his analysis of the housing production process at the time. For the purpose of this study the same classification is used, but with some modification in order to reflect the present day trends.

Class A
I) Engineering Structures (roads, dams, bridges etc)
II) Urban motorways and interchange systems
III) Industrial buildings
IV) Military and Defence installations
V) Urban single-storey family houses and villas
VI) Urban multi-storey walk up apartments

Class B
I) High rise apartments
II) Business and public buildings
III) Specialist buildings (hospitals etc)

Class C
I) Rural houses and buildings
II) Traditional irrigation systems and related buildings

In the 1970s, with the import of a number of housing production plants from both Socialist and Western countries, there was a tendency on the part of the government to encourage the use of prefabrication techniques for the speedy construction of housing units (M.H.U.D 1982). This system went into a steep decline as the result of a shortage of raw materials and breakdown of machinery resulting in the total closure of these plants for a number of years after the 1979 revolution However, in recent years, as the reinforced concrete method of construction has become popular, the medium sized production units of pre-cast concrete beams and other less sophisticated elements by the private sector have come into operation supplying the internal market. This has brought some standardisation in the building process.

The industrialisation of the building industry occurred as the consequence of the acute housing shortage in the Fourth Plan Period, when the previous administration announced that the

number of residential units per 1000 of the population had declined from 131 at the beginning of the programme to 121 at the end. At the same time the occupancy rate of 2.2 persons per room had gone up to 2.4 (Spillane 1974, p85).

At present one of the major problems of the construction industry in Iran is the lack of concise building regulation and standardisation at the national level. There are attempts to prepare building codes, but because of different climatic conditions in different parts of the country, a national set of codes will be inappropriate and therefore regional building codes are required. In the rural areas construction is mostly a self-build process based on traditional technology and locally available materials. The situation is rapidly changing, however, where the settlements are in close proximity to main communication links. In these areas much of the technology is a poor imitation of city technolgy of poor standards of both structural and aesthetic quality. In 1974, as part of his doctorate programme, James Spillane looked at the "Housing Production Process in Iran" and detected some weaknesses;

> "For example, poor structural design in rural buildings in regard to earthquake indicated the need for building standards and measures to aid self-help building in rural areas" (Spillane J S 1974, p86).

The situation has changed little since the early 1970s, although there have been large scale government initiated programmes in the earthquake damaged areas (Ghanbari Parsa 1985), and recently in the war affected areas. Unfortunately this has not resulted in a move towards an overall strategy for effective measures to provide a safer living environment for the population of these areas. The same pattern of technology transformation has occurred in the rural areas of the war affected zones in the south west of the country. A massive amount of government investment has been injected into the reconstruction of 1300 villages whose built form prior to the commencement of the war was reflected indigenous materials and techniques and traditional settlement patterns (Ghanbari Parsa 1988).

4:4.1 Urban Construction

The type of buildings in the urban areas, according to the classification put forward in earlier part of this chapter is, as follows;

Class A {
I) Engineering Structures (roads, dams, bridges ..)
II) Industrial buildings
III) Military and Defence installations
IV) Urban motorways and interchange systems
V) Urban single-storey family houses and villas
VI) Urban multi-storey walk up apartments

Class B {
I) High rise apartments
II) Business and public buildings
III) Specialist buildings (hospitals etc)

Construction activity is largely private sector but includes the government financed projects. The Ministry of Housing and Urban Development is primarily responsible for all urban development activities in a supervisory role, the Municipalities and other government departments in the actual implementation while the private contractors are responsible for the actual construction. Therefore the type of technology used in the building process, of all institutional financed projects, is determined by the planning and design offices of the organisations involved. Specialist projects which the domestic contractors are unable to carry out are put to international tenders.

The nature of urban construction has been largely determined by the planning policies adopted since the introduction of the First Municipality Act in 1913 (Mozayeni 1974). With the development of the planning system, the introduction of Master Plans had, to a large extent, a lasting impact on the shape of the urban fabric and construction. Therefore, in examining the construction industry it is vital to consider the link between the development of planning policies and their impact on the nature of operation of the industry. Therefore, in this context it is useful to look at four periods in the Twentieth Century.

4:4.1.1 The Pre-war Period 1906-1941

The first period involved the years between 1906 and 1941, which started with the advent of the constitutional movement and its desire for modernity, the establishment of Pahlavi Dynasty, the passing of a number of planning acts and, finally, the out-break of the Second World War and the invasion of Iran by the Allied forces. With the passing of the 1933 Street Widening Act, the physical basis of all major cities in Iran changed and there was a major demand for construction brought about as the result of large scale demolition of city centres and the construction of wide city avenues (Mozayeni 1974). This is best illustrated by the expansion and transformation of Tehran during the first decades of the ancien regime. By the mid-20th century, Tehran had expanded to 8000 hectares (Amirahmadi & Kiafar 1987, p168). This had caused a major transformation in the physical identity and spatial qualities of the City. based on the notion of modernisation and the establishment of 'modern' cities (Ferdowsian 1981, p65). As Lockhart (1939) notes:

> "In accordance with his authoritative policies of modernisation, and in an effort to symbolize the beginning of a 'new era' Reza Shah (1925-1941) had the city walls torn down in 1937. He also changed the urban fabric by constructing wide avenues cutting through old quarters." (Lockhart 1939, cited in Amirahmadi & Kiafar 1987, p170)

When the American (Alborz) college was constructed, the standard western brick (20*10*7.5 cm) was used and soon replaced the traditional Iranian square brick (24*24*4cm) (Rajabi 1976). Other events during this period include the Public and Administrative Building Construction Programme which comprised the construction of new and monumental structures, industrial centres, and urban development. The modern governmental buildings and the middle class houses were located in the new the new city built in the north of Tehran which embodied the urban fabric of European cities. According to Kiafar:

> "The physical appearance and qualities of modern Tehran were in sharp contrast to those of the old districts, most of which had evolved in conformation to the traditional Middle Eastern urban models". (Kiafar 1987 cited in Amirahmadi & Kiafar, 1987, p170)

In 1939, the construction of the Trans-Iranian railway was completed with the help of foreign contractors, mainly from Britain, Germany and America, who had started the construction work in 1928 (Nayerry, 1988). In a further development the School of Arts and Architecture was established at Tehran University along the lines of the Ecole des Beaux Arts at Paris (Wilber 1986). This could be viewed as the first indications of institutionalisation of architecture and construction training in Iran. Undoubtedly the influence of European style architecture and methods of construction were founded with the construction of the first high rise building in Tehran. This should be viewed as the turning point for the change in residential construction and Iranian house form. The courtyard houses of one or two storeys were built by the local masons aware of the indigenous architectural heritage and building technology (Ghezelbash & Abozzia, 1984).

The encounter with western technology and modern way of life was as the result of the construction of a modern infrastructure roads and bridges and the introduction of modern products such as furniture, radios etc. As Yarshater (1986) notes:

> "..... additionally, with increased urbanisation, two European house types that had been first introduced to Tehran in the late 1930s walk-up apartments and row-houses aligned to the new orthogonal, vehicular streets-became established as integral parts of the contemporary city. (Yarshater 1986, p352)

To sum up, it should be noted that during this period, as the result of government action through the initiation of large scale public building programmes and systematic change of the urban form, the construction industry was forced to look at new methods of construction in order to accommodate the desire for modernity pushed forward by the official policy.

4:4.1.2 Institutional Development 1941-1962

In the second period (1941-1962), with the advent of development planning, Iran underwent drastic changes both in physical and institutional aspects. The launch of the 1947 development plan (basically a list of projects) was the basis of much direct government expenditure in national projects. However,

as discussed in Chapter Three, this programme was aborted as the result of nationalisation of oil in 1951. The establishment of the PBO, was one of the first moves towards co-ordinated construction activities and proved especially useful by the time the oil dispute was settled. It therefore provided access to foreign exchange as the principle source of investment capital and had a direct impact on the well-being of the construction industry. The Second Development Plan, launched in 1954, coincided with the American Marshall Plan and the Point Four Programmes (Halliday 1979, Razavi et al 1984, Mofid 1987). The focus of the programme, i.e infrastructural development and industrialisation, resulted in many national projects, including hydro-electric dam projects and road construction. A major programme of public building construction helped revitalise construction demand and was very favourable for the private construction sector.

The economic boom of 1957-59 gave rise to a major expansion of urban housing development carried out mainly by the private sector. Apartment buildings introduced in the late 1930s became popular with private developers. This method of construction was possible with the increased use of steel frame and engineering bricks. The development of the construction industry during the second period of study (1941-62), was largely influenced by contact with western planning policies and modern technology mainly through the U.S Marshall Plan and Point Four Programme. In fact, the major dam construction programmes were as the result of the influence of the Tennessee Valley Administration Programme as a strategy for regional development (as discussed in Chapter Three).

The large scale intervention by the state through planning and the expansion of public sector industries was based on the co-operation of a "triple alliance" of local bourgeoisie and international capital in the form of numerous joint ventures (Amirahmadi et al 1987, p171). The establishment of the modern bourgois class had an impact on the urban environment and the construction industry. As suggested by Kiafar:

> "Members of this class primarily invested in urban areas and in such high profit-making activities as real estate, construction and urban land speculation". (Kiafar 1986)

4:4.1.3 The Third Period (1963-1973) Consolidation

During the third period, significant changes in the field of town planning had a profound effect on the construction industry. A number of major events contributed to this process. In 1962, at the time of the "white revolution", measures were introduced to reform the issue of land ownership. During the same year a major earthquake in Boyen Zahra caused 10,000 fatalities and a large degree of devastation (I.G.U.T). In 1963 the Third Development Plan was launched with particular emphasis on health and educational building facilities. New urban settlements were planned and large scale construction was undertaken as the result of the introduction of Master Plans. The immediate impact of the master plan approach on the construction industry was manifested in the form of a rapid increase in urban land prices and the resulting property boom (1966-71) initiated by the private sector. The first wave of mass produced apartment tower blocks was constructed during this period, illustrating the start of the industrialisation of the building production system.

In 1964, the feasibility study of the twenty-five year Phased Physical Development Plan commenced (Yarshater 1986, McLachlan 1988) and by 1968, it was completed and subsequently approved by the High Council of City Planning. In 1968, as the Fourth Development Plan (1968-73) was being launched, a major earthquake devastated a large part of Khorasan Province causing 10,000 casualties (Ambraseys 1982). The earthquake was followed by a major reconstruction programme (Art & Architecture, 1969) by the Iranian Government and international assistance, (Ghanbari Parsa, 1985).

The principal objectives of the Fourth Plan, were the drive for industrialisation the development of the infrastructure, and the approval of many new Master Plans for major cities throughout Iran. The particular planning strategies of this Plan period included the Growth Pole Strategy, and the development of New Towns, especially satellite towns, the most important of which was Aryashar (Pouladshahr) near Isfahan (Ferdowsian 1981, Art & Architecture 1977). These two policies had profound impacts on the construction industry, mainly the strengthening of the private sector construction which undertook the development of whole new towns near the cities of Isfahan and Tehran.

The holding of the 1972 Asian Games in Tehran necessitated the construction of the Olympic Village and the 100,000 seat Azadi Stadium with related facilities between 1968-72 in Tehran, designed and constructed by Iranian consultants and contractors (Ardalan 1986). The militarisation programme also involved the development of major air and sea bases, including the expansion of Bandar Abbas as the main naval port and headquarters, which had the most dramatic impact on the development of this coastal city (Halliday F 1979). The development of the construction industry in the period of 1963-73 was largely due to the adoption of planning policies, particularly in the form of Master Plans, New Town Development, Growth Pole strategy and the economic and political stability which gave rise to a major building boom (1966-71). The shape of urban construction was predominantly determined by the influence of international contacts, further reinforced by the return of the first generation of foreign trained professional architects, engineers and planners. This particular factor had a lasting impact on the shape of national planning and local construction capability (Ardalan 1986).

The impact of the work of such professionals on the physical environment that they helped create can be attributed to the fact that most of them came from well-to-do families, at least prior to 1974, when free eduction was introduced. The effects of increased oil revenue on the middle classes was only felt in the mid-1970s. Most of the architects and other foreign trained professionals who returned to Iran during this period worked either for government ministries , municipalities and other agencies, or entered private practice. Through their private practice their impact was not so dramatic as their clients were only wealthy people who could afford to employ the services of architects. However, their involvement with the public sector agencies, especially the PBO, MHUD and municipalities, had a direct impact on the urban fabric. Once in charge, their house and settlement design was based on imported principles because of the nature of their education. In her criticism of foreign trained professionals and their impact on housing, Ferdowsian argues:

> "The application of the western concept of housing in the society by the educated architects has resulted in applying high technology to produce a larger quantity of houses with the lowest possible quality and cost and this has had a big effect on people's way of life in adapting

> themselves to change. For example life in flats is substituting the courtyard." (Ferdowsian 1981, p73-74)

On the impact of foreign educated designers and planners on the built environment in the developing countries Ive (1985) observes:

> "It would perhaps be too harsh and too sweeping to say that the quality of post-colonial academic 'human exports' to Africa has been little higher than that, on the average, of Europe's colonial human and non-human export to the same places. Nevertheless, every vacuousness, every complacency, every neglect that can be found in the worst of the literature on the 'urban' or on construction in England can be found writ large in the typical products of expert consultancies, World Bank contractors, etc., applied unblushingly to the study of Africa". (Ive, 1985, cited in Shanti Jayewardene 1988, pp70-75)

It can be argued that the environment that was created by the foreign trained Iranian professionals neither resembled the traditional urban fabric of Iran nor provided the modern western city. The modern cities not only did not improve the spatial distribution of resources but they became congested centres of production and administration with large areas of sub-standard housing and environmentally undesirable land. In this way the role of such professionals was more dangerous than that of expatriate consultants.

4:4.1.4 Industrialisation and the Construction Boom 1973-1979

The fourth period (1973-79), marked the turning point for the development of urban construction, as it was largely affected by the sudden increase in foreign exchange revenues of the government as the result of the oil price increases of 1973. The development policies adopted during this period had a direct impact on the construction industry, especially the "big push" or industrialisation policy. The large scale development of new and satellite towns, as advocated in the Fifth Development Plan in 1973, and the large scale revitalisation of inner cities prompted the six year construction boom.

On the relationship between building design and production, planning and their impact on construction McGhie argues that:

> "In the first instance, and predominantly. construction has been industrialised, not via the systemised prefabrication of buildings, but via the industrialised production of all materials and parts, not by builders but by industrial manufacturers and heavy industry" (McGhie, 1982, cited in S. Jayewardene 1988, pp70-75)

Amongst the planning measures which were taken to alleviate the urban housing problem was an increase housing density in the central districts by apartment building replacing the court yard housing. A more detailed analysis of this policy will be provided in Chapter Six. The activities of international consultants and contractors during this time was most profound and it resulted in the preparation of many Master Plans for new development or redevelopment of existing settlements; amongst these mention can be made of Bandar Shahpour New Town by Mandala Collaboratives and SOM. In 1974 the Second International Congress of Architects entitled "Toward a Quality of Life" was held in Tehran, which brought together the leading international architects and urbanists, amongst them Kenzo Tange, Buckminster Fuller, Jose Luis Sert and Mohsen Forugi. A group of Iranian and foreign architects, amongst them Jose Luis Sert, Moshe Safdi, B.K Doshi, George Candilis and Nader Ardalan, prepared the Habitat Bill of Rights for the Ministry of Housing and Urban Development which was Iran's contribution to the UN Habitat Conference in Vancouver, Canada (Government of Iran, 1976). The impact of such planning principles based on the western patterns of development and quite often prepared by foreign practitioners on urban construction in Iran, been most profound.

The process of planning and construction during this period occurred very speedily thus leaving hardly any time for appraisal. The rapid growth of the economy surpassed consideration for a healthy and human environment. The process of urban development and concern for its quality was replaced by speculation of land and buildings (Kowsar 1977, p148). This was partially encouraged by the Master Plan Approach and official policy which allowed the private developers to build outside the city boundaries whatever considered most profitable. Such developments were carried out by both Iranian and foreign speculators. It should be noted that in criticising the role

of expatriate consultants and foreign trained professionals it is not attempted to reject all external influences. On the contrary, as Ghandi says:

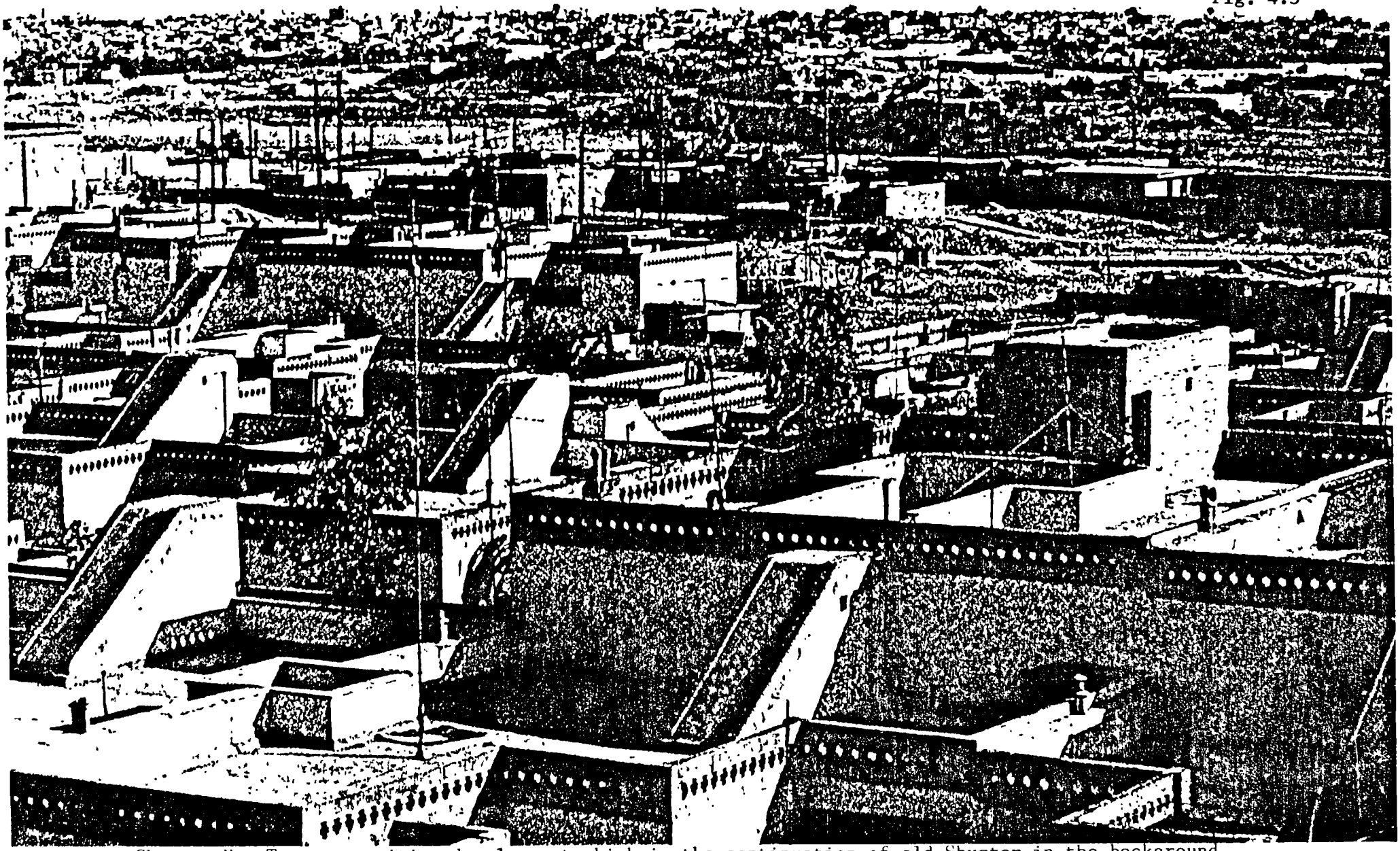
> "I do not want to have high walls around my home and all of its openings closed, I want the breeze from all civilisations of the world to blow freely around my house while, at the same time, I do not want the breeze to sweep me away with it". (Mahatma Ghandi, cited in Kowsar 1977)

The 1973 launch of the revised Fifth Plan, with its emphasis on industrialisation and particular attention to urban housing, culminated in the "crash housing programme" and further development of new towns. Of the more successful new towns which were constructed during this period Shushtar New Town has become especially renowned, mainly for its design and method of construction which pays due attention to local and national culture and utilises locally available construction materials and resources (Mimar 1985). The development of Shushtar New Town was as the result of the last phases of Khuzistan Development, based on the TVA experience which had started in 1956 (Amirahmadi, 1986, p506). Shushtar was conceived as a company town to house "the newly urbanised proletariate in a traditional Muslim culture." (Mimar 1985, p49)

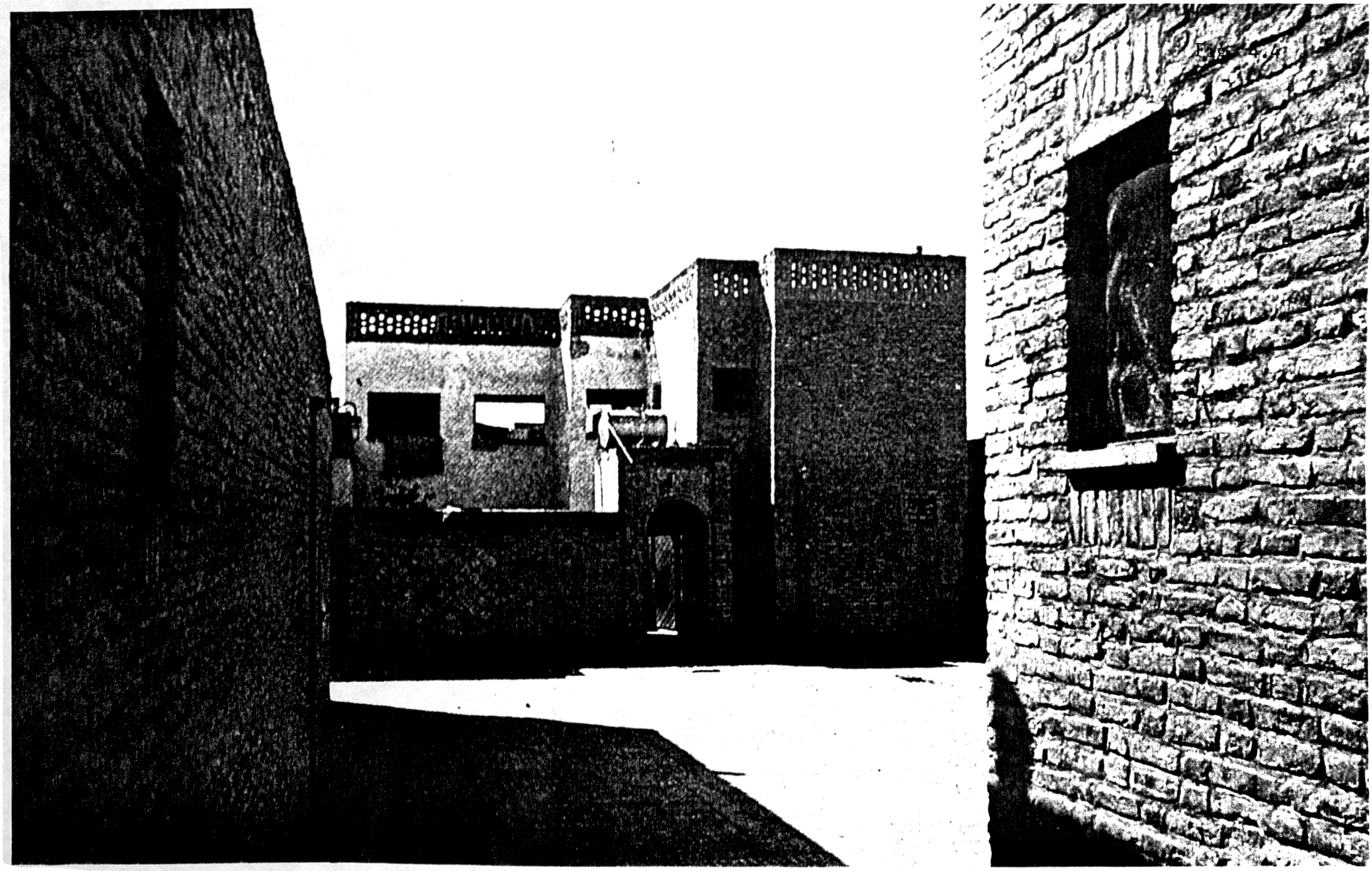
As part of the Fourth Plan, Dez Dam was contructed in northern Khuzistan to develop agricultural resources in this province. A new sugar cane production facility nearby necessitated the development of new housing. Shushtar New Town was in a way an extension of the old Shushtar across the river, as illustrated by the photograph (Figure 4.3).

The construction method employed in Shushtar New Town, is primarily labour intensive. Load bearing walls are built of bricks, produced locally (Figure 4.4) placed on concrete footings at 4 metres spacing. Roofs are framed with steel beams supported on the walls or engaged piers, and between each beam are formed the traditional brick barrel vaults springing from the bottom flanges of the beams. The project became one of the Aga Khan Architecture awarad winners, and it is pertinent to reflect some of the comments made by the Jury in their assessment of the project;

Fig. 4.3



Shuster New Town as positive development which is the continuation of old Shuster in the background, respecting the environment and the traditional settlement pattern.



The choice of construction technology and use of locally available materials in Shuster ensures the creation of a pleasant environment which blends in harmony with the local tradition.

> "after five years of war, despite the unsettled conditions in the area, our photographs testify to the fact that New Shushtar lives. Adaptations and personalisation of the dwellings to meet the residents' desires have occurred, wall paintings reflecting the times have appeared as they do everywhere, but basically one senses an acceptance and respect for the quality of the physical environment that has been offered. This example of urban housing is relatively unique, as a large-scale new town conceived and produced by local designers and builders (as opposed to imported ones) attempting to satisfy the indigenous life-style and contemporary goals of industrial development (Mimar 1985, p52)."

It is unfortunate that much of the urban construction carried out in the six year building boom did not adhere to the same principles as the above example but had a negative impact on the socio-economic environment before it came to a complete halt in 1979.

In 1978, during the political turmoil which had gripped the country, another devastating earthquake affected the beautiful city of Tabas and its surrounding villages with 20,000 casualties. This highlighted once again the ever present danger of seismic activity in many parts of the country, including the urban centres. The aftermath produced the largest scale reconstruction programme ever undertaken in Iran (Ghanbari Parsa 1985). Tabas earthquake revived the arguments about a national building regulation regarding earthquakes and construction standards, an issue which had not previously been given any serious consideration. In summing up the analysis of the urban construction scene in the period 1973-79, it could be said that it was an opportunity that was missed, and was highlighted by massive wastage of valuable investment capital and resources. Whilst most foreign consultants and contractors gained as the result of the boom years, urban construction resembled a confusion state of development based on foreign principles. In his analysis of the development of Iranian architecture and planning since the end of the second world war, Ardalan notes that;

> "Among the cultural losses was a certain traditional Iranian "way of life" evidenced by the destruction of many residential quarters in the old towns of Iran, and this affected the full range of income groups. There was

> also a loss of the familiar human scale in the built environment. No new spatial order replaced the traditional order that had grown from a handcrafted technology of building" (Ardalan 1986, p354).

In his analysis of the impact of the industrialisation policy on the urban environment he further adds;

> "This inability to fill the void caused by rapid industrialisation, urbanisation, and secularisation is a commonplace problem confronting all rapidly transforming traditional societies, not only that of Iran; nevertheless, the lack of cultural and spatial relatedness of the new urban environments of Iran to their traditional, existing patterns only fostered alienation and unrest. Ecologically one must count as a loss the inefficient new growth and form of the human settlements of Iran. Tehran with its massive population explosion of the 1970s was not environmentally able to support the large demands put upon it with respect to water supply and adequate green space for its citizens". (Ardalan 1986, p354)

4:4.1.5 The Austerity Period (1979-1989)

Urban construction has gone through periods of expansion and recession mainly reflecting the political and economic climate in the country. The population explosion that occurred in the 1970s, according to Ardalan, was negligible in comparison with what happened not only in Tehran but in other Iranian cities. Apart from direct physical destruction, the massive urbanisation that occurred as the result of the war and ill conceived policies, put additional pressure on urban housing. The construction industry, starved of investment, was in no condition to accommodate the need for massive construction in the urban centres. The limited civilian construction activity of the period included some infrastructural development, rural road construction, and speculative urban construction by the private sector.

The planners who inherited the management of the urban and rural environment from those who had initiated much of the 1970s expansion (and had chosen to escape the revolution because of their ideology), opposed much of what had been

done. Therefore many of the Master Plans which had been produced previously were revised in order to mark a turning point in the management and development of the urban centres. This point is clearly illustrated by the recent document published by the MHUD on the preparation of Comprehensive City Development Plans. It singles out the following as the most critical factors for the failure of such Master Plans:

a. lack of unity in the preparation of plans and the consideration of future changes in socio-economic conditions in the cities,
b. lack of a unified approach to link the policies for urban growth of such plans with regional and national plans, and
c. lack of flexibility to allow for modifications based on factual changes at different times and the new demands by a responsible system. (MHUD, Appraisal and methods of preparation of Comprehensive Urban Development Plans p3)

Again there have been gains and losses. Much finance and resources were wasted in some ill-fated projects. Under the slogan of assisting the underprivileged population in the less prosperous parts of cities, the new planners and architects began the same cycle of bulldozing the old quarter of cities in order to provide boulevards and wide avenues for the people of these areas. The war economy had already caused a shortage of many building materials, but this was further complicated by the new system of resource allocation. The reinforced concrete method of construction was encouraged throughout the country in order to ease the acute shortage of structural steel (Ghanbari Parsa 1987). This in itself caused a severe shortage of cement and reinforcement bars. In general during this period the construction industry has been affected by:

Firstly the decline in the value of oil exports and therefore the drop in foreign exchange earnings;

Secondly the outbreak of the Iran-Iraq war which lasted for eight years and thus diverted much of the resources to the war related projects;

Thirdly the re-organisation of the planning system and desire for less prestigous projects, at least in theory.

4:4.1.5.1 Diminished Investment

The decline in oil revenue caused a sudden halt to the import of much of the construction materials and equipment that were traditionally purchased from international sources and paid for by oil exports. There was lack of also a reduction in investment in development and public works programmes and, thus a stagnant construction demand. Many of the projects that had started prior to 1979 were cancelled, including the Second International Airport at Tehran, the Electrification of the Mashhad-Tehran and Tehran-Khoramshahr Rail-route, and Tehran Metro System. The early rise in urban development expenditure as indicated by Table 4.2, can be attributed partially to the effect of inflation. The increase in real terms accounted for by the improvement of the lower income areas of some of the large cities. A more detailed examination this will be provided in the later parts of this chapter.

4:4.1.5.2 The Impact of the War

The immediate impact of the outbreak of the Iran-Iraq war, on urban construction was the physical destruction of a number of cities and infrastructure facilities. As the war progressed, its impact on the economic condition of the country was disastrous and caused further decline of construction related activities. The urge to pursue the war meant that most of the public and private sector construction resources, such as construction machinery and materials, had to be mobilised and sent to the war front. This caused a more serious shortage of such essential items and created the two tier economy. The war had other effects on the physical shape of the cities and transport and industrial infrastructure. Each phase of the war involved a different degree of destruction. Although for most parts of the war many cities far from the war front initially escaped massive air and missile strikes, the "war of cities" in 1985 and 1987-88 caused large scale indiscriminate damage to the fabric of the major cities, including Tehran, Isfahan, Shiraz, Arak and Tabriz. It was due to the constant aerial attacks on Tehran that the construction of Tehran Metro was revived.

The Tehran Metro Project had started in the 1970s and had been cancelled as a result of the revolution and the criticism that

Table 4.2: Government Expenditure on consturction and housing and urban development in urban areas between 1973 and 1984.

(Current prices, million rials)

YEAR	Government Buildings & Services	Housing Expenditure	Urban Development	TOTAL
1973	31.6	13.5	3.0	48.1
1974	45.1	36.2	8.9	90.2
1975	68.6	51.8	11.5	131.9
1976	67.0	66.8	13.4	147.2
1977	62.5	77.1	24.4	164.0
1978	6.1	39.4	12.1	57.6
1979	17.3	38.1	20.2	75.6
1980	19.9	53.1	18.2	91.30
1981	29.6	52.7	21.8	104.1
1982	25.6	63.6	18.4	107.6
1983	25.2	67.5	18.3	111.0
1984	24.1	44.9	9.6	78.6

Source: Bank Markazi Iran, 1985.

it was too ambitious and too expensive. It has been argued (Haami 1987) that instead of the proposed Metro System there could be an additional 2565 km of railway added to the present network, or 4378 km of new road, which would open up many parts of Iran for development. Another suggestion was that by spending the same amount in the agriculture sector, 85,000 derelict Qanat systems and springs could be saved which would make it possible to bring an additional 30% of the land under cultivation. However as mentioned in Chapter Three, despite all the arguments, it was essentially a strategic and political decision to restart the construction of Tehran Metro (Haami 1987). During the parliamentary debate over the fate of the scheme, the speaker Mr Hashemi Rafsanjani said:

> "as to the dependency on imported technology and material, for the first two years of building a tunnel, it would mainly need cement and round bars produced at home. Moreover, the excavating machinery has been imported for the project long ago and has been gathering dust for ten years" (San'at-e Haml-o Naghl p1-2 1987).

Other construction activities which have been revived as the result of the war include the large scale conversion of existing structures and construction of new air raid shelters in Tehran and many other border towns.

4:4.1.5.3 Towards a New Planning System

The third factor affecting the construction industry during this period involved the reorganisation of the planning system and will have a longer term influence on the shape of urban construction. The rejection of many of the previously prepared master plans was based on the fact that many of these plans did not adhere to the cultural and traditional identity of Iranian settlement patterns. The new approach emphasised the need to preserve the fabric of Iranian cities, thus there should be no further large scale demolition of city centres. An example of such a move was the circulation of a list of research topics from the Ministry of Housing and Urban Development to all Iranian students who were to embark on research programmes at different universities in Europe and the U.S. The list emphasised the need for research on ways to safeguard the existing settlement patterns and use of local resources in

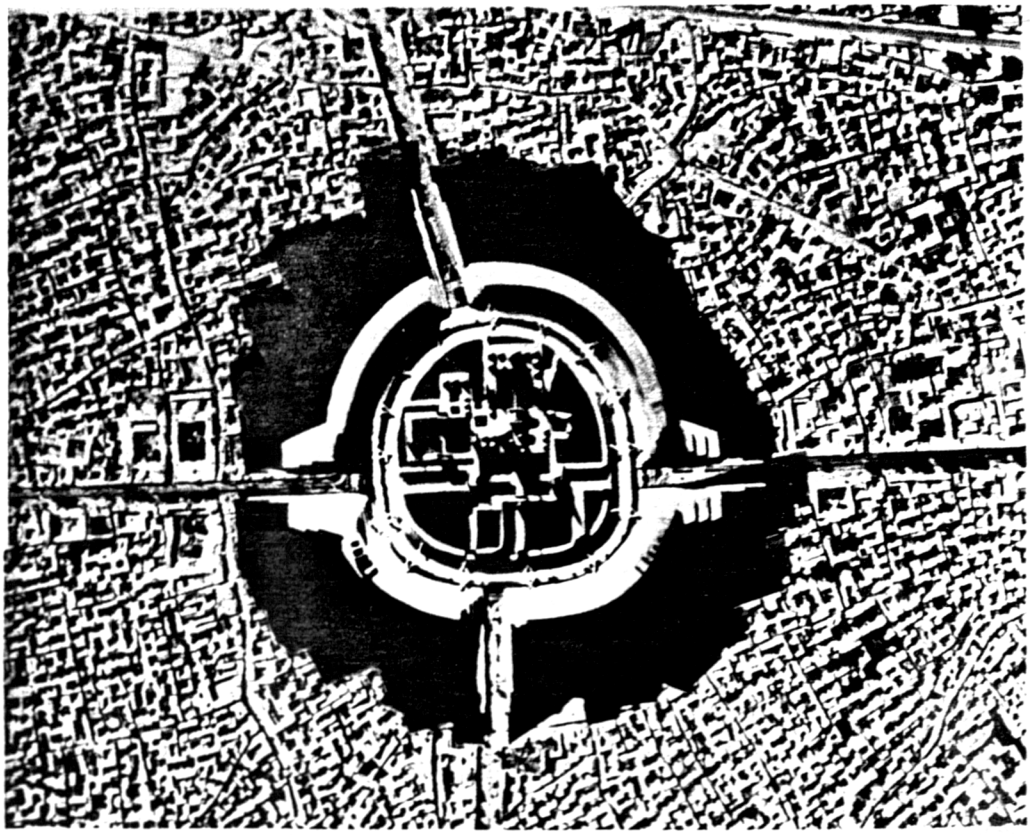
the design and construction of new projects. In fact, many new settlements that have been built either by the Government or other para-statal agencies have been very realistic in their design and methods of construction.

An interesting example of the change in planning approaches is the Preservation and Redevelopment of Mashhad City Centre scheme. The original scheme was the most important of the Urban Renewal programmes undertaken in Iran in the 1960s and 1970s. The initial plan, designed by Darius Borbor, was supposed to have followed the traditional idea of circular planning and included a multi-level development for the whole of the area surrounding the Great Shrine buildings (Figures 4.5 and 4.6). As a result of the original scheme, many of the existing buildings and old bazars were demolished in order to provide space for new avenues. An area of 500 m radius from the centre of the Shrine complex was demolished, leaving the Shrine buildings and creating a green area between the proposed buildings and the rest of the city. Fortunately the 1979 events disrupted the implementation of the proposed buildings, including new commercial and shopping facilities. In the years since 1979 however, a new plan has been prepared for the area, thus providing a more realistic approach to the traditional Islamic and Iranian architecture.

The new plan creates a new Islamic University, comprising a large library, dormitories, and related facilities which have been accommodated within some of the existing buildings. The new buildings blend with the existing architecture and planning principles (Figures 4.7 & 4.8). The project, which is at present one of the largest civilian projects in Iran, is currently underway and indigenous construction solutions have been employed. New methods of production have been invented in order to produce tiles and bricks that look the same as those used in past centuries (Figure 4.9.

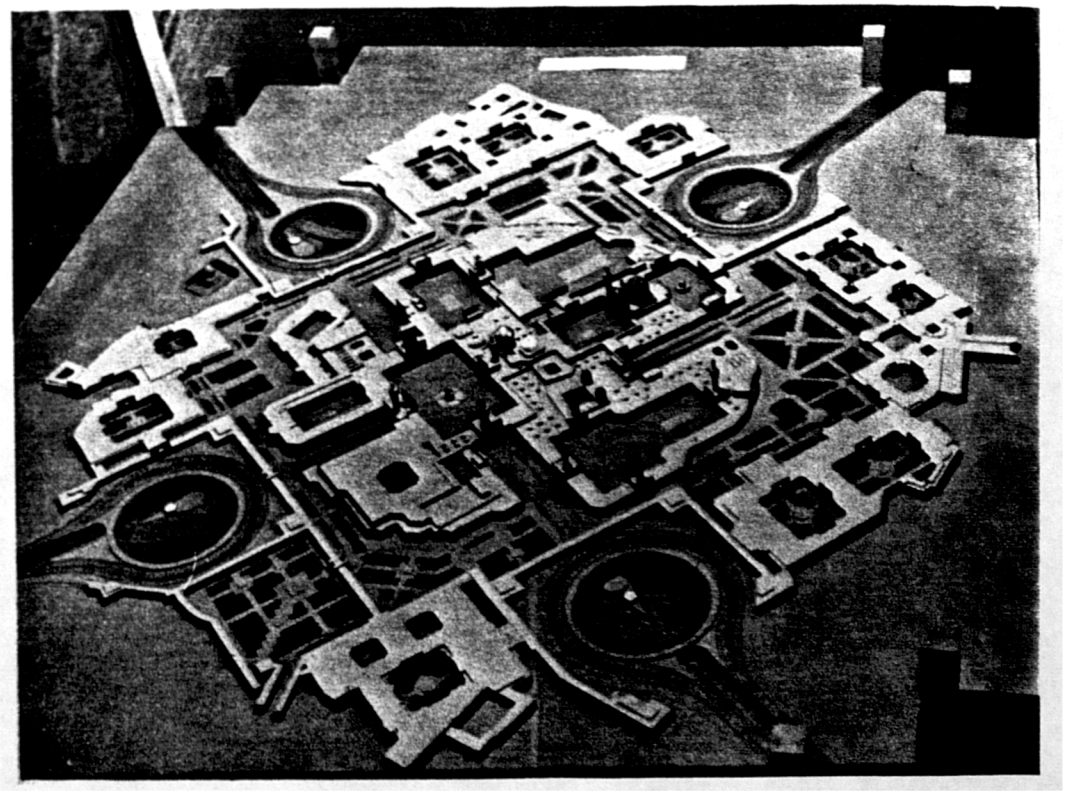
Whilst making selective use of the most up-to-date construction machinery and equipment, labour intensive methods of construction are employed in order to save cost and also create employment during a period of general construction inactivity (Deyshidi & Ghanbari Parsa). An example of this was found during a site visit in April 1988 (Figure 4.12). The excavation of all of the deep piles, which are numbered in hundreds, was carried out entirely by emigre labour, thus reducing the cost of the operation by over 50%.

Figure 4.5. The aerial view of the original plan model for Mashhad City Centre Development by D. Borbor.



Source: Borbor, 1975. "urban Planning in Iran", in D. Whittick Encyclopedia of Urban planning.

Figure 4.6. The view of the new model for Development of the Historic Centre of Mashhad. (Curtsy of Astane Qodse Razavi, 1988)



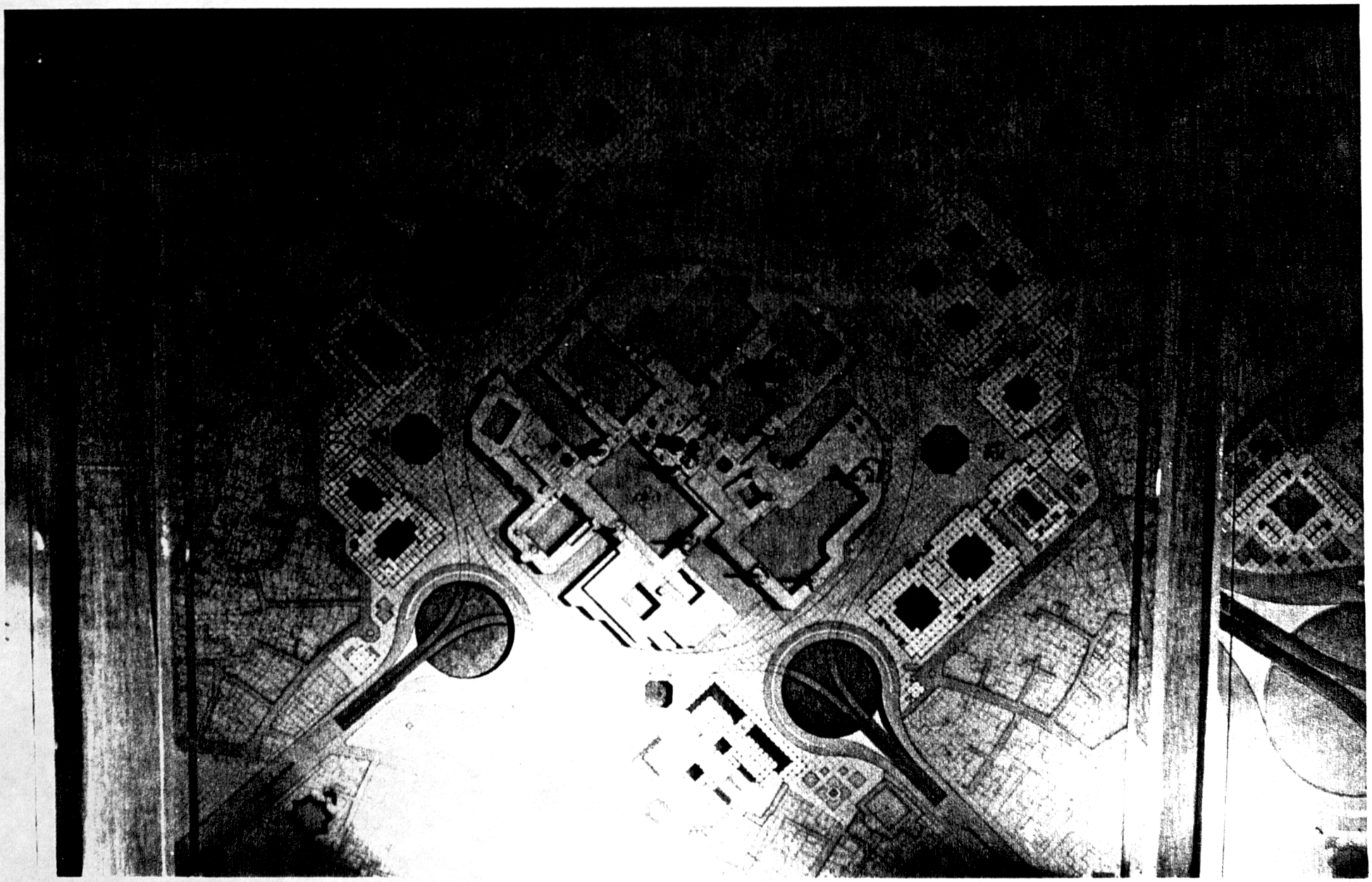


Fig. 4.7
Part of the model of the new proposed development plan for the historic centre of Mashhad

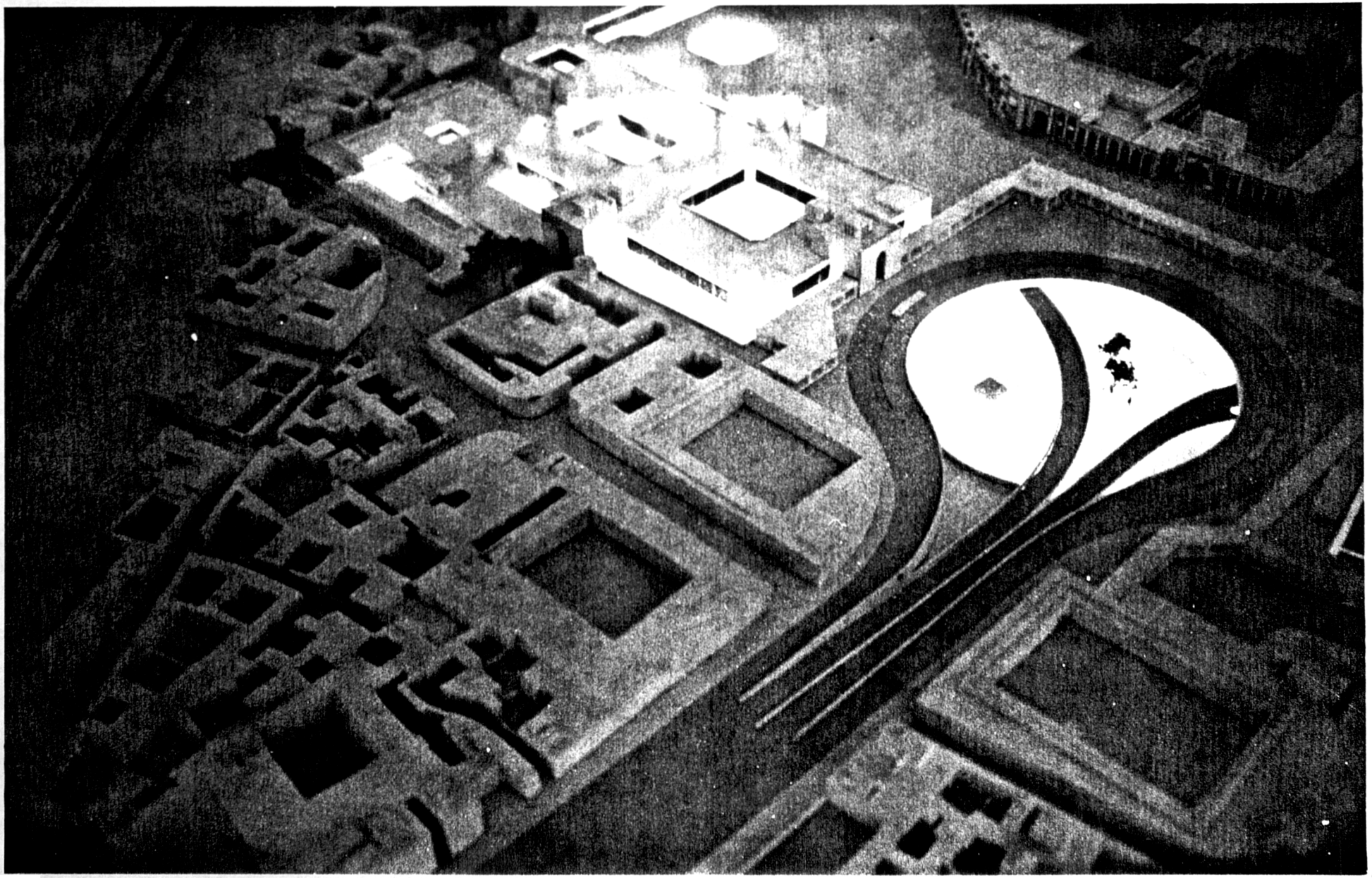
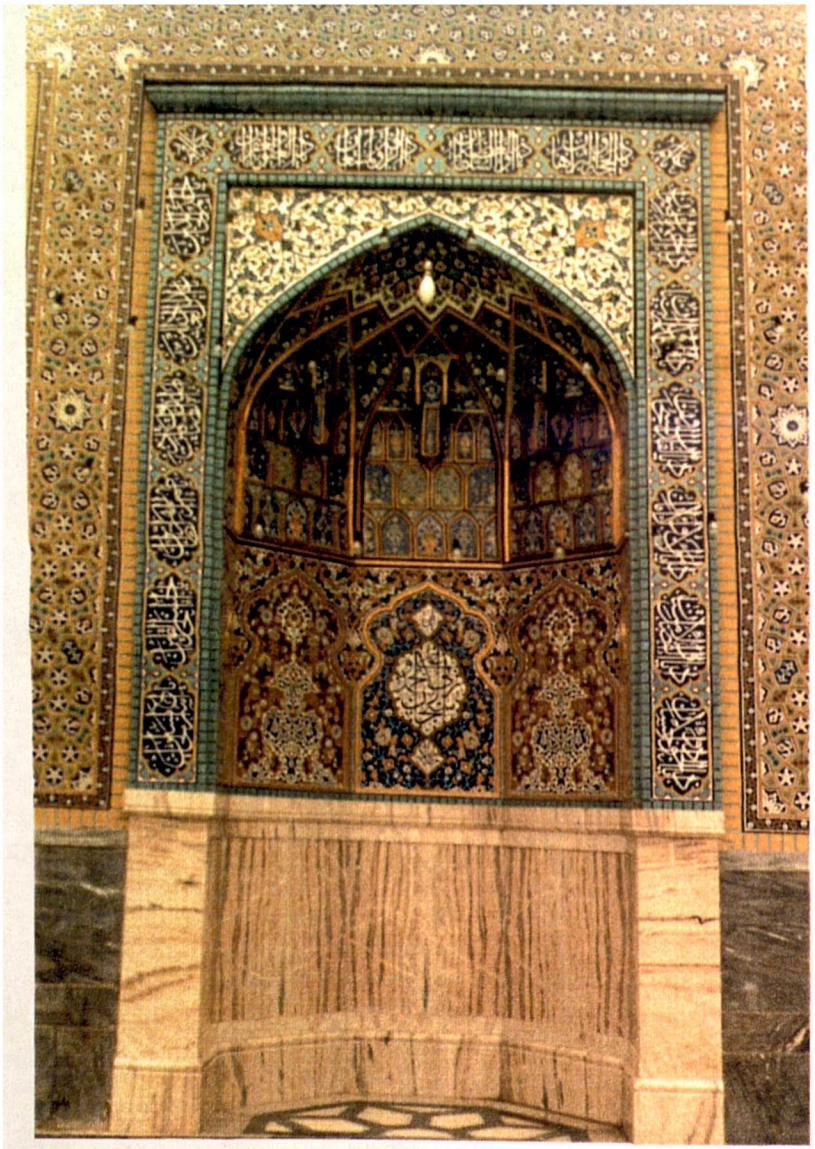


Fig. 4.8
Part of the model for the new proposed plan in Mashhad in the 1980s. Note the new developments in the open spaces which were cleared in the 1970s plan.



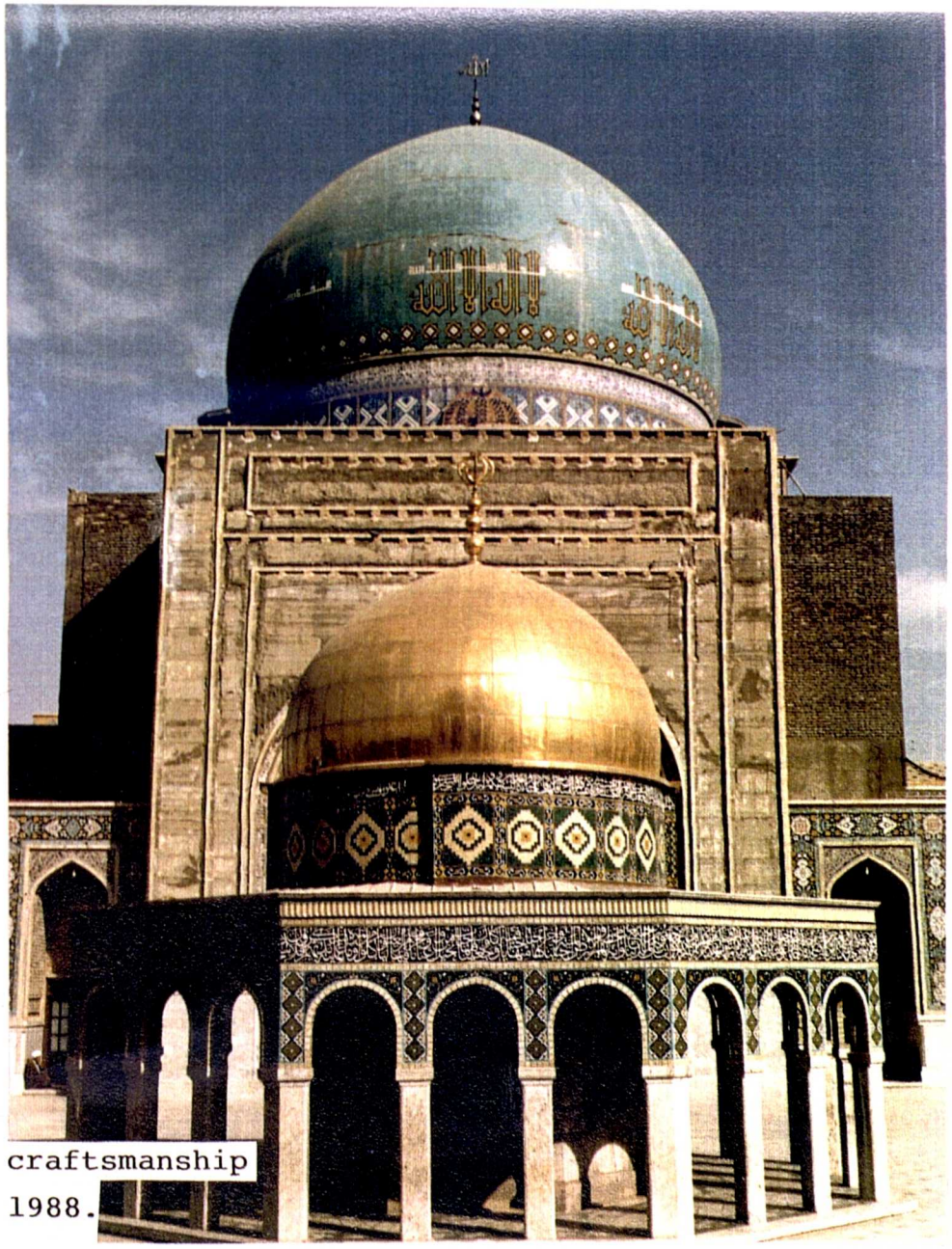


Figure 4.9. An example of the quality of the craftsmanship for the new development. Mashhad 1988.

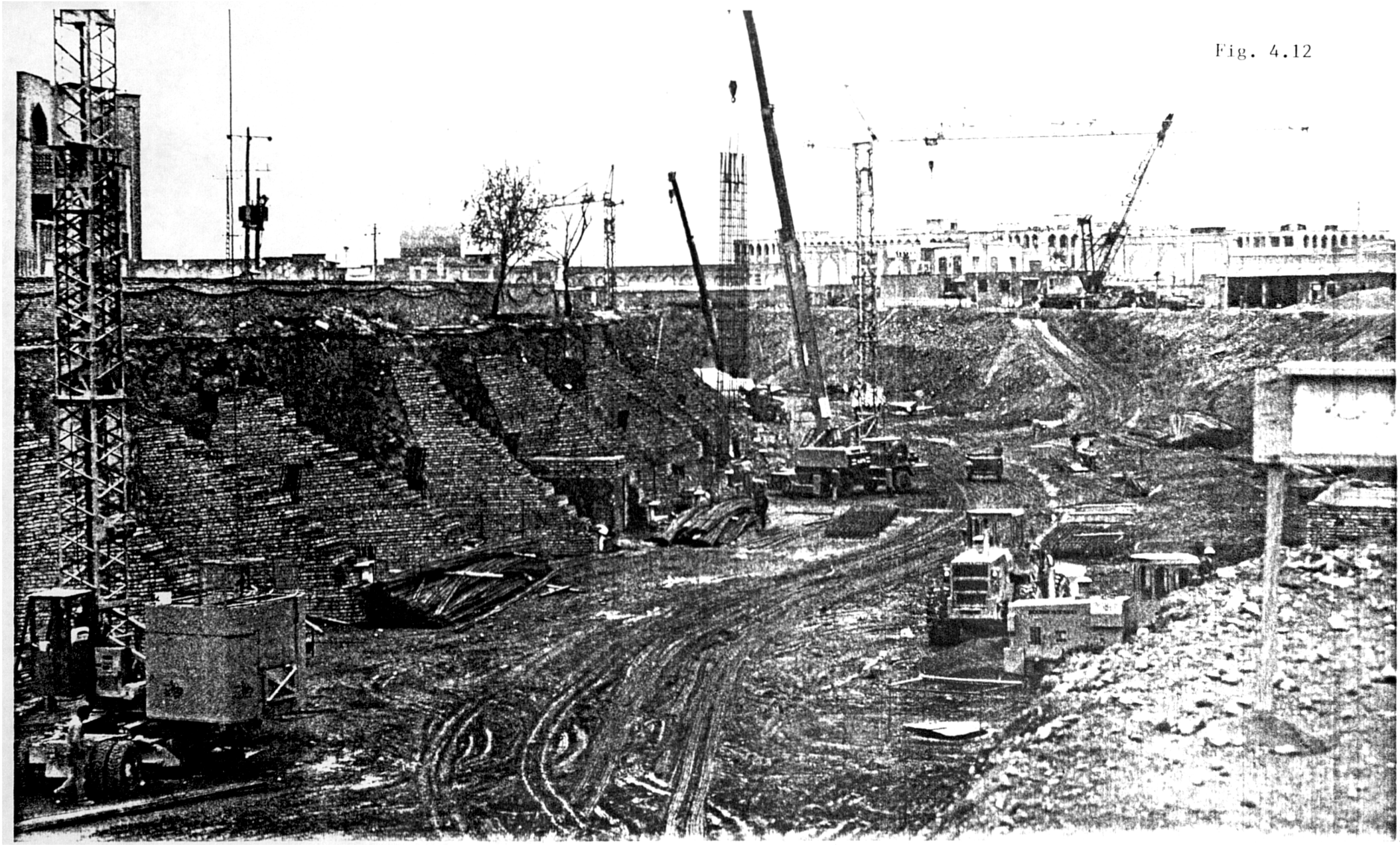
for the new development. Mashhad 1988.

Figures 4.10 & 4.11. Parts of the new development near completion (H. Deyshidi)





Fig. 4.12



The use of modern construction technology in the implementation of the new development in Mashhad

During 1979-89, hardship has encouraged the indigenous construction industry. Furthermore, the new physical planning policies for urban areas do have, at least in theory a framework for a more realistic design and construction procedure. With the conclusion of the examination of urban construction between 1906 and 1979, the next section examines the nature of rural conastruction.

4:4.2 Rural Construction

By nature most rural construction is carried out in a self-help and community based process which caters for the majority of rural housing and the village based irrigation system. However, for the large scale national projects, rural construction has been dominated by the government sector. The level of activity and, indeed, the nature of rural construction, has been mainly predetermined by the policies regarding rural development. Therefore, in order to analyse the rural construction situation, the overall rural development in two periods isstudied, firstly the pre-1979 era and secondly the post-1979 period.

4:4.2.1 The pre-1979 Period

Although the issue of regional development in general and rural development in particular was largely neglected in this period of study, what happened in practice was the product of planning policies initiated during the reign of the ancien regime. As discussed in Chapter Three and earlier parts of this chapter, a number of regional planning strategies that were adopted in different development plans resulted in a number of large scale rural development projects, for example large scale dam construction and irrigation schemes. The major strategy which changed the rural scene was undoubtedly the launch of the "white revolution" in 1963 by the Shah, especially the Land Reform Bill. This led to the break-down of the fuedal system prevailing in the rural areas.

Other factors contributing to the change in rural construction have been numerous earthquakes which have caused large scale destruction, especially in rural villages, due to the unstable nature of dwellings and building methods and materials

(Ghanbari Parsa 1985, 1988). As the result of such hazards, large scale reconstruction is often required in order to compensate the local population, who otherwise will not have the financial ability to undertake the rebuilding process.

The establishment of Moughan Plain Development Institution in 1953, the Khuzistan Development Authority in 1956, and the Southern Development Services in Sistan and Baluchistan, were amongst the most important regional planning policies adopted to develop the rural areas in these regions along the model of the Tennessee Valley Authority Approach (Amirahmadi 1986). Such projects led to the development of a number of large dams and irrigation schemes (McLachlann 1988), as explained in Chapter Three and section 4:4.1.4 of this chapter.

Other planning strategies, including the Growth-pole Strategy and Capital-Oriented Policy, pursued during the Third Plan, led to the creation of large scale industrial and agricultural poles in various parts of the country (PBO 1977). During the Fourth Plan large scale farming, animal husbandry, and fisheries, all using the most advanced techniques, were planned and implemented in large agricultural poles located in the vicinity of large dams and places where modern irrigation methods were applied. For example, around one billion dollars invested in Khuzistan Development Authority (Amirahmadi, 1986, Mofid 1987). This undoubtedly had a profound impact on the nature of rural construction in these areas.

Thousands of Iranian villages are scattered in remote areas of the country and the development of these areas has proved very difficult. To this effect, in 1964, as part of the industrialisation policy, the planners were told to prepare contingency plans to accommodate a reversal of the urban/rural population changes for the 1990s. The 60,000 scattered villages throughout the desolate parts of the Iranian plateau were to be coalesced into approximately 15,000 super-villages structured upon mechanised farming principles. The plan was to facilitate access to central education, health facilities and the marketplace, which were conceived as benefits of the process. However, the enormous effort and complications ensuing from the displacement of millions of rural dwellers was never fully appreciated (Yarshater 1986). It is also important to point out that the need for such a plan has in part arisen as the result of the impact of the earthquakes which have frequently ravaged these villages.

It can be assumed that the nature of rural construction during the period between the end of the Second World War and prior to 1979 coincided with institutional planning. The limited change that occurred in the rural construction process during this time was, therefore, as the result of the direct impact of the planning strategies such as the TVA approach, and Growth Pole strategy. In addition, the need for a large scale reconstruction programme in the aftermath of natural hazards such as earthquakes was another factor influencing rural construction. Most of the large scale rural construction projects which were implemented were carried out by large international consultants and contractors with the use of modern technology. The following section will provide an analysis of the rural construction and development since 1979.

4:4.2.2 Rural Construction Since 1979

Rural construction has been the focus of attention of the public sector in recent years partly by choice, but more significantly due to the gravity of the situation created by unsafe shelter in those areas prone to damage and destruction by seismic activities, other natural hazards and, of course, war. The 1978 Tabas earthquake and a series of other earthquakes in Khorasan, Kerman and Fars Provinces in the early years of the revolution prompted the government to initiate a series of large scale reconstruction programmes in these areas.

The issue of rural development became the subject of hot political debate, both during and after the revolution. In recent years there has been large scale development in spreading the rural road network, in the maintenance and expansion of irrigation systems, and the increase in the number of settlements served by electricity and gas supply facilities. These developments took place mainly due to the promises of the revolution and the well-intentioned policies of the planners. But, despite all this effort, revitalising the rural areas, both in economic terms and physically, remains a large task. Construction in the rural areas primarily concerns the building of houses and other buildings such as mosques and small irrigation networks by the private sector. This has always been the result of the self build process and the use of locally available materials and indigenous techniques of construction. However, the thousands of scattered rural settlements are desperately in need of physical improvement to

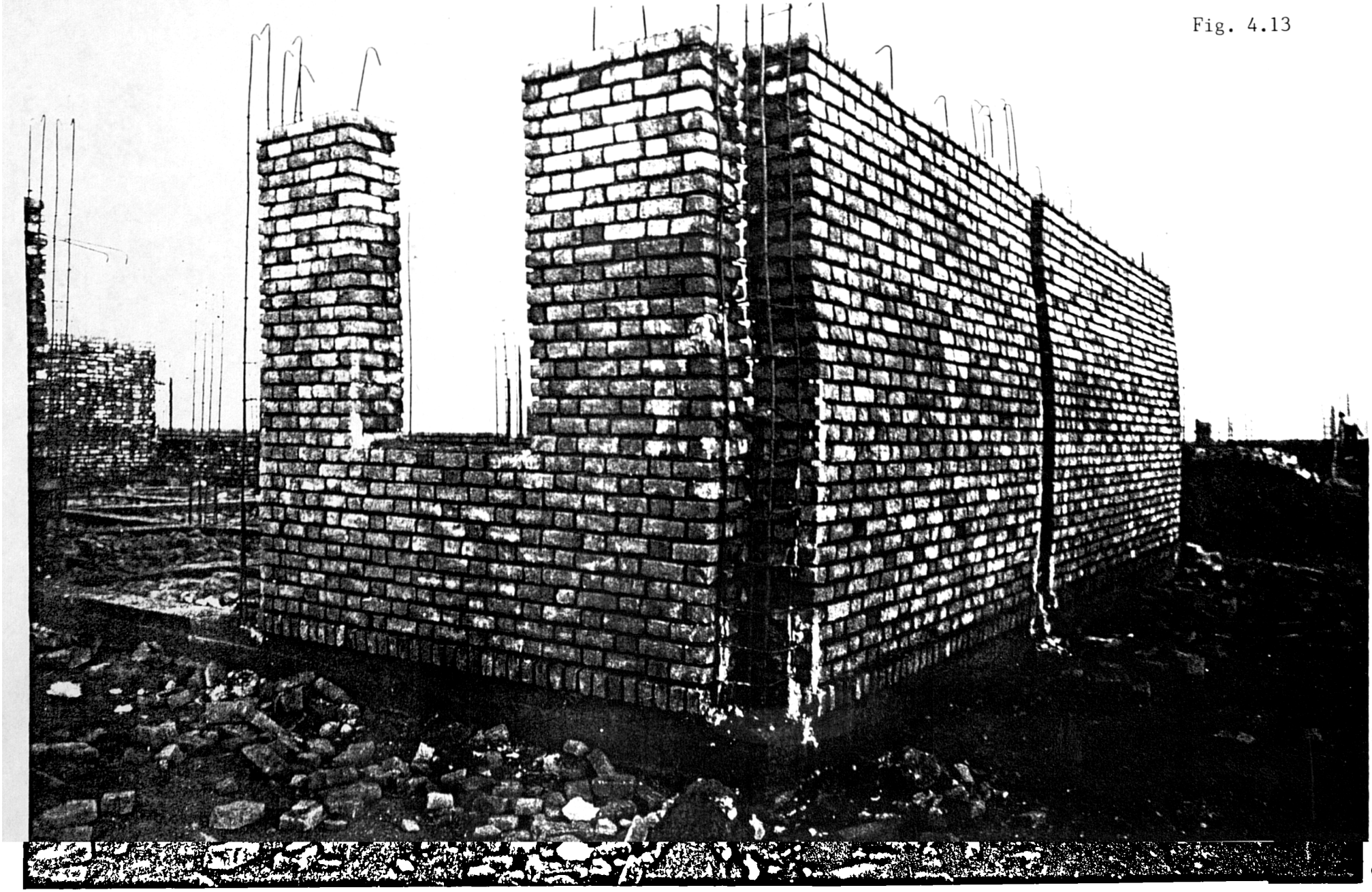
enhance living conditions and to mitigate risks.. The problems of rural areas have been attributed to a disinvestment in social and physical infrastructure and further deterioration caused by the long war and other natural disasters. These factors have created a serious situation that requires new imaginative approaches which could enhance the development of rural areas. The recent reconstruction efforts have introduced sophisticated technology (relative to that which existed prior to the implementation of such programmes) involving the use of new materials and methods of construction producing technically desirable structures but culturally alien shelter (GHANBARI PARSA, 1985). This has resulted in a rising level of expectation and thus a whole process of new construction to the rural areas (Figures 4.13, 4.14 and 4.15). Those officials involved in the reconstruction and other rural development work, who were interviewed, expressed a degree of anxiety about the wisdom of such expensive operations adding that;

> "we notice that even in those areas where safe homes can be built in the traditional way, people have stopped building their homes by such a method despite the fact that they cannot afford the more modern materials or pay the specialist work force to carry out construction". (Maskan va Enghelab, 1986)

The above statement reflects the ideas discussed above that the rural construction process has entered a new phase mainly determined by the new efforts at rural reconstruction. This has brought about a situation where the indigenous methods of construction and materials are being replaced by more modern versions, thus contributing to the serious shortages of such essential items. Furthermore, the rural villages and the dwellings are in need of revitalisation in order to improve their structural strength against natural hazards including earthquakes. It is imperative that any programme regarding the improvement of rural settlements should pay due attention to the revival of economic activities in these areas.

Amongst the major achievements of rural construction since 1979 has been the construction of two large dams near the City of Mashhad (Figure 4.16). The two major hydro-electric projects were partly built for the provision of drinking water for that city, and also to bring more land under cultivation with the development of new irrigation systems (Sakhteman 1989).

Fig. 4.13



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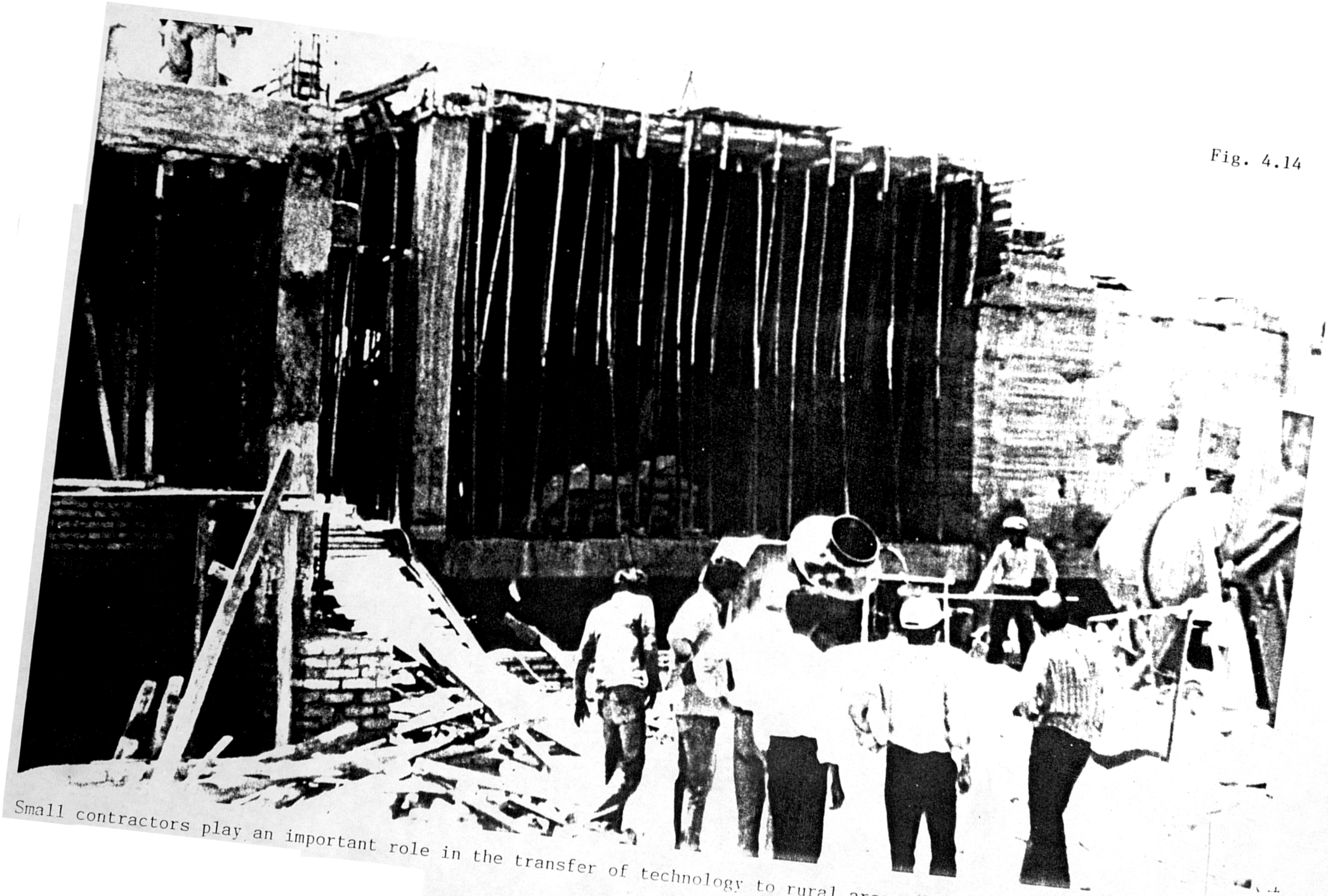
Reconstruction of earthquake damaged villages in Khorasan province. The photograph shows new seismic resistant houses under construction.

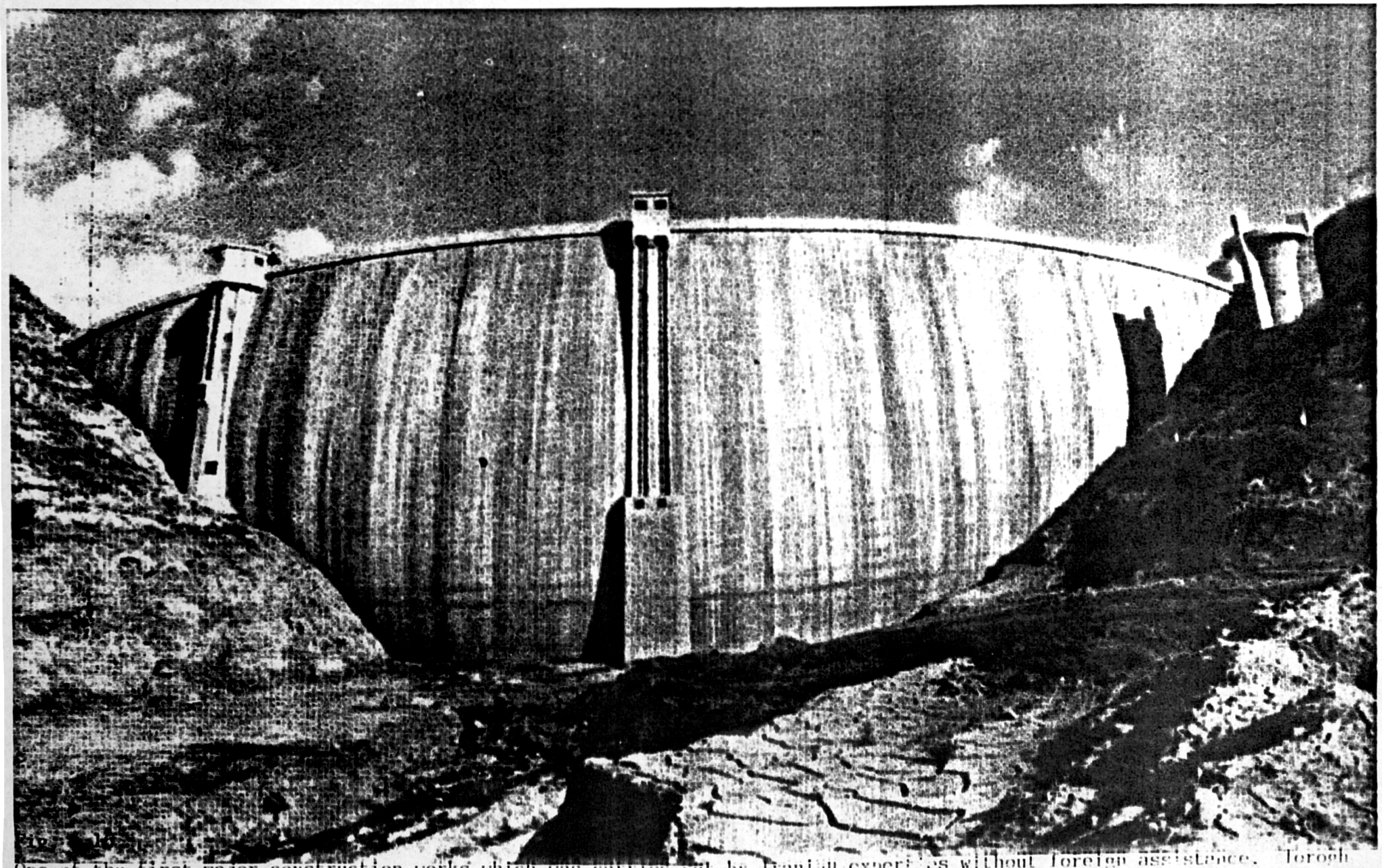
Fig. 4.14



Small contractors play an important role in the transfer of technology to rural areas (Kashmar 1987).



Fig. 4.15
Hoveizeh reconstructed entirely after the destruction by war. The new development has attracted much criticism because of lavish expenditure by the Razavi Foundation which took the overall responsibility for funding and implementation



One of the first major construction works which was carried out by Iranian experts without foreign assistance. Toroqh Dam for the improvement of water supply and irrigation near Mashhad.

With the conclusion of the examination of urban and rural construction and the impact of the planning policies on the construction process, the following section will focus on the analysis of construction resources.

4:5 Construction Resources

Construction industries in all countries need such basic resource inputs as construction materials and supplies, labour of various types and levels of skill, equipment, and finance. The efficient functioning of the industry depends solely on the resources available and the utilisation methods. The discussion on the notion of resources centres around;

I. Personnel; availability of managers, technical expertise, and different types of labour,

II. Materials; production, standardisation and distribution,

III. Equipment; production and distribution,

IV. Investment; sources of investment, methods of investment by both the public and private sectors.

Each of these elements, whilst complementing one another, undoubtedly plays a vital role within the framework of the construction sector. In order to understand the complexities attached to each of the above elements more fully, a more detailed explanation of each element is provided.

4:5.1 Personnel

During lengthy discussions with people involved with both the public and private sector of the construction industry, it emerged that one of the issues which constantly occupied their attention and caused considerable anxiety was personnel - labour and types of labour required by the industry. Probably a great percentage of time, capital and material which is wasted is due to the lack of skilled labour. An example of this is indicated in the report published by the Office for

Human Resources of the Ministry of Plan and Budget, which concluded that, for the production of each square metre of a building in the public sector, 5.4 man-days labour is required against the expected number of 2-3 man-days labour under ideal conditions (1-2 man-days in developed countries) (M.P.B, 1982).

This clearly illustrates the serious state of the labour force in the Iranian construction industry. The above figures indicate the lack of a clear and coherent policy in the employment and utilisation of the labour force in the public sector, supposedly the more sophisticated sector of the industry. It should be noted that although the idea of a labour intensive construction industry has been advocated, yet in a country where there is shortage of expertise, it is important that such resources are used efficiently. The director of a medium size construction company, when asked about the problems related with the work force, responded that:

> "the situation of the work force in our industry can be illustrated as a pyramid on top of which managers and specialist engineers are placed, the bottom section contains the unskilled labour which is abundant, particularly through seasonal migrant workers who come from the countryside. The middle section, which is the most important and should link the two other parts, must be filled by skilled labour or technicians of which there is an acute shortage".

The shortage of skilled labour and technicians further complicates the operation of both the public and private sector. Quite often private companies, especially the small/medium sized ones, train unskilled labourers in the long term view that once trained they can contribute to the success of the business. This is best illustrated by the case of one such company in Mashhad. When asked about the problem of skilled labour, the owner of the company said:

> "..... in the past four years I have trained eight plasterers, brick layers, drivers and machine operators at great expense and with the hope of having a reliable team of workers. But at present only three are still with the company, the rest have joined larger organisations for higher wages that my company cannot afford."

The factors that contribute to such problems include a lack of education amongst the labour force and the non-existence of standard form of labour contract. Quite often this category of workers does not accept a contract for work, and even when such contracts are exchanged, they are difficult to enforce.

In its five year programme for the provision of housing (1983-1988) the government has stated that for the production of 172 million square metres of residential building in the country, a total of 720,000 people were needed in the housing sector, against 480,00 people employed in this sector in 1983 (Table 4.3). However, according to the data released by the Statistical Centre of Iran for the year 1365 (1986-87), this goal will prove difficult to meet.

The construction sector in Iran is one of the largest sources of employment (Table 4.4), after agriculture and industry. This is similar to other countries, and thus requires particular attention, specifically in the post war years. Of the 542,228 university graduates in the country in 1986-87, 50 per cent were science and engineering graduates. As Amirahmadi suggests:

> "This means that the ratio of graduates in applied fields to the total population is very low, 300 per 100,000 population as compared to 5500, 5200 and 5100 for Japan, the Netherlands, and the Soviet Union repectively. The figure for technicians is even more disappointing, 600 per 100,000 population as compared to 25,000 in Japan". (Amirahmadi 1989, p28)

4.5.2 Building Materials

Buiding materials of all types are used in the building process, varying from what can be called "strategic materials" such as cement and structural steel to other structural materials including brick and blocks. Facing materials include stone (marble) and cement-based or chemical-based products. Glass, iron-mongery, wood products, plumbing, sanitary and electrical products, gypsum and tiles also form a major part of the building materials, industry. The production of building materials in general has been in the hands of the private sector, mainly of small companies, but with rapid industriali-

Table 4.3 No of different types of labour needed for the housing programme of 1983-1987.

000's

Period	Labour Type	Urban areas	Rural areas	Country total
1983 (A)	Unskilled	161.7	66.9	228.6
	Semi-skilled	69.9	22.7	92.6
	Skilled	12.0	41.2	161.2
	TOTAL	351.6	130.8	482.4
1987 (B)	Unskilled	169.3	155.3	324.6
	Semi-skilled	93.2	52.6	145.8
	Skilled	152.9	95.5	248.4
	TOTAL	415.4	303.4	718.8
* New jobs to be created (C) C=B-A	Unskilled	7.6	88.4	96.0
	Semi-skilled	23.3	29.9	53.2
	Skilled	32.9	54.3	87.2
	TOTAL	63.8	172.6	236.4

*New employment opportunities.

Source: Ministry of Housing & Urban Development, 1983.

Table 4.4 The number of people employed age ten and above in different sectors of the economy in 1956, 1966, 1976 and 1982.

(000s)

Major Employment	1956 census		1966 census		1976 census		* 1981	
	Number	%	Number	%	Number	%	Number	%
Agriculture etc	3325.7	56.3	3168.5	46.2	2991.9	34.0	2921	34.0
*Industry and Mines	536.4	20.1	1856.6	27.1	2957.2	34.2	2941	34.2
Mine Exploration	24.7	0.4	26.3	0.4	89.9	1.0	86	1.0
Industry	815.7	13.8	1267.6	18.5	1672.0	19.0	1634	19.0
Construction	335.8	5.7	509.8	7.4	1188.7	13.5	1161	13.5
Electr.., Gas & Water	11.7	0.2	52.9	0.8	61.6	0.7	60	0.7
*Services	1754.9	20.6	1705.8	24.8	2720.6	31.0	2731	31.8
Hotel & Catering	355.0	6.0	552.0	8.0	668.5	7.6	..	..
Transportation etc	208.1	3.5	224.1	3.3	431.5	4.9	..	..
Finance & Commerce	..	..	..	..	100.5	1.2	..	..
Social Services etc	455.4	11.1	929.7	13.5	1520.1	17.3	..	..
Miscellaneous	175.6	3.0	127.5	1.9	74.7	0.8	..	..
TOTAL	5907.7	100	6858.4	100	8799.4	100	8891	100

Source: Iran Statistical Centre, Various Annual Reports.

* Data from Ministry of Employment and Social Affairs, Manpower and Employment Planning, Tehran 1983.

sation of production, larger companies have invested in large scale production plants. Much of the new industrialised materials' production method was based on imported technology, especially in the 1965-1975 period. Due to a lack of an effective planning strategy, different systems and methods of production and factories were imported from different countries, which resulted a disorganised materials' production industry, with the result of frequent breakdowns and often expensive products.

After 1979, as the result of the flight of owners of large factories, the production of many materials came to a halt, and in order to end the economic inactivity the present government had to nationalise many factories especially as many had started life with heavy government subsidies and loans. By the beginning of March 1981 a total of 72 large scale materials' producing factories were nationalised throughout the country, producing various materials such as cement, tiles, engineering bricks, prefabricated concrete components and gypsum, until it owns almost all of the large production units either directly or indirectly. In 1981 most of the large building plants were not functioning, either due to the lack of demand for their products or, in most cases, due to breakdown and the shortage of spares or raw materials.

Although the Five Year Housing Programme (1983-88) clearly sets out the amount of materials needed for housing production and the method of achieving these targets, the unavailability of data on the production capacity of various materials' production units around the country make it a difficult task to verify this possibility. Much of the building materials, particularly the strategic types including steel products and cement, were imported. Many factories were set up to produce cement in order to satisfy the demand of the internal market. In 1968 a large steel mill complex was set up in Iran, with the assistance of the Soviet Union, for the production of structural steel and round steel bars came into production in 1972 (Fisher 1988 p400). Aluminium extrusion plants were also set up in the south west of the country. Since 1979 efforts in import substitution have emphasized the setting up of new steel plants and extending the present capacity of the existing plants (Tables 4.4 & 4.5).

Table 4.5 Building materials needed for the production of housing programme 1983-1987.

Programme Years	Steel 1000 ton	Cement 1000 ton	Bricks No Billion	Gypsum 1000 ton	Glass Million m
1983	671	2852	9.16	2420	4.89
1984	730	3221	10.16	2740	5.46
1985	779	3670	11.16	3040	6.12
1986	847	4145	12.39	3430	6.85
1987	908	4697	13.57	3900	7.66
Total	3935	18585	56.44	15530	30.98

Source: Ministry of Housing & Development 1983.

4.5.3: Equipment

The availability of equipment in the construction market to some extent dictates its use. Although the more sophisticated projects require more use of equipment, at present in the Iranian construction industry, it is the larger contractors and the government departments who can afford to pay for the capital cost and maintenance expenditure of such equipment. The presence of a black market in construction machinery, equipment and plant which has pushed up the cost of such items beyond the reach of most small operators, stems from the reduction of imports, a lower production capacity of the domestic manufacturers and the high demand of the war effort. The production of construction machinery and equipment has been carried out under licence from foreign companies for some time. However, in recent years production of some less sophisticated machinery, such as concrete mixers, dumper trucks, lift trucks and some earth moving machinery, independent of imports, has started to the point of self sufficiency (Table 4.5), (B.O.T.B, 1983).

With limited supply, the price of essential construction equipment such as concrete vibrators, concrete pumps, mobile generators and similar items has increased significantly to a point that many contractors who bid for work do so in the hope that they can get permits for the allocation of such equipment, which is of high value and may be sold on the completion of their contracts. Lack of technicians means that maintenance causes added difficulties. At present all contractors who win work contracts from the government gain access to machinery and equipment according to their needs and the requirement of the project at an official price which is considerably less than the free market value. On the government side all their departments get a share of such essential items. The continuation of the war has meant that a large proportion of the available items have been were diverted to the war front. Even private companies' machinery, such as earth moving machines, bulldozers and trucks have been required for the war for 45 days every six months, free of charge, under the control of the government, who only pay the salary of the driver.

Prior to the outbreak of the war there was a flourishing equipment hire market, but this has become less profitable due to the shortage of spare parts and the high cost of maintenance. At the same time, hiring equipment is a costly venture for

the small operators, thus adding extra pressure to their operation. This is an area dominated by the private sector which under normal conditions can provide a good and efficient service. The public sector is bound to play an important role in the provision of such items in the smaller towns and rural areas where both the demand and availability of such equiment is limited. In this case the public sector offers a hire service to the local community and the instances of this system of operation is plentiful. Like the production of strategic building materials the government tends to be the only source of investment in the production of construction equipment and machinery. Even in the 1970s, when large private companies had more freedom of operation, they did not show much interest in directing investment in the production of equipment: they preferred to import such machinery and act as distributors (M.H.U.D 1985, pp6-7), (Diagram 4.4 and 4.5). Despite the high cost of equipment it seems that the use of small specialist equipment such as concrete mixers, vibrating machines and similar apparatus has increased amongst the small operators, which can be seen as a positive development in producing better quality work.

4.5.4: Investment

The procedure for the financing of production in construction is unique compared with other industries. In a capitalist economy production can be financed by the producer's entrepreneurial capital or short-term bank loans. By this method production is independent of the customer and product. In construction, however, the production of a specific facility is largely financed by the customer rather than the manufacturer (Moavenzadeh et al 1975, pp28,29), by periodic payments during production, particularly where the private sector is concerned. In the past constructionin Iran was almost exclusively undertaken by the private sector in the 1970s (Spillane 1974, pp 96-97). This is still true; as a general rule it is declared government policy to use private contractors for public projects. The capital formation in construction is largely by the public sector, the private sector being at present reluctant to make long term investment. Also, due to the fact that the government in Iran, like other developing economies, is the sole earner of foreign exchange through the export of oil, it tends to be the major source of investment.

Diagram 4.4: Share of private sector in capital formation between 1961 and 1983.

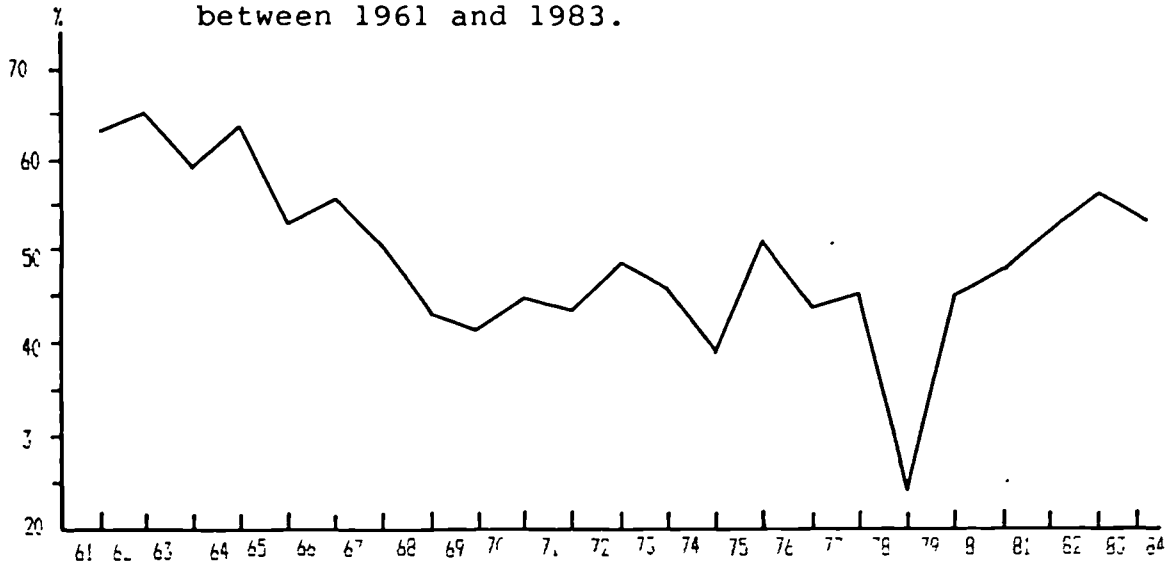
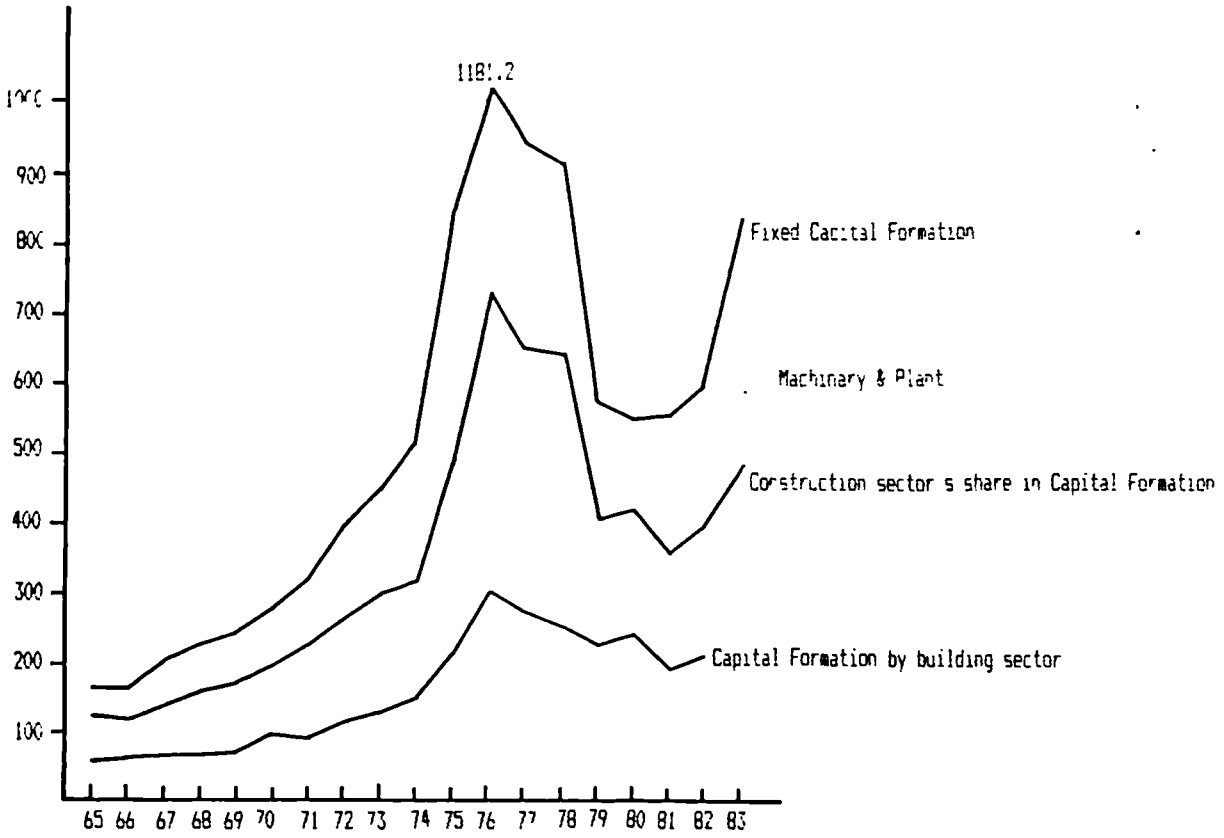


Diagram 4.5: Gross National Capital Formation, Capital Formation in Construction sector and building group, between 1965-1983.



Source: Bank Markazi Iran, National Accounts, 1959-1977, (1981), and Economic Statistics, 1973-1977, (1985). Iran Statistics Centre, Annual Report, 1983, (1984), Tehran, Iran.

In the aftermath of the revolution, the share of the public sector in construction investment declined rapidly (Table 4.6, Diagram 4.4 and Diagram 4.5). At the same time the share of the private sector investment in housing increased. This presents a source of conflict, especially when the fall in government investment in construction indicates the reduction of government activity in the public works programme, and more specifically, the provision of physical infrastructure. On the other hand, with the reduction of private sector investment in machinery and equipment previously undertaken by the public sector, investment has been directed at the housing sector and speculative development.

In the twenty year period 1965-1985, out of all the investment in construction 90% was in residential buildings, while investment in construction formed a major part of gross fixed capital formation. In the period of 1971-80 construction formed 27.8% of the fixed capital formation, increasing to 39.1% between 1979-85 whilst the share of the construction sector and its value added in the gross domestic product prior to 1979 averaged around 4.2%. In the years after 1979, although investment in construction increased, its share of the gross domestic product not only did not increase but also was reduced to 4.1%, based on constant prices (M.H.U.D 1985, pp 6-7).

The specialised character of each section of the construction process, the project-oriented nature of production, seasonality, and the industry's susceptability to economic fluctuations and demographic influences, all combine to make construction demand inherently unstable. Public policy in Iran, as in other countries, often tends to augment this instability, particularly with regard to the unstable economic environment, and war oriented projects further exacerbate the problem. The role of government in construction in Iran is important and varied. Governmental departments (such as transport, communications and health, education, and welfare, along with the major public utilities) concerned with construction are frequently well staffed and technically sophisticated, often not only having their own design teams but also their own construction teams. The government influences the price and availability of certain materials and thus the type and technical sophistication of construction by owning and operating major construction materials' manufacturing plants. By providing preferential treatment (Moavenzadeh et al 1975, p35) to a particular

Table 4.6 Gross Fixed Capital formation in construction and equipment and the private sector share of each sector between 1965 and 1984.

(fixed price, *1000 million Rials, percentage).

YEAR	CAPITAL FORMATION in CONSTRUCTION SECTOR *	CAPITAL FORMATION by private- * sector in CONSTRUCTION	SHARE %	CAPITAL FORMATION in Equipment & Machinery *	CAPITAL FORMATION in Equipment by private sector *	SHARE %
1965	124.2	58.8	47.4	42.1	28.8	68.4
1966	119.3	60.8	60.0	48.7	32.5	66.7
1967	145.4	62.9	43.3	66.9	43.9	65.6
1968	164.8	63.8	38.7	71.4	37.7	52.8
1969	175.4	69.1	39.4	79.4	36.3	45.7
1970	201.8	87.3	43.3	84.2	41.9	49.8
1971	232.3	86.7	37.3	102.6	58.3	56.8
1972	276.6	107.7	38.9	134.0	94.3	70.4
1973	312.9	120.8	38.6	150.4	90.5	60.2
1974	336.7	124.7	36.8	192.8	81.8	42.4
1975	472.7	178.1	37.7	401.9	269.4	67.0
1976	740.1	244.7	33.1	441.1	278.0	63.0
1977	655.2	246.2	34.3	427.9	224.8	52.5
1978	647.2	218	33.7	281.1	62.6	22.3
1979	410.7	217	52.9	165.3	42.1	25.5
1980	425.8	230.6	54.2	128.0	33.0	25.8
1981	368.4	175.1	47.5	194.4	78.2	36.2
1982	402.8	186.7	46.3	215.7	53.1	24.6
1983	485.5	262.5	54.1	374.1	197.2	52.7

Source: Bank Markazi Iran, 1985.

sector of the construction industry in its roles as financier and policy-maker, the government also substantially affects the distribution of available manpower in the industry and increases the tendency for technological innovations in that area. At present the private sector involvement in construction is on a small scale; large scale investment awaits the end of the war and economic stability.

4:6 Conclusion

This chapter concentrates on the role and contribution of the construction industry to national development, the impact of planning on the construction industry, and the impact of political and institutional factors on the construction process.

This was achieved by:

a. an analysis of the performance of the construction industry both before and after the 1979 Revolution,

b. the analysis of the planning process and the impact and outcome of physical development programmes, and

c. the examination of the role of the Government in the construction process.

The situation of the construction industry in Iran and the identification of major factors involved in the construction process at first glance can be seen as similar to that in many other countries. However, with a closer examination, it becomes apparent that due to various political, economic and physical factors the Iranian construction industry faces extreme difficulties. Whilst there is much demand on the industry, this is further aggravated by the diminishing resources and lack of investment. Despite the fact that the private sector has traditionally played an important role in the development process, due to a shortage of essential resources it has become entangled in a flourishing black market for such requirements. The same process occurred in the planning and implimentation of Abuja (AJ 1985). The major actors in the construction industry, ie, the government, the source of investment, the private sector responsible for implementation, and finally the informal sector being a major source of small scale activity, are all dependent on each other. The relationship between the state and the construction sector in Iran seems to be different at present to the years prior to 1979.

The previous administration encouraged the creation of a powerful private sector heavily involved in real estate development. Whilst the prevention of speculative investment at present can be viewed as a positive development in order to weaken the influence of powerful developers, at the same time

it is imperative to have a well developed private sector involvement in the construction industry whose activities can be controlled by the state. In order to develop the industry, various divisions of the construction sector need to be examined. These include the building materials' production and distribution sector, the equipment supply market and, most vital of all, effective training of skilled personnel both at technical and managerial levels. Private construction firms are an important part of the construction process which need the support of the public sector both legally and financially. As Wells (1986) states, the construction industry in developing countries today does not appear to be fulfilling its full potential role in economic growth and development. Our problems in Iran at present seem to be both organisational and procedural. The lack of such institutions is an obstacle to future development and reconstruction. As noted previously, the existence of too many parallel organisations has often led to duplication of work and wastage of valuable resources. In arguing this point Amirahmadi states:

> "The latter include the Ministry of Agriculture vs the Ministry of Reconstruction Crusade, the Ministry of Housing and Urban Development vs. The Housing Foundation and Housing Organisation, interest free loan institutions vs the banking system, management of the universities vs the Council for Cultural Revolution and other grass root organisations." (Amirahmadi, 1989, p30)

In the implementation of projects, particularly in the post war reconstruction, some organisations such as Razavi Foundation (Astan-e Ghods-e Razavi) challenge the role of the Government (Ghanbari Parsa, 1988, p10 and Amirahmadi, 1989). One of the latest organisations to emerge in the post war period, is the Council of Policy Making for Reconstruction which is duplicating the MPB's function in drawing a plan for the reconstruction of the country's economy. This is the most vivid example of conflicts and duplication which will have a disastrous impact on the availability of planning experts in post war Iran.

Whilst there is a genuine goal on the part of the government for self-sufficiency and technological independence at the same time, there seems to be a piece-meal approach towards the industry. The private sector at present does not trust the government in order to invest in capital formation projects.

There are gaps within the legal system concerning the status of the companies and the labour laws. As a result of all of the factors listed above plus the inadequate equipment, and the poorly developed transportation network, the construction industry in Iran is inefficient with low levels of productivity and high costs. With this in mind it was decided to carry out a survey of a number of construction firms in order to discover issues which constrain the efficient running of business and to search for appropriate possible remedies. This will form the next section of this thesis.

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CHAPTER 5

5:1 Introduction

This chapter reports on a field survey of construction firms conducted in the Khorasan region of Iran during March and April 1988. The intention was to shed empirical light upon the central theme of this study: the interactions between planning development implementation processes. Thus the chapter starts with a brief account of the reasons for conduct of the survey, the relevance of the survey to the objectives of the research, the design and distribution of the questionnaire.

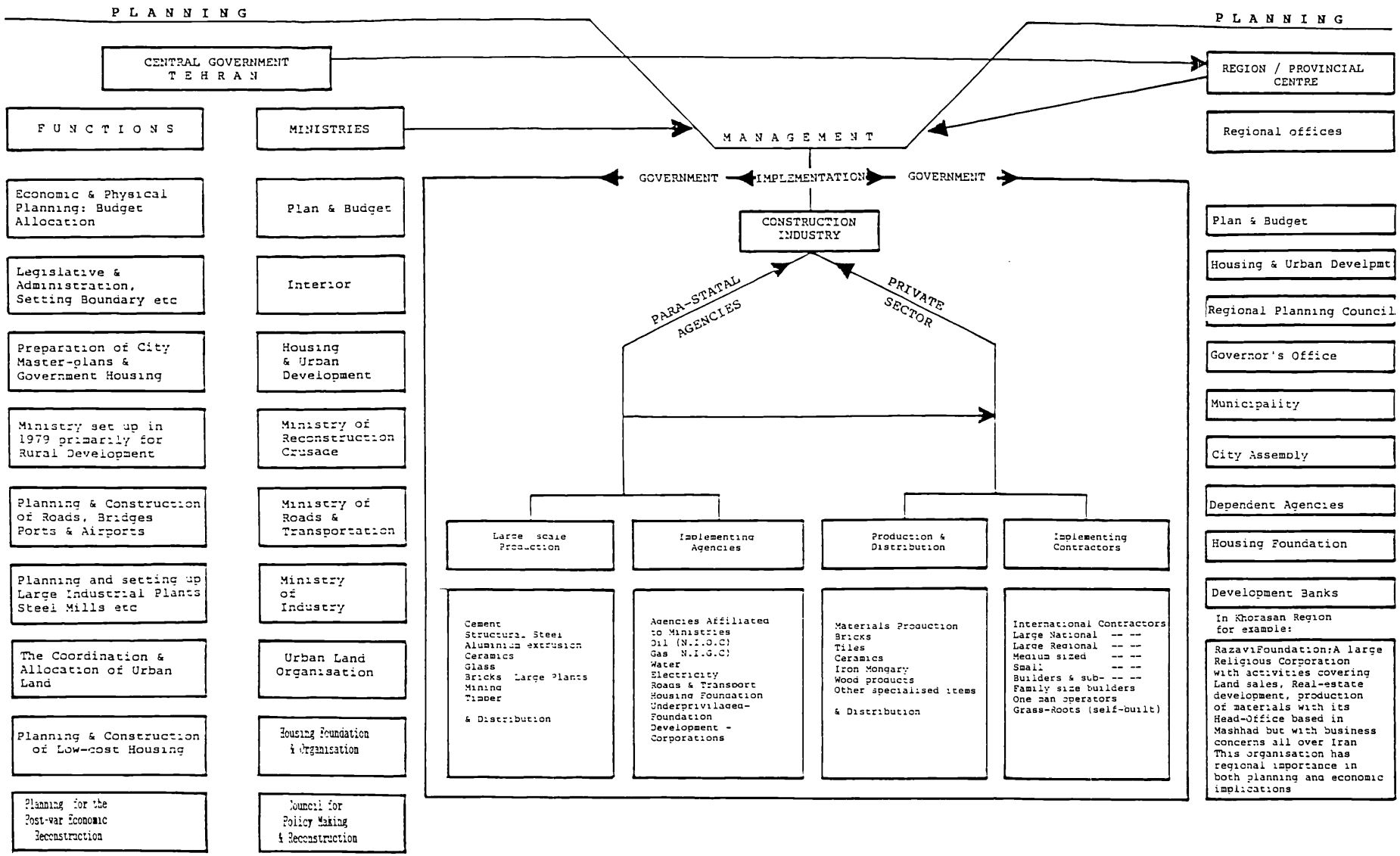
The main objective of the chapter is to identify constraints to the function of private construction companies. This is so that an assessment can be made of just how much flawed relationship between government planning and construction industry policies can be blamed for the constraints identified.

5:2 The Rationale

One of the most commonly used research methods by social scientists is based on survey. Survey involves the collection of data on a variety of subjects such as samples of populations, firms or activities either by questionnaire or less structured interviews. There is already extensive literature on research methodology and survey techniques, therefore it is not the purpose of this chapter to present further information on this subject. In the context of this study, the research techniques employed have been a combination of field research and participant observation method. This part of the study comprises the result of a questionnaire survey of a number of construction companies in Khorasan Province of Iran.

An important link in the construction process is the construction firm. Diagram 5.1 summarises the Development System in Iran already reviewed in Chapters Three and Four. The private sector's role in the construction process as indicated by the diagram is not clearly defined due to the complexities of the post revolution political environment. The private sector involvement in the

Diagram 5.2 THE DEVELOPMENT SYSTEM IN IRAN



construction process is particularly profound in implementation stage and production and distribution of building materials. The growing importance of the role of para-statal agencies in the development process is indicated by the diagram. These agencies which function along the lines of private construction firms are in effect planning and implementation arms of the major ministries or government organisations.

The survey of construction firms in this part of the study complements the earlier work presented in Chapters Three and Four. During earlier field research in 1986 and 1987 for the study of planning and construction processes a number of construction companies were identified. This was part of the overall research strategy to use these companies as samples for the conduct of a survey. The objective was firstly to establish the method of operation and the extent of the dependency of these firms on government actions. Secondly these companies formed the basis for the study of the process of construction technology transfer in the urban-rural context. The account of this investigation is presented in Chapter Six.

5:3 Methodology

Surveys are the fastest way of data-gathering but necessitate lengthy preparation procedure. The preparation process entails identification of sample, decision on the method of conduct, design and distribution of the questionnaire or arrangement of structured interviews. A great number of researchers employ surveys for the conduct of research. In asking too many questions and processing answers by computers, a number of surveys are in danger of being perceived as mere 'number crunching exercises'. Also there are other problems which have been associated with survey research. As the investigator designs the questionnaire and formulates the questions, the gathered data reflects his interests. Further as Chabbi (1988) states 'the mechanical nature of survey, in the way that it usually presents people with statements and consists of finding the number who agree or disagree with these' can cause concern. It was not the aim of this survey to merely present a set of data as an indication of empirical evidence to support the research. It was designed to collect information in order to identify constraints and to clarify some problems associated with the process of planning, construction and implementation. The strategy adopted for the conduct of survey was based on the use of questionnaire. In the analysis of

the questionnaires and summing up the survey findings it was decided against a synthesis of survey results and expert opinion. By outlining the survey finding in a distinct format it was intended to provide a platform to reflect the respondents' views.

5:3.1 The Relevance of the Questions Posed in the Survey

As stated in section 5.2 a number of construction firms identified during earlier visits were used as the main survey sample. The choice of firms was based on the fact that they were already operating in Khorasan province and the type of their projects. They also had formal status thus representing typical formal sector construction enterprises. The main questions were formulated after consultation with a number of practitioners, engineers, architects and officials of the local government departments. The Author's extensive background working with a number of construction firms and knowledge of the construction industry at national and regional level was particularly useful in the design of the questions. The questionnaire was further tested of a number of people with knowledge on the use of questionnaires and experience of the Iranian construction industry. As a result of this presentation the questionnaire was modified to reflect some of the criticism and recommendations.

The questions were constructed to reflect the key issues raised in the research objectives. The objectives were to investigate the interactions between planning and construction, by evaluating the role and impact of government in the construction process and to illustrate the role of private construction firms in responding to construction demand. To achieve these aims six main questions were constructed. each question contained a number of sub questions to assist the respondents in completing the questionnaire.

Question One was designed to provide information on the nature of activity of the firms. Question Two concerned the size of the companies, their status as recognised by the Ministry of Plan and Budget and location of their operation. This was to determine how many of the firms were actually based in the region. Question Three related to the type of projects the firms had taken on. A classification of projects was available in order to illustrate the degree of sophistication of each company. The type of projects carried out by each company provided a basis to deter-

mine the technology and the likely type of materials used for the implementation. This would also help demonstrate the impact of government action on the adoption of construction technology and resources. Question Four was devised to collect information on the type of client. This would not only indicate the source of investment but also show the extent of government involvement in planning and construction process. Question Five was included to determine what other actors were involved in the implementation of projects. Part a of Question Six was designed to identify constraints that private construction firms faced in the conduct of their business. Part b of Question Six was intended as a basis to reflect the views of the private firms regarding tangible solutions to overcome constraints to the effective function of the construction industry.

5:3.2 The Survey Conduct

The conduct of the survey was based on the distribution of the questionnaire amongst the firms by an exploratory first visit. During this visit, an appointment was made with the company director for a later date to conduct the survey. The typical Iranian company director is not accustomed in giving interviews and is not usually subjected to surveys compared with firms in the U.K. Due to this fact, it was necessary to conduct the survey along the lines of a structured interview. It was necessary to spend a few minutes to explain the nature of the survey, its purpose and its contribution to the research and also to overcome fear of it being a government sponsored investigation. This survey strategy proved particularly potent in maximising the respondent contribution to the survey.

The timing of the survey and the prevalent circumstances during the war had unexpected implications for the survey. Firstly the timing of the survey in March-April 1988 coincided with the war of the cities during the last phases of the Iran-Iraq war. The implication of this factor was that many people were displaced and was not possible to contact the directors of firms both in Teheran and Mashhad. For example it was not possible to approach the Contractors Association in order to get an up-to-date list of contractors. Further the Ministry of Plan and Budget had other priorities to consider and therefore their personnel were not in a position to provide information on firms.

Secondly, the economic inactivity and stagnation of the construction industry had a major impact on the size of the survey sample. As mentioned in the previous sections, in earlier visits a number of firms were identified as target for the survey. As a result of the substantial drop in construction orders and government's inability to proceed with the implementation of development programme many firms have simply disintegrated and thus ceased to function. This factor undermined the survey in curtailing the number of firms dramatically.

5:3.3 Scope and Limitations of the Survey

As stated earlier the scope of the survey had to be narrowed partly by choice and partly by circumstances. Thus questions arise regarding the size of the survey and whether it is a valid size to merit serious consideration. Further it could be argued, how representative the sample firms are of the overall Iranian and Khorasan based construction firms. This survey was carried out in difficult conditions, i.e. during the "war economy". It could further be argued that the survey finding only reflects the conditions of a war economy and not the normal conditions.

To counter such criticism it should be noted that the sample size of 50 (41 confirmed responses) represents a respectable size because of the diversity of the firms and the type of the projects they carried out. In connection with the validity of Khorasan province in representing the wider Iranian perspective, during the war years Khorasan province was the most economically dynamic regions of the country. This was due to two factors. Firstly, Khorasan was far from the impact of the war in physical terms, subsequently it attracted much capital from other regions in the country. Mashhad the provincial capital and the second largest urban centre in Iran is a major centre of commerce and light industry and has seen major economic growth during the war. Secondly as most of the government ministers are Khorasanies then a measure of patronage has prevailed. The result of this has been the channelling of funds into a number of development projects. Thus Khorasan field survey does represent what could resemble as normal conditions.

Although the end of the war is a positive development, it is the author's opinion that conditions will not improve immediately. Indeed the war has merely intensified some of the problems but such problems are not created only as a result of the war. Even

more than a year after the end of the war, not only the shortages of construction materials not diminished but also the economic conditions have deteriorated further.

5:4 Construction Companies: The Context

This chapter continues the examination of the organisation of the construction industry at the level of the firm. As stated above the rationale is to study the way firms of various size function and more importantly how much they rely on government investment for survival.

Construction firms can be categorised as; small, medium and large. As the structure of economy and policies of development changed in the aftermath of the 1979 Revolution, there has been considerable transformation in both the constitution and operation of private firms. The immediate impact of the new political and economic order was the disintegration of the majority of large companies and flight of capital and human resources. In Iran as in other countries larger firms tend to take on larger and more sophisticated projects in and around the main urban centres or large trunk roads and hydroelectric schemes in inaccessible areas. Larger firms are more dependent on public sector investment and thus more susceptible to economic change.

The impact of the new system on the smaller construction companies has been mixed. On the one hand a large number of such firms disappeared over-night as a result of disinvestment in development projects. At the same time the government favours smaller construction firms due to political considerations. It is this aspect of the development process that this survey is designed to address. Small contractors or construction firms are powerful generators of income and employment, often with less capital investment per job created than larger firms (ILO 1987, pp13-17). Small contractors often show willingness to undertake small geographically dispersed construction projects. Traditionally all public works have been implemented by private contractors through tendering. By taking on small geographically dispersed schemes including; low-cost roads; schools; rural health centres and similar projects small firms often have a major impact on the national development programmes. Despite such an important role small firms do not receive sufficient government support and recognition. The survey identifies such institutional and procedural constraints.

5:4.1 The Profile of a Typical Construction Firm

This section provides a profile of a construction firm currently operating in Khorasan. The firm typifies a formal construction company with MPB recognition. The method of awarding formal recognition by the MPB is explained in the following section. Building firms can be classified in a variety of different ways (Ball 1988, p42). The conventional classification of firms is often based on size and the physical type of work they do. Ball uses two criteria that characterise the social structure of the firms and the construction industry. The first is the economic organisation and the second relating to the types of market structure in which the firm operates (Ball 1988, p42). In the first scenario it is important to determine whether the firm operates on capitalist criteria, and the second scenario refers to the involvement of the firm in speculative or contracting market.

The firm was founded in the immediate aftermath of the 1979 Revolution falling in Ball's second category of construction enterprise i.e contracting firm. In 1979 the director was a fully qualified Civil Engineer with nearly 10 years of experience working with the largest Iranian construction companies. The company was set up as a contracting firm working on small scale government projects including; schools, health clinics and small road works in Khorasan. Although the company was set up as contracting firm it was also engaged in other activities including property speculation and some production of building materials. During the 1980s the firm continued its work on some government contract in remote areas. The number of employees working on contracts naturally fluctuated according to the number of contracts the organisation was involved at any time. The type of personnel varied from other graduate engineers, technicians, administrative staff to manual workers and specialist operators (drivers, concretors, brick-layers, joiners and plasterers). This number at one time reached 200. Also depending on the type of particular contracts, works of specialist nature were always sub-contracted. Despite this practice the firm was always held responsible with obtaining the necessary components and the quality of the sub-contracted job.

The frustration of working on government related contracts due to bureaucratic headaches and delayed payment drove the firm to near bankruptcy by 1989. As a consequence, the firm had already stopped working on government related projects altogether in 1987

and would only take on non-government contract work. At this stage the number of employees dropped to around 30. Working on private sector financed projects has also been troublesome. Firstly, there is too much competition from other contractors thus making it impossible to undertake any worthwhile contracts. Secondly, lack of building materials and the existence of a black market for every item of building components has made operating as a construction firm almost impossible. Currently the company is only involved in property speculation.

The firm's struggle to survive is not solely due to the war situation. It is mostly because of the way the construction industry is organised. The government whose support is most paramount for the survival of such firms is in effect the major obstacle. The company's problems are not unique, they portray what the majority of small construction firms in Iran face.

5:4.2 The MPB's Procedure of Recognition of Construction Firms

The M.P.B has a mechanism for dividing the construction companies into major categories of works done. These include, buildings, road construction and infra-structure (bridges, tunnels etc), building services (pipelines, gas, water, heating & ventilations) electrical installations, drilling, metal building (framed structures), and earthworks (canals, small dams, etc). Table 5.1 contains the number of registered construction firms in Iran in the early 1970s, according to the type of work which they undertook. This number has been reduced dramatically since 1979. Table, 5.2 although now out of date, still illustrates the diversity of work undertaken by most construction firms in Iran.

Classifications are given by the technical bureau of the M.P.B and are listed according to special ratings for each category. These ratings are based on the following:

I) the academic degrees and experience of the manager or the owner of the company,

II) past performance and projects undertaken,

III) capital, equipment and machinery owned and the number of technicians or engineers employed,

IV) the major specialism.

Table 5.1. The number of registered construction firms in Iran by type/s of work in the early 1970s.

Type of work	A	B	C	D	E	F	G	H	I	TOTAL
A. Roads	5	158	1	-	-	-	-	-	-	345
B. Buildings		36	-	18	-	-	2	1	-	403
C. Bridges			-	-	-	-	-	-	-	24
D. Pipelines				-	-	-	2	-	-	174
E. Electrical Installation					9	-	-	31	-	45
F. Drilling						9	-	-	-	9
G. Metal Building							2	-	-	39
H. Heating & Ventilation								5	-	37
I. Earth Work									-	84

The firms which are listed in the table carried out only one or two types of work.

Table 5.2. Registered construction firms in Iran by the number of types of work in the early 1970s.

1.	Only one type of work	67
2.	Two types of work	205
3.	Three types of work	104
4.	Four types of work	59
5.	Five types of work	16
6.	Six types of work	2
	Total number of registered firms	469

Table 5.3. The number of registered consulting firms in Iran in the 1970s by types of work.

1.	Architectural & Planning	34
2.	Civil Engineering	26
3.	Agricultural and Irrigation	9
4.	Mechanical and Services	7
5.	Mines and Industry	8
6.	Others	5
	Total number of registered consulting firms	89

Source: Plan and Budget Organisation, 1970.
(Cited in J. Spillane 1974, pp98-100).

The companies are thus rated to form the basis upon which they can compete for government works and the maximum value of a contract they can undertake in one year. When the tenders for various projects are presented, they are examined by government consultants (the relevant department/client) and a successful bidder is recommended to a committee. It is important to mention that the acceptance of a bid is not necessarily based on the lowest bid; this is partly because some contractors, when faced with a shortage of work, would submit a low bid in order to get the work for obtaining equipment which they can sell on the free market. As illustrated by Diagram 5.2, a great deal of attention is paid to the experience and professional merits of people concerned with the formation of a company.

5:4.3 The Contract Procedure

As a general rule private contractors bid for all public works programmes in Iran. The system of tendering is similar to that of the market economies. This means that, after the designs have been essentially completed, either all contractors (in the case of "open tender") or a number of specially selected firms (in the case of "selective tender") are invited to submit a price for which they will undertake to complete the whole of the work involved in the construction of the project. Contracts are awarded by competitive bids; bids are invited from a group of contractors chosen by a committee of officials from the M.P.B and the government department involved. The bid may be in the form of a 'lump sum', on the basis of close scrutiny of the drawings and the specifications or it may be in the form of an agreed 'schedule of rates'. A new method bidding currently practised involves the invitation of contractors by the client (the government) to bid on a percentage above or below a particular price index for the year specified by the client on the estimated sum of the contract value.

5:5 Survey Results and Findings

The SPSS-x package of programmes was used for the data management and analysis of the survey result. The survey data was constructed by using the standard questionnaire designed for the survey (Appendix 9).

Diagram 5.2: The method and conditions of recognition and determination of group and rank of a building contractor by the Ministry of Plan & Budget.

conditions for recognition & determination of status							Form No 105
Specialist Field: Buildings							Group 5
Status of director & board of directors & limit of their share holding							
order	Profession description	experience year	no of	points	% of share Min	% of share Max	Remarks
1	Civil Eng/ Arch	10	1	426	17	25	
2	= = =	5	1	363	15	21	
3	Building Technician	10	1	302	12	18	
4	= =	5	2	257	10	15	
5	Diploma	10	2	214	8	13	

Min members in the board of directors 3	Min points for the board of director		Min Capital of the company 000's Rls 4200		
Director's status	profession		experience		Min points
	Civil Eng/ Arch		5 yrs		263
Rank	points	2033	2100	2167	2236	2309
	rank	1	2	3	4	5
Determination	Max contract value	360,000	420,000	500,000	700,000	800,000
	contract duration	24 mths	24 mths	24 mths	30 mths	30 mths
	Max work/yr 000' Rs	180,000	210,000	250,000	280,000	320,000

Source: The Ministerial Declaration on 20th April 1983, M.P.B.

As to the question of the validity of the survey results, the traditional approach to assessing of the validity of survey data has been to compare the data themselves, (the products of the data-construction process), with standard values, values that are regarded as true or the norm. To the knowledge of the author, there is no other such survey with which to compare the results of this survey. The last comprehensive study on the Iranian construction industry was carried out by the International Labour Organisation published in 1973. Other reports published in mid 1970s were merely a collection of some statistics to provide market intelligence for western construction companies.

The following sections will provide a more detailed analysis of each question and the variables. As can be seen in Appendix 9, each question consists of a number of variables that the respondent answers in the majority of cases by a tick, apart from the few cases where they have to write numbers or give a Yes or No answer.

5:5.1 Question One

The first question was constructed and worded as "THE TYPE OF COMPANY", seeking information concerned with the nature of business that the companies were mainly engaged in. The aim was to find out to what extent these contractors were involved in other activities as developers, consultants or other. It is important to point out that the survey did not include consultants except those named by the MPB as Building and Construction Companies. Therefore some of the sample carry out consultancy or are engaged in the production and distribution of materials as well as contracting. Specialist contractors were also excluded. For example, of the 41 companies which were surveyed, 37 (90.2%) of them were operating as developers. In the following tables it can be seen that a number of these companies also carry out other activities, including eleven which are engaged in consultancy, seven in the production of building materials. None of the respondents were involved in the distribution of materials. This could be seen as the result of government control over the distribution of building materials and components.

5:5.2 Question Two

Question two concerned more specific information on the companies, including the number of years that they have been operating, their Grade as determined by the M.P.B, and the number of their employees, which would indicate their size.

5:5.2.1 Years in Operation

The majority of the companies have been operating for between eight and twenty years. Only four companies are less than 6 years old, while five exceed 20 years of which two have been operating for thirty-five years. The conclusion that can be drawn from this result is that because of the economic stagnation many of the firms which were set up prior to the revolution in 1979 have ceased to exist. At the same time, those which started their operation in the 1970s or the early 1980s have survived; this might indicate the level of the professional experience of their owners.

It became clear that the companies which had been operating for 35 years were amongst the larger construction companies prior to 1979, which had been nationalised, but in the early 1980s the ownership was returned to the former directors who had decided to return from exile. In fact they have carried out a number of large contracts, as there are few remaining larger firms. The regional operational manager of one commented that:

> "This particular company was a large partnership which was established in the mid 1950s. Prior to the revolution the company was involved with the construction of a number of national projects, some of which were carried out in joint ventures with expatriate companies. In 1979 the company was taken over by the workers and subsequently was nationalised in the early 1980s. Four years later the company was returned to the previous owners. The company is once again expanding and is currently involved with a number of large projects."

5:5.2.2 Company Grade

In the earlier section of this chapter (5:2), the process of setting up a company and the way in which companies are class-

ified by grading determined by the Ministry of Plan and Budget was described. Prior to the survey it was assumed that all the companies were graded and officially known by the M.P.B, but the survey reveals that a large number, thirteen out of forty one, do not have a grade. Whilst some of these are smaller operators, a considerable number are amongst the larger companies. This is of particular interest as, when they were further questioned about the education of the owners or those in charge of the firms, it appeared they were not qualified engineers or did not have any significant education. As can be seen in the majority of the companies are of Grade 3, forming 34.1% of our sample.

Further investigation into the relationship between different variables could also be relevant to the research. It was mentioned in section 5:2 that the grading of the company determined the extent of the contract value that different companies could bid for. In practice however, this does not necessarily apply. For example, a number of companies were carrying out larger contracts than they were supposed to do. In one case the company director mentioned that;

> "Because of the long standing contacts with the local Department of Housing and Urban Development, the company is rewarded with contracts significantly higher than it is supposed to bid for"

The educated and professional company directors often have a hostile attitude towards some of the companies which do not have any grading at all. These feelings were reflected by one such director. In his opinion;

> "In such cases, at least in the local context, the owners of such companies are widely known because of their influence. Thus the award of contracts to such companies reflects the extent of the local influence of the owners".

5:5.2.3 Company Size

This variable was included in order to construct some data about the number of people employed by the different firms. However it is important to note that because of the nature of the activities

of most construction firms, the number of their employees (even full time staff) depends very much on the number and type of projects at any particular time. In one particular case, the company was operating in four different cities simultaneously. The number of people employed differed through time. At one stage of the firm employed around 200 people. Although most were temporary, some of them were on long term contracts, thus it is safe to assume that the number recorded in this survey represents the number of full time staff. The results show that 25 of the firms, comprising 61% of the sample, employ less than ten people; therefore the majority of the respondents are small companies. In addition there are also seven firms employing between 10 and 25 people and eight that employ more than 50.

5:5.2.4 Company Location

The location of the companies was not of particular interest to this survey, but the question was asked to find out how many of the companies were actually based in Mashhad. Of the information obtained, 16 of the respondents are based in Mashhad, 18 others are based in Teheran but operate in Mashhad and other cities and the location of 7 of the respondents is not known.

5:6 Question Three: Type of Projects

Question three was designed to show the type of projects which the companies were able to carry out. The primary objective was to determine the degree of sophistication of the companies, and to see if it was possible to obtain enough evidence as to the necessity of specialised and large construction companies in the country. For this purpose a detailed list of possible projects under different headings was outlined in order to assist the respondents in completing the questionnaire. This is by no means the complete list of all possible building and civil engineering projects, but the respondents were given some space to write down any other type of project which did not appear on the questionnaire.

5:6.1 Group A: HOUSING

The results indicate that 78% of the respondents were working on housing related projects at any one time. A more detailed exami-

nation indicates that 53.7% of the companies carried out government housing projects, 19.5% private sector speculative housing, 34.1% small private house building activities and 46.3% of the companies were engaged by clients who were building their own properties.

The house building process in Iran as explained in Chapter Four, is comprised of public, private and cooperative sectors; however the majority of housing construction is carried out by the self financed and self built process. In most cases the client (owner) employs small contractors or operators to build the housing unit. Therefore in this process most of the companies are engaged in housing related activities. On the development side, many of the small contractor or construction companies are also engaged in speculative development. A more detailed account of this is given in a later part of this chapter. In discussion with many of the company directors regarding this activity, it became clear that speculative development was the only way these companies could survive during periods of political uncertainty and economic inactivity. On this issue a company director who actually lives in Tabriz (north west of Iran) said that:

> "Every year I purchase two derelict buildings in the inner city. This is the only way I can get access to land because of the recent changes in the urban land ownership laws. Once the construction of the houses is completed I can sell the new apartments at inflated prices to the would-be buyers".

It should be noted that this kind of speculative development is carried out informally and the developer pays no tax on his earnings.

5:6.2 Group B: INFRASTRUCTURE

The results for group B type of projects show that 51.2% of the companies did infrastructural related projects, including 31.7% involved in surfacing streets and related works, 29.3% involved in sewerage construction, 19.5% in water supply, 7.3% in electricity supply and only 2.4% in gas works. One reason for the low level of involvement in the specialist electrical, water and gas works is that much of this kind of work is done by specialist contractors or sub-contractors whom this survey did not include.

5:6.3 Group C: CIVIL PROJECTS

The primary objective of the inclusion of this group was to obtain information as to the extent of the involvement of companies with larger projects such as the construction of ports, airports, major roads, bridges, railways etc. The survey results reveal that 24 companies, 58.5% of the respondents have, carried out civil projects. The detailed results indicate that only 2 companies had been involved with the construction of ports, whilst another 4 companies had undertaken airport projects, because much of the work of this nature used to be carried out by foreign consultants and contractors. However, the results show that a larger number of the respondents are able to undertake road and bridge construction but again only 3 of the companies had constructed railway related projects, due to a lack of such projects in the aftermath of the revolution. Only 2 companies had carried out power and distribution work, 5 cases had recorded dam construction and 8 companies received irrigation projects.

5:6.4 Group D: SERVICES

The survey results indicate that 53.7% of the companies were involved with this type of project. There is a very low percentage of involvement in works such as educational buildings, office buildings, commercial offices, sports facilities, etc. This can be interpreted in a number of ways, one of which would indicate a lack of investment and highlights the economic stagnation which has paralysed the construction sector, as it is this type of project in which most of the smaller construction firms at a regional and local level should be involved. The results also indicate the very low level of private sector involvement in the form of investment in the construction industry, as again it could be expected that many of these projects are usually financed by the public (government) sector.

5:6.5 Group E: RECREATIONAL

The results of the survey indicate a lack of investment, especially in recent years, in environmental and recreational facilities. At the same time it is this type of project of which many of the urban centres are desperately short. Examples of such projects include city parks, recreational facilities community

centres and sport facilities. Many of those existing were provided in the 1970s as the result of the economic boom. The results indicate that only 10 companies, representing 24.4% of the respondents, have ever carried out recreational related projects.

5:6.6 Group F: INDUSTRIAL

One of the surprising results of the survey concerns industrial-rial related projects. It was expected that much of the industrial activity had come to a halt as a result of the economic situation. However, the data indicate that 21 (51.2%) of the respondents have carried out industrial related projects such as warehouse buildings, factories and a limited number of oil related projects (9.8% of the respondents). The largest category of these projects involve warehouse construction, almost 16%. Most of the warehousing construction in Khorasan region is for agricultural activities, thus reflecting a measure of rural development. In Mashhad a relatively high proportion is also related to retail and light industrial sectors.

5:6.7 Group G:MILITARY & SECURITY

It should be assumed that, due to security implications, some companies might not have disclosed their involvement with this type of project. It should be noted that much of the military infrastructure was developed during the reign of the ancien regime. In the 1980s, the majority of the war related projects were constructed by various ministries and were considered of strategic importance due to the sophisticated nature of the projects. Prior to 1979, the majority of the defence installations were designed and implemented by international companies and a few large local firms.

The results of the survey indicate that 8 of the companies had some sort of military related contracts, including 3 cases of air base facilities, 3 cases of army base and 5 cases of accommodation for the security forces. Recent experience has shown that the confidentiality of sensitive military installations designed and constructed by foreign companies, both in Iran and other developing countries, is not respected by foreign contractors. Therefore it is of significant strategic importance that local expertise and capacity in such projects should be developed.

The experience gained as the result of war-related projects carried out by Iranians could prove valuable in post war reconstruction. After the end of the war, the Head of the Defence Related Industries announced that;

> "This organisation has gained valuable experience in many areas. In the post war reconstruction we can offer expertise in areas such as the oil industry, large industrial complexes, the infrastructure and other civilian projects". (I.R.N.A' August 1988)

The effective utilisation of such resources can have positive long term implications in the development of Iran. In the case of China the PLA (People's Liberation Army) played a major role in the economic development of that country by construction of major highways, ports, airports, hospitals, rural development, and even nuclear power stations (Kau 1979).

5:7 Question Four: The Client

The objective of this question was two-fold, first to obtain information to show the degree of government and privately financed projects in the construction process, and secondly to determine the extent to which the works had originated at the national or local level. The results indicate that 68.3% of the respondents were working on contracts which were commissioned by the Government at the national level, whilst 65.9% of the respondents also had projects which were awarded locally by various organisations. Government involvement was also present in the form of para-statal agencies or some quasi- organisations. The private sector financing in construction occurred with 53.7% of the respondents.

The interaction and connections with other variables can be examined by cross tabulation which would require more detailed analysis. The results provide some basis for determining the over-emphasis on the role of the government in financing and initiating works in the form of public works programmes, mass housing and infrastructural works, thus indicating the impact of institutional control over the construction industry as a whole. The government is seen as the major contributor to the development process by the construction firms, both at national and local levels. When asked about this one of the respondents replied;

> "The Government is seen as the ultimate client, because it has control over investment allocation in all sectors of the economy."

On the role of private sector investment another company director was of the opinion that;

> "The level of private sector investment is affected by government actions. The present political uncertainty does not encourage private sector investment, especially fixed capital formation. Speculative investment is the only method for private sector involvement."

Further analysis of the impact of government actions will be provided in the later parts of this chapter.

5:8 Question Five: Others Involved

As the results indicate there was not an overwhelming degree of response to various variables of this question. The results indicate that in 13 cases there was some sort of involvement with the design aspects of the project with the contractor, while there were 12 cases of other parties participating in the construction, this could be assumed that involve some sub-contracting of the work. 53.7% of the respondents had supervision from resident engineers on behalf of the client. In the cases of financial involvement of other parties, only 11 cases were recorded in the form of loans from private or public sources. It is recognised that there would be more information obtained from this section of the survey had the questionnaire been designed to address such issues as the whole process of design and construction.

5:9 Question Six: Problems and Solutions

This section of the questionnaire was of particular importance to the research. In considering the problems and some possible solutions which were listed, the respondents were asked to mark their response with a value between 1 and 5. In section A of question six the main problems were listed as, materials, equipment, workers, credit facilities, and shortage of government investment.

Part B was concerned about the possible solutions which could be considered by the respondents who, as contractors, were more qualified than any other party to suggest ways of improving the serious difficulties that they faced in carrying out their jobs. The respondents were invited to give their opinions on any other issues which had not appeared on the list. The results show that 11 of the respondents added their views on problem related issues and 12 responded to the "other solution" section of the questionnaire. The following section will provide a more detailed analysis of the different variables of question six.

5:9.1 Section A: PROBLEMS

MATERIALS: Problems regarding construction materials ranked as the most serious. Of the 41 respondents, 16 considered it the greatest problem whilst 11 considered it of some importance and in 10 cases it was considered as a problem and, apart from 3 other cases, the remainder of the respondents did not consider it to be of particular significance. Problems regarding the building materials can be of varying nature including a lack of sufficient production or distribution bottlenecks. The degree of seriousness of shortages of materials differs according to the type of projects that these companies carry out. For example, the director of a company whose activities comprise office and residential construction added;

> "About 50% of my useful time is wasted on finding such materials as tiles, ironmongery, paint, glass, and items including taps and hygiene equipment."

Whilst the provision of materials was a serious problem for the above company, another company director who was involved with mainly civil engineering projects said that;

> "The provision of building materials is not a problem for my company. The only material that is needed is cement, and in our case because of the importance of the project the Government usually meets our requirements on time."

It is important to mention that although the nature and importance of the project played a role in obtaining the necessary materials, this was not the norm. This case is illustrated by the

construction of a major dam near Mashhad. As mentioned in Chapter Four, Torogh Dam was the first important project to be constructed in Iran without any foreign assistance. The construction involving the cooperation of at least two ministries, was delayed mainly due to the shortage of cement. In the feature report published in Majaleye Sakhteman (Building Magazine), the Project Manager outlined the two year delay of the project as:

> "Although the project was financed by the Government, the delay in the interim payment and the purchase of materials and necessary items caused some difficulties. With regards to the provision of materials, it was not possible to obtain the required amount of cement on time. This occurred because the cement plants in Khorasan could not meet the daily consumption of 120 tons of cement. The problem was partially resolved only when two ministers and the Provincial Governor visited the site and decided that the allocation of cement to private construction companies should be diverted to this project." (Sakhteman 1989 pp18-27)

The above statement clearly defines the extent of the problems that private construction firms face. Section B provides some evidence of to what extent these problems can be ameliorated.

EQUIPMENT: In order to measure the degree of the seriousness of the problems regarding construction equipment the respondents were requested to express their opinions on this issue. The results indicate that the highest value "5" scored 39%, whilst value "4" measured 26.8%, equal to 11 cases. Ten (20%) companies considered it to be a problem, there were two missing cases and the remaining respondents did not consider it a problem. The degree of problems regarding equipment varied, with the nature of the projects. For example, those contractors who were working on government public works programmes did not meet many difficulties, mainly because they were given access to all the necessary machinery or equipment.

PERSONNEL: The majority of the respondents did not consider the availability of labour whether unskilled, semi-skilled or skilled to be a problem. In other words the problem of labour availability did not cause alarm amongst the contractors. Part of this unexpected result can be attributed to the fact that during a recession there is a large unemployed labour force available in the market, and also there is a large number of refugees from Afghanistan resident in almost all parts of Iran competing with

the local labour force for construction employment. In fact as they are prepared to work for a lower income than their Iranian counterparts, they have managed to fill much of the vacuum in the labour market. The results of the survey are somehow surprising as it was expected to be one of the most serious difficulties that contractors faced, particularly those whose projects included residential and office development which require more skilled personnel. These results should be treated guardedly because of the economic inactivity of the construction market.

CREDIT FACILITIES: It has always been assumed that traditionally there has been a lack of institutional support the provision of financial services for the private sector in general, and for small to medium sized operators in particular. The result of the survey supports this assumption. 58.6% of the respondents considered the lack of credit facilities a serious problem, whilst 7 considered it a very serious problem. There were 4 missing cases and the remaining 6 thought of it as having little consequence. It is particularly surprising that 6 of the respondents do not consider the lack of credit facilities as a problem.

GOVERNMENT INVESTMENT: Perhaps the most sensitive question of the survey, the prime objective was to establish whether this issue was of a major concern for the respondents. It might be termed as too obvious a question, in that every respondent would say that many of the problems cited in the survey were due to the lack of government investment. The survey results reveal that 17 of our respondents (41.5%) considered this to be the highest priority whilst another 26.8% (11) thought that it was of great concern. The results are to some extent to be expected in an economy which is so much influenced by government action, bearing in mind that the government is the sole earner of foreign exchange and thus controls the allocation of funds for all kinds of development programmes. The wider policy implications of this issue will be discussed in the general conclusions and findings of the survey. Eight of the respondents considered it to be a minor problem.

OTHER PROBLEMS: Out of 41 respondents only 11 (26.8%) commented about any problems other than those which were listed in this section of question six. Of the comments which were made, reference was made to a shortage of experienced managers, the use of outdated technology, and the non-use of computers in design, implementation and management by construction and consultant companies. The majority of the respondents attributed much of the problem to the political situation in the country and the contin-

ued war. For example, it was mentioned that much of the decision making regarding planning and allocation of works is done by people who do not have the necessary expertise. There are also many formal and informal barriers which are quite unnecessary, both before the commencement of the contract and during the contract. A lack of coordination in construction demands and utilisation of resources was another problem which was referred to by the respondents. Of the more definitive problems, reference was made to the relationship between the contractor and supervisory team. It was said that at present the two parties think of each other as enemies and do not see themselves as two parties involved in the same job on a site. The seriousness of this problem can be illustrated by the case of the company involved in a particular project whose client was one of the leading banking groups in the country. In his opinion:

> "The projects were delayed by more than a year mainly due to the lack of cooperation of the Resident Supervisor, as he did not approve the interim payment certificates on time. This contributed to the delays in payment and purchase of materials."

In this case the Resident Supervisor was changed twice, but eventually the pressure proved too much and the company gave up the contract six months before completion. These are only a small sample of the respondents' comments, the concluding parts of this chapter will include some of the other views expressed.

5:9.2 Section B: SOLUTIONS

It was considered appropriate to test the opinion of the respondents as "expert knowledge" against the proposed solutions which the researcher had in mind for the resolution of the problems bedevilling the construction industry. The intention was to see if these problems would best be resolved with a better production and distribution system for construction materials, or if the training of a skilled workforce would be better obtained through the traditional method of apprenticeship or on the line of government and official training centres (schools). The following sections provide a more detailed analysis and discussions concerning each of the variables.

DISTRIBUTION: As the survey results indicate, many of the respondents considered a better distribution system could signifi-

cantly reduce the shortage of materials. This is of particular significance as the government has a monopoly over the distribution of all building materials. A detailed account of this issue was provided in Chapter Four and it will be further explained in Chapter Six. From the survey data it can be concluded that the majority of the respondents believed that the materials distribution system was in need of urgent improvement. This is relevant, as distributors have gained much influence as the result of rationed building materials. Some of the respondents argued that;

> ".....those contractors or developers who enjoy good connections with the distributors' network can obtain better quality materials and construction items on time".

PRODUCTION: The improvement of the production system of construction materials was proposed as one option which the respondents could consider. In fact, there appears to be a justification for this. However the necessity for production increase naturally depends on the type of materials. For example in the classification of construction materials, some were termed as "strategic", such as cement, steel, or "specialist" materials including glass, ironmongery, etc the production of which is dominated by the government sector. Prior to 1979 there was a noticeable investment by the private sector in the production of building materials and other construction products often induced by massive government subsidies.

The results presented here are more concerned with building materials as a whole. The survey data reveal that 31.7% of the respondents see the improvement of the production system as highly essential, whilst 26.8% consider it quite necessary and 22% think of it as an improvement which should be carried out. One of the respondents commented;

> "There should be some government incentive to encourage small companies to participate in the production of construction materials. It is also necessary that there should be an improvement in the quality of Iranian products."

The restrictions imposed on the import of foreign materials has pushed the price of such products very high, in some cases artificially. Many of the contractors prefer to obtain foreign products rather than the Iranian ones, not because they are of better quality, but because they can sell them and make some profit.

TRAINING: The objective was to find out which method of training skilled construction workers was preferred by the respondents through institutional training facilities or more traditional methods. A relatively high proportion of the respondents recognise the role of institutional training, and a small percentage (3%), see it as a vital remedy. However, the overall impression is that this method of training is preferred to the other, considering that 21 (50%) of the respondents did not provide any answer for the latter. Therefore the results need to be treated with care.

INVESTMENT: In a period of economic inactivity it is probably justified to expect that every body will place the responsibility for this on the government's shoulder; therefore the results of the survey might reflect some of this expectation. As far as the data show, it is apparent that a relatively high proportion of the respondents regard the role of government in the form of investment in the construction sector as vital; this measures around 48.8%, numbering 20 out of 41 firms. A further 19.5% thought that more investment would help to reduce the problems which are affecting the construction sector. The opinion of the rest of the respondents varied from a measure of indifference to a degree of concern for more investment in the construction market. There were 4 missing values.

LOANS: As was explained in Section A on financial service, for the private sector construction companies traditionally the situation concerning obtaining loans has not been adequate. This situation has deteriorated to some extent in recent years due to the change in the banking system and the financial institutions' being nationalised. This particular variable was included in the questionnaire to test the respondents' reaction to strengthening loans facilities. Of the 41 respondents, 12 (29.3%) did not respond to this question whilst another 29.3% thought that the provision of financial assistance in the form of loans would be highly desirable.

COMPANY LAW: The laws concerning the legal and financial status of construction companies underwent a dramatic reorganisation according to the new constitution drawn up after 1979. The primary goal of the change in the law was to place stricter control over the activities of the private sector. It encouraged joint shareholding rather than public limited companies. As discussed in the early parts of this chapter, the share-holders were required to have relevant academic qualifications and professional

experience of the proposed business. The idea is that the private sector could operate under government supervision (not direct day to day control). But the result of the survey shows a somewhat mixed response. The majority of the respondents thought that there was a need for some sort of change in legislation concerning the companies and the labour laws. Many companies and private business concerns regard government policy toward the private sector as suspicious.

LABOUR LAW: The attitude of the companies towards the labour law is of a mixed nature. Whilst a relatively large number of observers believe that the recent change in the labour laws has improved the legal status of the workers, at the same time the companies do not view this very favourably. As can be seen, 46.3 per cent of them did not express any opinion. The views of the rest of the respondents varied from relative to definite needs for change. Of those respondents who expressed their views by writing comments, some thought that increasing the level of education would solve the problem of labour relations. This is particularly relevant as many employers believe that many of their workforce do not know their rights accurately and in consequence expect too much from the employer.

OTHER SOLUTIONS: Again the number of respondents who expressed their views in this section was relatively low, only 29.3%. Many of the views concern the lack of participation of the private sector in the production of essential materials and construction equipment and machinery. It is suggested by some that the private sector should be allowed to participate in the import of building materials and be provided with foreign exchange. Others also suggest that the process of awarding contracts and pricing should be changed. The formation of co-operatives for the development of the construction industry is envisaged by some of the operators and it is recommended that such cooperatives be set up by professionals and experts with a clear mandate and direction. The following section reflects views expressed by the respondents suggestions possible improvements of the construction industry.

5:10 Major Implications

There are a number of serious implications which have come to light as the result of this survey. It has already been argued that although the size of the sample is relatively small, at the

same time it gives a reasonable measure of evidence to draw some conclusions. The connection between the different questions of the questionnaire and the inter-relationship of the different variables can be examined in order to make further observations. The aims of the survey were to find possible interdependence and interactions between planning and the construction industry, also to illustrate the nature and extent of government involvement in the construction process at national, regional and local levels.

The questionnaire did not raise any questions regarding planning, but it is quite possible to determine the relevant evidence to support the idea that both the economic development planning and land use planning system have a direct impact upon the construction industry.

Before determining the implications of the findings of question one, it is vital to point out that in the Iranian construction industry the private sector plays a significant role, but a role that is not so much evident or accepted by the private sector itself. This is the development and property speculation by the smaller "construction companies" or contractors, and by the informal sector of the construction sector. The Persian word for the informal involvement of the construction companies and operators in property development and speculation is "Besaz va Befroosh", meaning literally "build and sell". The appropriate equivalent English phrase for this kind of business venture is Real Estate Development. In Persian, however, the term is not so respectable, thus it was rather difficult to use the name referred to above. The reason for this difficulty is that it is widely recognised that "cowboy" operators do this kind of business and therefore it is not considered respectable. For this reason in the Persian version of the questionnaire it was necessary to avoid the use of this term and the alternative phrasing was "building dwellings with the use of your own capital".

The extent the respondents admitted to this kind of business venture was surprising. The implication of this in terms of economic contribution and the operation of the construction industry is highly significant, as to some extent this part of private sector involvement is not absorbed by the economy and the government loses much of its income from taxation. It is this contribution by the informal sector which has a dramatic effect on the efficient running of the construction sector. This is particularly so in the situation of a "war economy" when the government introduces a rationing system for price control, thus

taking control over distribution. Whilst the informal operators use many of the materials for their business ventures, they also increase the potential for black marketeering and shortages of essential resources.

The implications of the replies to question two regarding the size of the company and the location of the company is important so far as they highlight the fact that the number of smaller companies form the majority of the construction companies, at least as far as the respondents are concerned. However, it is safe to say that the same would have been true had all the country's construction companies been surveyed. Another implication is that a surprising number of the companies which operate in different regions are actually based in Tehran. This further implies that there is a need to support the construction companies at the regional level and to strengthen them in order to prevent the flight of capital from these regions.

Some implications of the response to question 3 have already been discussed (i.e. type of work). However, if the relationship is considered between question three, "type of projects", and question four, "type of clients", one can make an interesting observation. According to the nature of the contract and whether the project was awarded at national, regional or local level, there is a degree of overemphasis on top down planning. The evidence suggests that in the majority of cases the decisions are made at the national level even for those projects which are implemented at the regional or local level. This contradicts the government's promise of a shift to increased regional decision making and regional autonomy. Emphasising this point, one of the respondents remarks:

> "the present centralised nature of decision making has created a rigid planning system which does not allow any measure of flexibility. The present situation of the country requires both short term and long term planning which clearly sets out policies and direction with emphasis on regional planning in order to ensure a more just and equitable distribution of resources for the development of the country."

The findings of question three, as far as the role of the companies is involved, have strategic implications. As has already been discussed (Chapter Two, Chapter Four and earlier parts of this chapter) the experience of many countries dependent on foreign companies for the construction of many of their sensi-

tive civilian and military projects has shown that technological dependence often leads to economic and political dependence. This is particularly true in cases when the relationship between the countries is restrained; in case of hostilities, there is a breach of security because confidentiality cannot be guaranteed. In the case of Iran in the late 1960s and the 1970s, many of this type of project were carried out by American and European companies. The change of the political system in Iran resulted in a period of tension between Iran and the Western countries, so most of the companies pulled out from their operation in Iran. This has resulted in many expensive and vital projects being abandoned before completion.

At the same time, due to the political upheaval in the country and as the result of the partial shift of emphasis from the private sector in favour of a mixed economy, many of the larger construction companies were dissolved or were taken over by the government due to bankruptcy. This has created a political dilemma. On the one hand the government has committed itself to the promise of economic, technological and political self sufficiency, but on the other hand it cannot fulfil this goal because there are not many specialist private contractors left in the country to undertake the planning and implementation of large projects. In the absence of private contractors, as mentioned in Chapter Four, this task is left to the government sector. In the aftermath of the end of the war, the government awarded a number of projects including gas pipelines and other infrastructural works, to expatriate companies. This has caused an outcry from the domestic private contractors. In a seminar organised by the Mayor of Tehran to find solutions for underground car parks in the capital, a number of speakers expressed the view that Iranian contractors were able to carry out such projects. Reflecting the anxiety of a number of Iranian experts one of the speakers said:

> "Today our specialists and engineers are capable of planning and implementing major projects including pipe- lines, refineries, ports and roads, but it is unfortunate that the government, instead of supporting the domestic private companies, asks for foreign assistance".
> (Sakhteman 1988, p15)

Other speakers whilst supporting the above argument, suggest that the government should assist the private sector in order to set up larger specialist consultant and contractor groups for the planning and implication of sophisticated projects. They add:

> "....and in cases where there is genuine shortage of expertise, then with the direct employment of individual expatriate personnel, it could prepare the basis of transfer of technology and knowhow to Iranians". (Sakhteman 1988, p16)

In order to back up their arguments they pointed out to the experience of other countries including India, China and even Japan.

With regards to question four, previous discussions have already focused on the role of government in the overall economy and the resulting effect on the construction industry. The experience of other oil based economies (ie. the high income , middle income and lower income OPEC members in the Middle East, Africa, Asia and South America) has shown that the governments of these countries act as the sole earners of foreign exchange and thus have control over the distribution of this income. This gives rise to a process of over-centralisation. Furthermore, the results show that the involvement of the private sector in investment in the industry is relatively low. The implication of this is twofold; one aspect is that at present the private sector looks to the government for project initiation and investment rather than injecting capital in the construction industry itself.

Question five, "others involved", does not provide the survey with much evidence to draw any substantial conclusion to the merits of involvement of other parties in project implementation. Had the question been designed to contain more specific information regarding the planning process, and had it been centred around the notion of subcontracting of work for specialist jobs, it would have been possible to obtain more accurate data to support the ideas put forward in the thesis.

The implications of the findings of sections A and B regarding problems and proposed solutions can be on different fronts. The issues which have been recognised as major problems as far as the contracting side of the construction industry is involved, centre around the availability of construction materials, equipment and resources. Others included a lack of government investment, credit facilities and personnel. Although the data are not sufficient for reaching an overall conclusion regarding the national situation, to some extent they give an indication of the extent of the problems.

One of the major implications of the findings concerns the production and distribution of construction resources. It is quite evident that many of the shortages of construction resources can be attributed to the distribution system. The logic behind government intervention in the distribution of materials and other essential construction items was to prevent black marketeering and to ensure just distribution for all income groups. The resulting situation has been the creation of a bureaucratic nightmare, thus giving rise to hyper inflation with high prices which have automatically cut off many of the different income groups from obtaining building materials at the affordable official cost. This effect has had other impacts on the quality and safety of much of the building work due to insufficient use of cement or structural steel.

The implications of shortages of skilled personnel do not seem to be serious, as far as can be seen from the data. It has already been shown that most contractors have difficulty with personnel, shown by their long lists of complaints as to the shortage of properly trained craftsmen or skilled personnel. On the other hand, at a more senior level there is an even more acute shortage of managers and specialist consultants and experts. At times of economic depression and inactivity in the construction industry, there is an adequate supply of personnel with different skills. However, once the task of reconstruction starts, then there will be an acute shortage of technicians and other personnel.

The educational establishment has a major role to play to ensure a constant supply of highly educated personnel or technical staff. Amongst the comments which were made by a number of respondents regarding the different methods of staff training, those who preferred the traditional methods of training stated that:

> "one danger with the system of formal training that is done in technical colleges is the fact that graduates of such establishments prefer to sit behind desks rather than get involved with site work; in other words they do not like to get their hands dirty".

Another company director, whose company was mainly involved with office and residential buildings, complained of the lack of skilled workers and technicians and attributed much of the inferior quality of work and wastage of materials to this factor. He went on to say:

> "the situation of the construction industry and the difficulties that it faces can be attributed to, firstly, a lack of updated managerial skills, and secondly, a lack of technicians and skilled labour".

The implications of the government's role in the distribution of funds to different sections of the economy and its responsibility for investment in development projects is, however, very significant. The respondents attached great importance to this factor which has political implications. For some time in the aftermath of the revolution the government used its leverage over the economy to bring the activities of the private sector under its control and subject to close scrutiny. This resulted in the exodus of much capital and expertise both during and after the revolution. During the eight years of continued war, the economy was subject to special controls related to the war economy: hence the introduction of a severe rationing system and disinvestment in the construction industry in particular. That part of the industry which enjoyed a degree of investment was restricted to military and defensive projects which were carried out mainly by the public sector of the construction industry.

The private sector's share of the market has been reduced and it is at present totally dependent on government investment in the construction sector. The private sector currently does not trust the government to contribute to the construction industry by investment. The government recognises the fact that the private sector plays a major role in economic activities and its traditional contribution to the construction sector, but so far it has failed to create a situation which will attract private investors. One of the major tasks of the government is to encourage private sector investment in the housing market, especially through low cost and low income housing, in order to revitalise the construction industry. The mechanism by which this policy has been pursued with the tool of land use planning will be discussed in Chapter Six.

5:11 Conclusion

The different sections of this chapter covered the questionnaire survey of a limited number of construction companies in a regional context. This survey was not designed to act as the fundamental basis for the support of the hypotheses of the thesis. However it was designed to give further details of the particulars of the construction industry and specifically the contracting side of the industry in the Iranian context because of the familiarity of the author with that country, both on a professional and geographical basis. The results of the survey, however, have given some insight into the construction industry in Iran based on the response of professionals involved extensively in the sector. The evidence which has been collated provides a measure of support to the ideas which have been put forward in the thesis regarding the situation of the construction industry in Iran.

The analysis of survey data and the implications in terms of government policy, both in the past and the future, should be regarded as an indication of the issues concerned with the construction industry. On the basis of this survey it could be said:

a. There is an over-dependence of the economy on oil income,

b. Government monopoly over oil income and investment allocation has resulted in over-centralisation,

c. Although the lack of major projects in the regional context can be due to a lack of investment funds, at the same time it would indicate to a centralised planning system,

d. The weak regional emphasis is further demonstrated by the presence of larger contractors from outside the regions who carry out important works at the regional levels in the absence of local contractors,

e. The survey findings indicate that the private sector is in need of government support; in the post war context this is a prerequisite to reconstruction,

f. The improvement of shortages concerning the unavailability of materials and lack of personnel can only be achieved through effective planning and coordination.

The most serious policy implications as, have been discussed, relate to government involvement in an economy dependent on oil income in a country which has had a turbulent recent history, specifically regarding economic policy and external relations. Although the situation of the construction industry may be regarded as unique mainly due to the existence of a war economy and a period of economic stagnation during political instability and social upheaval, at the same time most of the difficulties which exist can be found in many other countries. Depending on the stage of development and the nature of the planning system, both in terms of economic development and land use planning, the operation of the construction industry is very much affected by the government of these countries. As will be shown in the case of the China and Japan the governments of these two countries played a major role in the support and promotion of the construction industry despite the fact that they pursued different political ideologies. The findings of the survey have at least provided us with a degree of evidence of the extent of the difficulties that need to be addressed by the policy makers in Iran.

It has been argued that if only the planners in countries such as Iran chose more appropriate technological constraints for their construction industries, some of the problems identified in this chapter's survey analysis might be lessened. Chapter Six therefore explores the question of appropriate technology in the context of Iran.

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CHAPTER 6

6.1 Introduction

Previous chapters have provided a detailed examination of the process of planning and construction in the Iranian construction industry. Chapter Five gave a detailed analysis of a survey of selected construction companies and their roles in the development process and the ways by which they were affected by the planning system. Different problems were identified amongst them shortages of essential construction materials and resources. In order to validate the second hypothesis, ie:

> The choice of construction technology and resources is determined by economic and physical planning policies.

This chapter examines the following:

> The justification for the selection of appropriate technology;
>
> Socio-economic considerations in the choice of construction technology and resources;
>
> Factors influencing the process of technology transfer, i.e international, national, and urban-rural settings;
>
> Market conditions and the resulting effects on the choice of construction technology and finally;
>
> The role of land use planning policies in inducing of land and property speculation.

In this context the account of research into the nature of technology transfer from urban to rural areas and how small companies contribute to this process will be provided. The observations of the field research brought about a number of questions on the applicability of the A.T concept, its necessity and the reasons for its failure which will be fully analysed.

6.2 Resource Implications of Development Strategies

In the development process probably one of the most daunting tasks for the planners or other professionals is to make decisions on the type of technology to adopt for the realisation of various development projects. It could subsequently be argued that the choice of technology inevitably depends on the resources available and the circumstances in which this question is addressed. The setting could be in developing regions or the developed world. By taking into consideration the socio-economic and, more importantly cultural aspects, the task becomes even more difficult. With the increasing industrialisation of the construction industry and the building materials sector in particular, Spence et al (1983) state:

> "the materials problem is particularly acute everywhere: organised building activity has increasingly come to depend on supplies of factory-made building materials, such as cement, steel, and glass; building projects tend to make progress only while these materials are readily available. But, almost everywhere, the demand for these materials greatly exceeds the supply causing delays, wastage, rising prices and black-marketeering. Projects are held up, often for years, or even abandoned, because they cannot be completed as specified".

It is naturally desirable to promote the development of a more resource conscious and a more appropriate technology construction for Iran or other emerging industrial countries. On the surface it seems logical to assume that the choice will be based on the use of suitable technology which employs more available resources; however, as will be illustrated later in this chapter, this choice is influenced by many factors.

It was pointed out in Chapter Three that most of the development programmes, both before and after the 1979 revolution, were devised based on the goal of industrialisation. The examination of the performance of such programmes reveal that without any doubt this aim has not been realized. Kamran Mofid, in his extensive study of the Iranian development planning and process, notes that the failure of industrialisation in Iran is due to many factors including economic as well as socio-political, cultural, historical, internal and external factors (Mofid 1987, p172). This argument is concerning the broad aspects of industrialisation and technological

choice in Iran, but at the same time it is relevant to the immediate concern, mainly the construction technology and its impact on the development process.

The constraints to development and industrialisation in Iran can be mainly attributed to the shortage of skilled and semi-skilled labour and the lack of socio-economic infrastructure. Much of the technology adapted for development was imported technology which lacked any correspondence with Iran's existing indigenous endowments. The same situation applies to other developing countries, and on this issue Robert Solo (1966) argues that the technologies developed in the advanced countries which are subsequently transferred to these societies are developed and adopted in a society with a different social and physical environment to that of a developing country. Thus:

> "...the technology has been developed, in countries for the benefit of their own endowments, and not for the benefit of those developing countries which are importing such technology". (Solo, 1966 cited in Mofid, 1987)

In this chapter discussion will be developed around such issues of technology transfer, especially constuction, at international and national levels and it will be shown how this process actually happens in an urban/ rural context. Kamran Mofid, when discussing the notion of imported technology and the failure of industrialisation in Iran, argues that;

> "clearly there exist major differences in the physical cultural, religious, historical and socio-political aspects of Iran and the Iranians, from those of the places from where technology was imported, so that the problem of "inappropriate technology" may well have arisen in the case of Iran". (Mofid 1987, p173)

As it was pointed out in Chapter Three, the strategy for development in Iran was based on industrialisation through import substitution, and the idea that you could buy the best technology from the best available source and import that technology in order to create an industrial basis (Chawla 1979, p164). This idea was in evidence in the 1970s, especially after the oil price rises when the fifth Five Year Development Plan was revised and many sectoral allocations were increased, including that of the construction industry. It was during this revision that the "crash housing programme" was

introduced, with the strategy based on eradicating the housing shortage through industrialised building. Although an extensive programme was devised and the United Nations' ex-perts were invited to draw up proposals for this task, the programme failed mainly because of the lack of locally available resources for imported advanced technology. This clearly illustrates that technology transfer and development strategies have an inseparable interaction.

In the following section an examination of the factors that influence the choice of technology in the implementation of development projects is presented.

6:3 Factors Influencing the Choice of Technology

The previous section highlighted the fact that planners in Iran, both before and after the 1979 revolution, based the strategy of development on the industrialisation of the country whilst neglecting agriculture and other sectors of the economy which would have offered better long term development options. This argument presents a notion that development plans are devised by decision makers who are influenced in their decision making process by many factors. Amongst these are political and economic factors, social and cultural aspirations and market conditions. Each of these factors will be discussed in the following sections.

6:3.1 Political and Economic Factors

The construction industry has traditionally been used by most politicians in many countries as a political tool, according to their needs. For example, during periods of acute unemployment and social disruption, in order to alleviate the situation they can inject more investment into the construction industry in order to create job opportunities. In many of the developing countries, because the governments have a monopoly over the investment decisions, they can be influenced by the owners of large construction companies and importers of construction materials and machinery (Halliday, 1979).

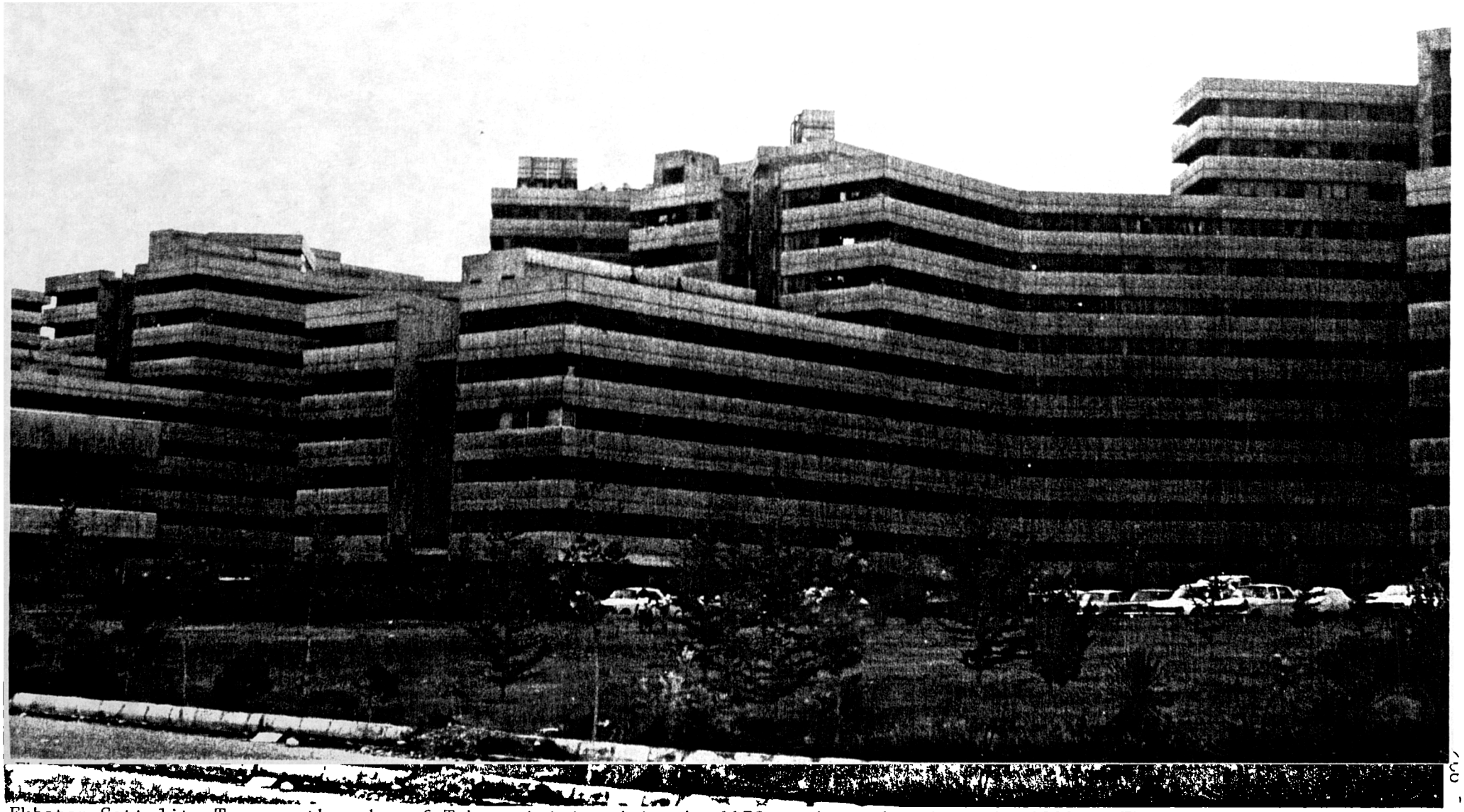
Large projects and other development works are often commissioned by the government ministries or departments to national

or international consultants or contractors for planning and implementation. Figure 6.1 shows Ekbatan sattelite town on the outskirts of Tehran, planned in the 1970s. The whole development was based on imported construction materials and production methods. During a marketing tour of the phase two of the development, it was noted that even the fitted kitchens were Italian as part of the original plan. The construction of this housing development was delayed because the original foreign contractors had pulled out and the production plants had been standing idle for almost ten years due to a shortage of raw materials and spare parts. It is safe to assume that such plans were devised in order to employ imported technology and therefore materials. This in turn pushes the cost of construction up, as local resources are not utilised, thus serving the interests of influencial people in charge of the importation of construction materials and other items (Pesaran, 1982, p502). International consultants by nature prepare plans which show a high amount of expenditure and thus have a high percentage content for their fee. It is not profitable for such organisations to engage on low budget projects (Ohara, 1988). As discussed in Chapter Four, alternative designs based on locally available resources and indigenous planning principles can produce more humane and environmentally desirable settlements. Figure 6.2 shows the use of such a policy in action in Shushtar New Town.

On the other hand, the experience of development in many developing countries in the past thirty years has shown that much of the investment in a public works programme is in capital intensive industries (Katouzian, 1983, p260) or prestige developments such as large scale government office buildings, high cost high rise housing complexes etc (Mofid, 1987). According to Healey et al (1985), this process is bound to create profitable opportunities for the construction industry. On the notion of the relationship between the construction industry and the state, Healey et al go on to argue that;

> "The method of channelling resources into the construction of urban space will have important distributional consequences. The allocation of public works' contracts to private firms offers major opportunities for patronage by state. Allies of the state may be rewarded with contracts and enemies punished by the withholding of profitable sources of work. Indeed, the volume of public works' contracts is sufficient to encourage new groups to

Fig. 6.1



Ekbatan Sattelite Town on the edge of Tehran initiated in the 1970s and completed in the 1980s. The original plans were prepared by Italian consultants and the construction method was entirely based on prefabrication technology.

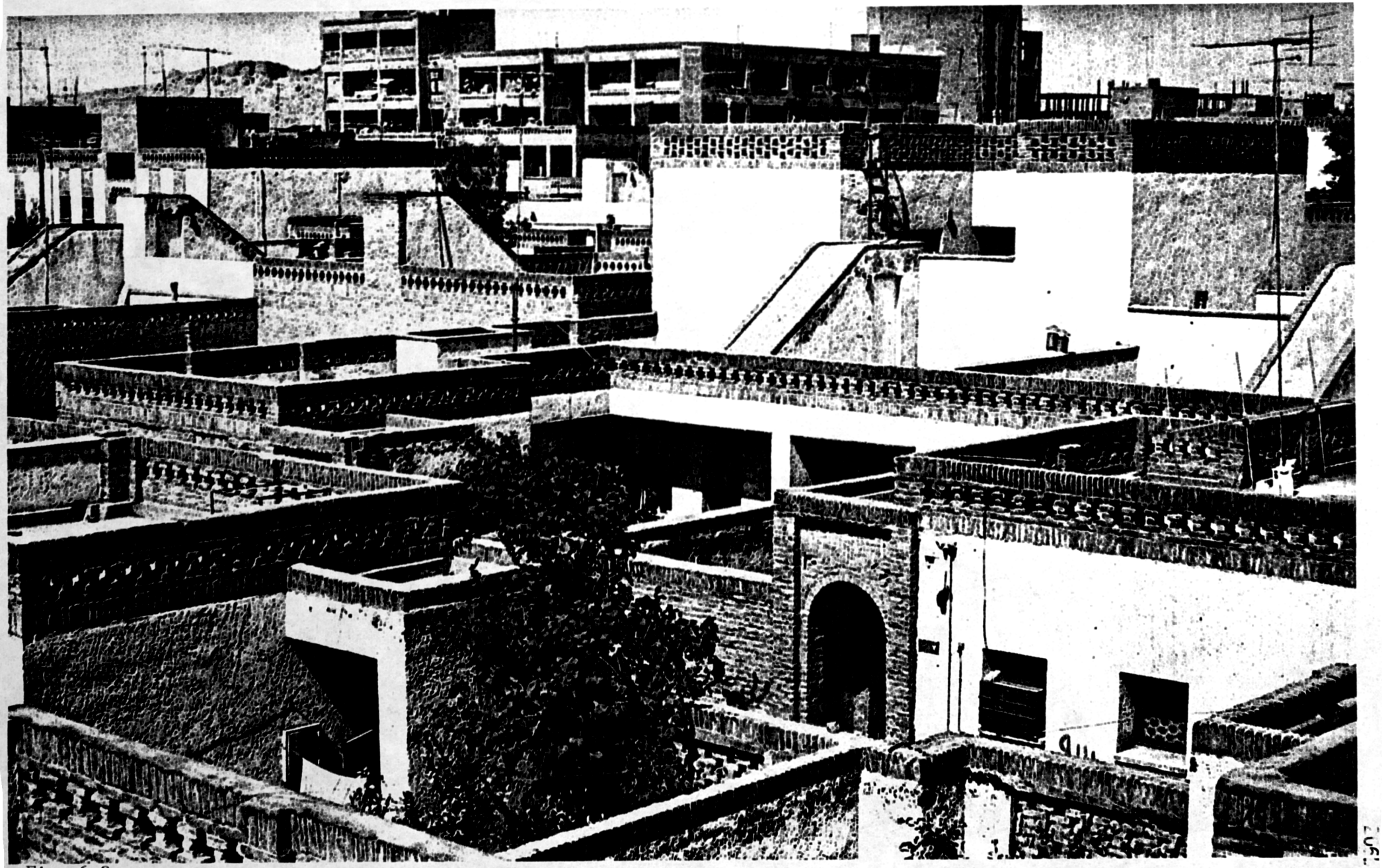


Fig. 6.2
The development of Shushtar New Town was a departure from much of the 1970s developments which were based on alien planning principles and methods of construction.

> enter the construction sector. By favouring some companies above others the state may encourage the development of new interest groups and impede the growth of others. In addition, major investments in construction and related processes of urban growth create new opportunities for wealth creation. Related activities such as land speculation, the manufacture of building materials, and the provision of transport will provids major sources of profit." (Healey & Gilbert, 1985, pp10-11)

The direct control of the government or public agencies of the construction industry undoubtedly has a major impact on the type of technology and materials used. Various World Bank and U.N reports and publications highlight this problem. The 1983 World Bank Report concerning the construction industry in developing countries finds:

> "In labour-abundant and capital-scarce economies, increased emphasis should be given to the use of appropriate construction technology. Projects that are small in scale and use low-technology construction, these include; for instance, rural roads, irrigation and flood control works, and schools; should be able to use labour at wages that will make labour-intensive construction cost-effective; and whenever possible, local materials, and local practices. Design should be adapted to suit the construction technology appropriate to the region. Efforts should also be made to remove distortions in prices that affect the use of these technologies, or to mitigate the effort of those distortions, for instance, by encouraging contributions of at least part of the inputs (such as labor and materials) by local communities."

In the subsequent sections examples will be given in order to illustrate the impact of decision makers and planners on the choice of technology for the construction of large public works' programmes. It is important to mention that such practices are not confined to developing countries alone, as can be seen in the following example.

Examples of inappropriate technology applied in the developed countries can be found in some of the post-war housing developments in Britain. Although much of the failure has been blamed on inappropriate or bad design, part of it was because of unsuitable methods of construction. Figures 6.3 and 6.4

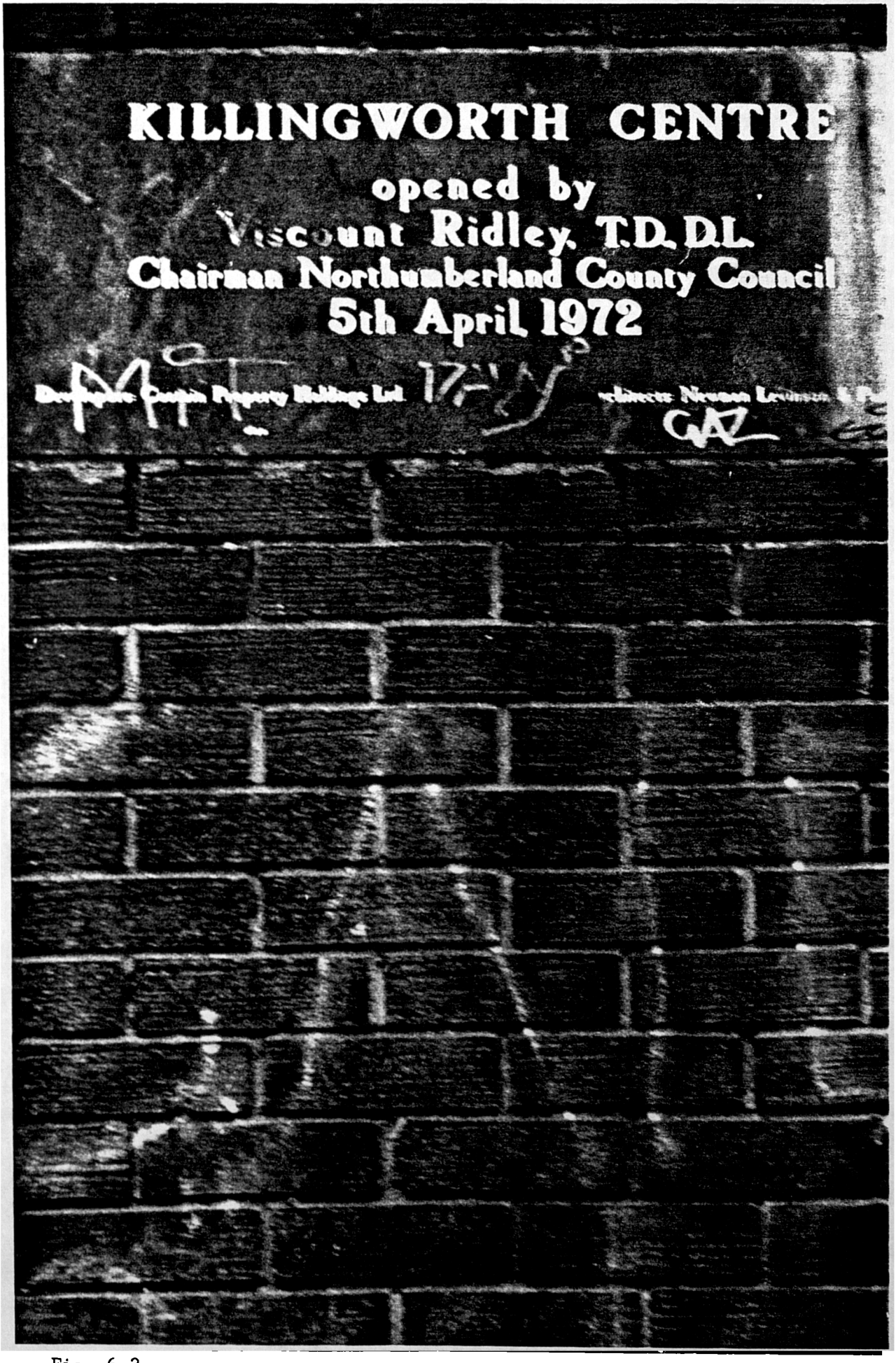
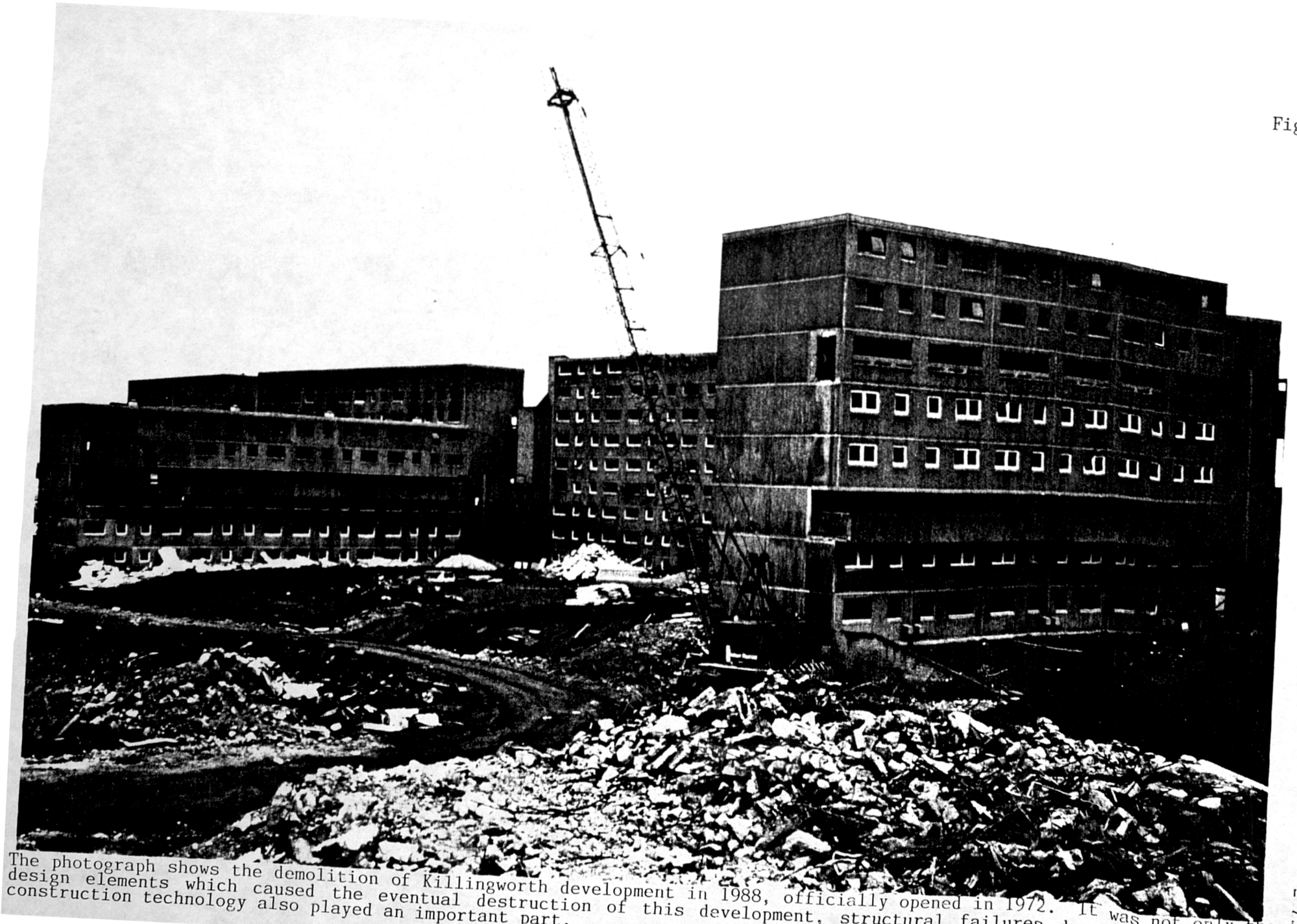


Fig. 6.3
The failure of much of the prefabricated high rise residential development was not confined to developing countries. The photograph shows the date of the official opening of Killingworth in Tyne and Wear.

Fig. 6.4



The photograph shows the demolition of Killingworth development in 1988, officially opened in 1972. It was not only the design elements which caused the eventual destruction of this development, structural failures due to inappropriate construction technology also played an important part.

clearly illustrate this example as experienced in Killingworth near Newcastle upon Tyne. It shows how short-lived such developments can be. There have been periods when new technologies have been applied on a large scale, but this has often been with insufficient field testing and disastrous and costly results. In the case of Britain, many local authorities are now counting the enormous cost, estimated at between #10-20 billion, of repairing and renewing the high-rise blocks of flats built with the concrete slab/wall frame system introduced in the early 1960s. In Ambrose's (1986) words;

> "the 1965 subsidy arrangements gave local authority housing departments every incentive to build high. They were urged by government circulars not to do any evaluations of the new industrial building system themselves, but to rely on the technolgical advice produced by the National Building Agency- the latter, of course, relying to some extent on the expertise of people with a commercial interest in promoting the new systems. Another problem was the damp penetration caused in the timber framing for the inner skin of the cavity wall developed by Barratt's. Damp penetration and rot may lead to heavy repair costs for thousands of home owners in five to ten years time. This shows that two of the main innovatory technologies introduced into residential construction have backfired badly." (pp163-165)

It is not surprising, therefore, that similar mishaps occur in the Third World. The same pattern of development was much in evidence in the 1970s in Iran, during which numerous housing projects were developed using prefabricated technology produced by imported production plants which were dependent on foreign expertise and spare parts. Examples of such cases can be seen in figures 6.5 and 6.6, when housing developments were halted for a long time. Whilst the extent of the problem was recognised at a fairly early stage in Britain, all development of this nature was halted and the the heavy costs were absorbed by the relatively strong economy, the economies of the developing nations cannot assimilate such heavy costs. The most striking impact of such political effects on the choice of technology adopted for the development of massive house building activities, in the form of land use planning policies of the 1970s in Iran can be found in the "crash housing programme" initiated by the government (Plahn 1976). The discussions here will focus on the nature of this programme and the

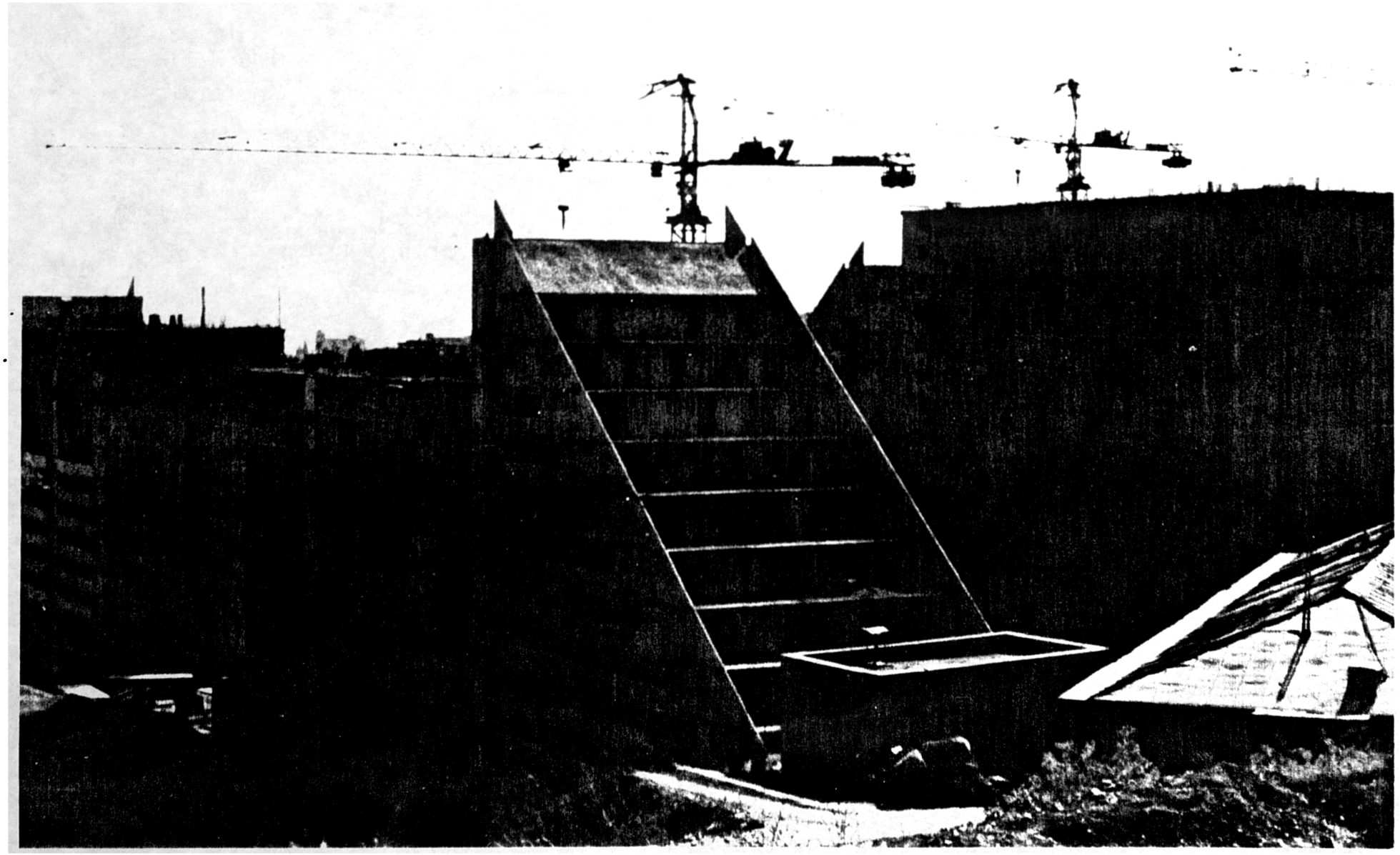


Fig. 6.5
Example of mass housing development based on imported prefabrication methods of production. This is one of the many government back residential development of the 1970s in Tehran.

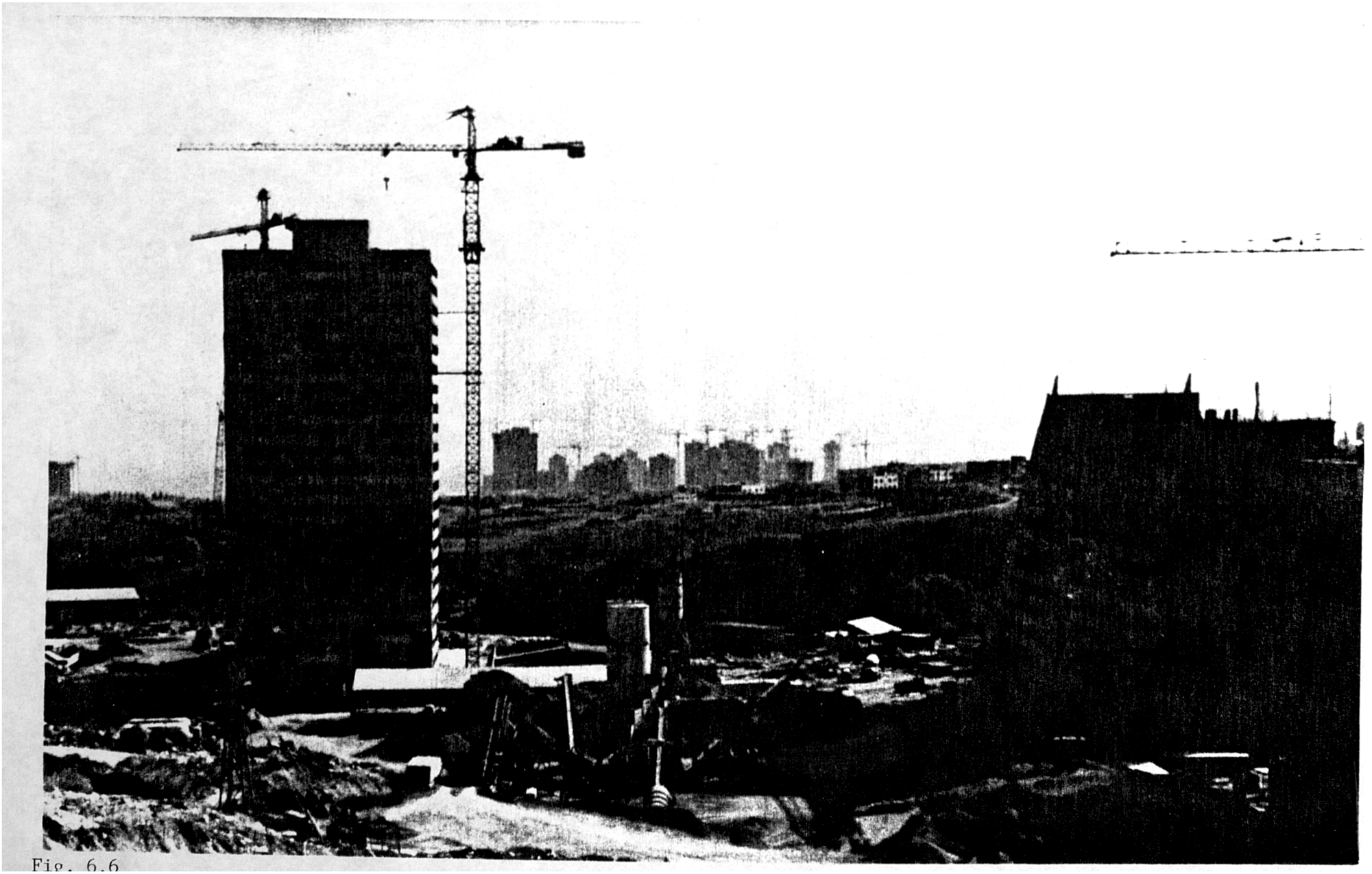


Fig. 6.6

Fig. 6.6
Use of modern construction technology for residential development in the 1970s changed Tehran's skyline to one resembling a large construction site.

way by which political ambitions affected a strategy based on large scale industrialisation of the construction industry more specifically the housing sector. Detailed study of the crash housing programme can be found in McCutcheon's work (1979). The examination of the crash housing programme will be on two fronts, first from political then from planning points of view.

6:3.1.1 Political Factors

In the mid 1970s, in order to alleviate the acute housing shortage and in order to improve the physical quality of the urban areas, especially Tehran, the Government initiated a number of policies as part of the Fifth Five Year Development Plan. The idea of the crash housing programme was conceived during 1975 and 1976 in the form of an extensive programme to create 200,000 housing units in three years using the prefabrication method of production (Pajevic, 1975). The idea was to import 150,000 lightweight prefabricated units and to produce 50,000 units locally by housing factories which were themselves imported. The logics behind such a strategy were outlined by the then Minister of Housing and Urban Development, Homayoun Ansari, during his key note speech to the Iran-Danish Symposium in 1976, named "Aims and Means of Industrialized Building" (McCutcheon 1979, pp381-2). In his address to the Symposium the Minister stated that;

> "....the rapid economic growth of Iran during the past decade has led to particular problems, one of these is the shortage of housing. The expansion of activities in construction and housing has been so great that domestic production of building materials and even the importing of materials has not been sufficient to meet the high demand of the sector. The highest priority in meeting these demands was mass production, lowering the price of building materials and building industrialisation...."

The agency responsible for the implementation and construction of 100,000 units was the Mortgage Bank of Iran which commissioned the Building and Housing Research Centre as its consultant and advisor. As we examine the nature of the programme it seems that an international conspiracy is being unravelled of which McCutcheon speaks of as an international club which existed in the 1960s and 1970s of European and

American experts who promoted the use of prefabricated and industrialised methods of construction. They found an easy target in Iran which was benefitting from a surplus of capital ready for investment. The BHRC in turn commissioned a UN team of experts which had already carried out an evaluation method for building systems. The team had been previously asked by the Ministry of Housing to prepare a report on evaluation methods for building systems, and their work had concentrated on modern and advanced methods of construction. They had categorised into four the building systems which included; a) industrialised, b) special c) rationalized and d) traditional building systems. Whilst this report listed in detail information on 132 industrialised, eleven special, nineteen rationalized and eleven other building systems, after a year's work they had not collated any information on the traditional building system in Iran (Konye 1976). This clearly reveals a deliberate attempt at neglecting the traditional modes of construction and an active role in the promotion of the prefabricated and industrialised building system. The discussion on the technological aspects of the crash housing programme will be pursued in later parts of this chapter, but our attention will be turned on the planning aspects of the crash housing programme.

6:3.1.2 Planning Aspects

Another aspect of the programme was naturally the promotion of the idea of apartment habitat for the low income groups. On this subject McCutcheon adds that;

> "....prefabrication or industrialised building was not the only housing policy based on the principles of modern technology which was in circulation among policy makers in Iran. During the 1970s apartments and large scale housing projects received increasing attention as complementary parts of a solution to the shortage of housing for low income groups" (Mc Cutcheon 1979, p397).

This should be viewed in conjuction with the fact that the traditional Iranian housing comprises a one or two storey building erected around a courtyard, or modern flats based on the same principles, constructed either by a reinforced concrete or steel structure and fired brick. In order to promote

apartment building the government took a series of measures, including the lowering of interest rates of loans for apartment building specifically (PBO 1976). Also, in order to ease the congestion of the south of Tehran which has been the depressed part of the city, an attempt was made to encourage private developers to engage in apartment building for the low income groups and a measure of land use planning was introduced. In 1976 the Construction Bank and the Tehran City Council unveiled plans for granting loans to owners of old buildings who were prepared to convert such buildings into apartment blocks, especially where the land was not less than 2000 square metres. It can be assumed that all such conversions and new constructions were based on modern construction techniques, partly as the result of government policy and partly due to the market situation. As mentioned in Chapter Four, during the 1970s there was a buoyant construction market. During this time much of the residential construction was carried out by the private sector. The private sector by its nature promotes the use of modern technology and materials. It was also during this time that the concept of new towns and satellite towns was introduced to Iran (PBO 1976). The government encouraged private developers to embark on the construction of satellite towns near the big cities with low interest rates. This is also partially due to the fact that as the result of the high land cost in the big cities most developers turned their attention to the periphery of the cities in search of cheaper land and easier planning regulations (Ghanbari Parsa et al 1987). The next section of this chapter will concentrate on social aspirations and their affect on the construction technology.

6.3.2 Changing Aspiration and the Market Affect on Building Technology

The previous section provided a detailed account of the impact of political and economic factors influencing the choice of technology for development programmes. There are other factors that influence the choice of technology, amongst these changing social aspirations and market conditions are most prominent. The following discussions will focus on the above factors in order to show how they do actually affect the construction industry and the consequences of such impact. However, in order to get a clearer picture of the process of

technology transfer, it is of particular interest to turn our attention to the prevailing trends in the construction industry at large, but especially in the housing construction process in Iran.

6:3.2.1 Recent Trends in Building Technology

Amongst the most prominent building techniques employed in the construction process in Iran the following prevail;

I) Adobe; mud and mud bricks as the main materials. Load bearing walls with domed roofs. Mainly used in remote areas but, as structure is not resistant in case of earthquake and other natural hazards, and now because of social prestige, disappearing rapidly.

II) Bricks and Timber; load bearing engineering bricks with timber joists used in the construction of the flat roof. Mainly used in low-income areas of some small towns and villages, but disappearing fast, also for the reason of safety concerning earthquakes.

III) Bricks and Steel; load bearing engineering bricks with steel beams used in the construction of vault roof. This method of construction has been the most popular form of house building in most parts of the country.

IV) Steel Framed Structures; structural steel used in the construction of the building frame and bricks or blocks used as infill materials in the walls and ceilings. Mostly used in the construction of multi-storey residential and commercial buildings.

V) R.C Framed Structures ; reinforced concrete used in the construction of the main frame with bricks, blocks or other prefabicated components used in walls and ceilings. This method of construction, although conventionally has been employed in larger scale developments, has recently become popular in residential buildings as the result of shortage of structural steel.

In order to illustrate the extent of the use of each building technique it is necessary to look at the data relating to the use of various building materials in the capital, Tehran (Ghanbari Parsa, 1987). Table 6.1 illustrates the gradual departure from the use of traditional styles of building towards more modern materials. This trend can be shown more profoundly if we search still further into past decades. Data released by the Statistical Centre of Iran, based upon the general buildings and population census of 1966, reveals that the percentage of buildings built before 1956 using traditional materials and techniques, ie mud /mud bricks, and timber, was 86.6%. This percentage changed during the decade of 1956-1966 to 75.5%, and declined further between 1966-1976 to 31.8% (National Census of Housing and Population, Iran Statistical Bureau, 1976).

Table 6.1. The type of materials used in projects developed by the private sector in Tehran in the late 1970s.

YEAR	MUD & MUD BRICK	BRICK & TIMBER	BRICK & STEEL BEAMS	STEEL FRAME / R.C FRAME
1975	.4	6.5	69.4	17.5
1977	1.1	5	59.9	29.2
1978	.6	4.8	60.3	28.4
1979	.2	3.4	67.8	25.3

Source: M.H.U.D First Five Year Programme (1982/3 - 1987/8) of the Islamic Republic, 1983.

This change has been more rapid in the urban centres to the extent that only 20.3% of houses built in 1966-1976 used indigenous materials; this has been confined to the lower income areas of the cities. It can be said therefore that as urbanization increases, so does the tendency towards modernity and the use of more modern building techniques. The important factor behind this is the social mobility of people, who migrate from rural areas to urban areas and also from smaller

towns to larger cities. Table 6.2 illustrates the further decline of the more traditional building techniques in favour of more modern construction techniques in urban areas of Iran in 1977.

Table 6.2 also reveals that by 1977 the construction of buildings using mud and mud bricks and timber had stopped all together in Tehran and the majority of buildings had used the more modern framed techniques. When analysing the data it can be seen that the change in the trends of building technology reflects the economic progress which is felt in society, especially by the middle class. After the events of 1979, brought about as the result of economic crisis, there was a halt in the production and distribution of many products and imports; this was felt particularly in Tehran. The reduction in the volume of imported building materials, specially structural steel and cement, meant that more people were turning to the use of bricks; Table 6.3 illustrates this point.

Because the reduction in the import of foreign products and the partial distribution of wealth following 1979, there has been a general move towards a more modest trend in property development. The trend has been the construction of smaller houses (density and floor area). However, the private sector still did not show any real interest in the use of more modest materials and building techniques.

Table 6.2. Distribution of buildings by the type of building materials in urban areas of Iran in 1977.

LOCATION	MUD& MUDI BRICK	BRICK WITH TIMBER	BRICK WITH STEEL JOISTI	STEEL FRAME/ R.C FRAME
Tehran	-	-	23.3	76.6
Large cities	0.1	3	80.9	14.4
Small towns	2.7	10.3	70.8	5.5
All urban areas	1.1	5	59.9	29.2

Table 6.3. Distribution of residential development by the type of building materials in urban areas of Iran in 1979.

LOCATION	MUD& MUDI BRICK	BRICK WITH TIMBER	BRICK WITH STEEL JOISTI	STEEL FRAME/ R.C FRAME
Tehran	-	-	49.7	50.2
Large cities	0.1	2.1	78.3	18.2
Small towns	0.6	7.6	74.4	9.7
All urban areas	0.2	3.4	67.8	25.3

Source: Plan and Budget Organisation, 1977 and 1979.

In fact, according to the data compiled by the Central Bank of Iran of all the planning permits issued for the construction of new dwellings in all regions, almost 100% of those issued in 1979 were for brick buildings. This trend was visible even in the towns of Yazd and Taftan, where traditionally earth architecture is prominent. Based on the results of surveys, 153,305 building permits for the construction of 160,792 buildings were issued by all the municipalities in Iran in 1985, which were for a total land area of 52,995,449 sq m. for the net floor area of 30,167,696 sq m. The data shows an increase of 5.4% for the number of building permits issued, 10.3% for the land area and 10.5% for the floor area, compared with that of 1984 data.

Of the overall number of building permits issued in 1985, Tehran Province, with 12.4%, has the largest share, and then Isfahan Province with 10.3%, Khorasan province with 9.5% and East Azarbaidjan with 7.8% of the share, rank second to fourth respectively. At the same time Ilam province issued the least number of planning permits, accounting for 0.6% of the total permits issued nationally. In the urban areas of the country (except Tehran) the type of building materials used in the construction process form 94.7% for structural steel and bricks, 2.5% for timber and brick, 1.6% for steel framed and

reinforced concrete bildings, 0.02% for mud and mud brick and 1.2% for other types of materials.

The data in Table 6.4 reveal that the type and extent of materials' usage is different in different provinces, depending on the type of climatic conditions of the region involved. For example, in Gilan and Mazandaran provinces, the extent of the use of brick and timber and in Isfahan province the extent of the use of structural steel and reinforced concrete is more than in other provinces. However, in recent years the use of framed building techniques, and particularly reinforced concrete, has been most in fashion. This popular trend has caused a widespread shortage of cement and reinforcement steel. With the nature of the planning system and the development control procedure as discussed in Chapter Three, the existing method of monitoring and issuing building permits could influence the use of materials or building techniques in different regions.

At present the development control system is concerned primarily with the enforcement of city planning regulations with regard to the height of buildings and the density and provision for adequate parking space in both residential and commercial buildings. As explained in Chapter Three, the municipalities are in charge of issuing building permits and development control. It would be an obvious assumption to advocate the use of municipalities to enforce the implementation of building regulation, playing a similar role to the local authorities in Britain. But with the existing structure of the municipalities in Iran and the insufficient number of technical personnel at their disposal, they would be unable to resume responsibility for this task. The following section will provide an analysis of the affect of market conditions on the choice of technology.

6:3.2.2 Market Conditions and Cost Implications

Under pressure from the international market and world-wide inflation, the prices of raw materials and other imported products have increased rapidly in recent years. Whilst this price increase is expected for imported materials, the price increase of non-steel products which are mostly produced in the country has been greater. The price index of construction materials in four years between 1974 to 1978 had a 51.3%

Table 6.4 Information of building permits issued by municipalities in different provinces of the country with relation to the type of materials used 1361-63 (1983-85).

PROVINCE	Total permits issued No	The No of buildings- materials type				
		brick steel	brick timber	S frame & R.C	mud & brick	other
COUNTRY.....	153305	134249	3519	2231	34	20759
Tehran.....	19044	6024	1	102	0	12940
Markazi.....	7981	8461	0	3	0	0
Gilan.....	3861	1610	1827	85	3	370
Mazandaran.....	6380	4799	1355	42	0	230
West Azarbaidjan.....	11974	12566	34	66	1	9
East Azarbaidjan.....	7672	7211	84	90	0	307
Bakhtaran.....	4300	2508	25	63	1	1703
Khoozestan.....	14856	14114	1	57	0	684
Fars.....	9717	9109	42	50	23	493
Kerman.....	8755	8142	25	166	0	422
KHORASAN.....	15402	15360	15	26	1	0
Isfahan.....	15861	15144	42	674	0	1
Sistan & Baluchestan.	3174	2982	1	7	1	183
Kordestan.....	1828	1755	1	72	0	0
Hamedan.....	4438	4216	3	105	0	114
Bakhtiari & C.Mahal..	2248	2146	9	90	0	3
Lorestan.....	5948	5744	10	194	0	0
Ilam.....	1001	804	15	91	0	91
Kohgilouyeh & B.Ahamd	1199	416	0	4	0	779
Boushehr.....	2135	463	1	35	0	1636
Zanjan.....	5006	4991	4	11	0	0
Semnan.....	2578	2560	0	18	0	0
Yazd.....	2632	2619	1	2	4	6
Hormozgan.....	1494	505	23	178	0	788

Source: Information on Planning Permits issued by Municipalities of the country in 1985. Ministry of Plan & Budget, Iran Statistical Centre, Report No 955, November 1985.

increase, which in the case of steel products was 17% and non-steel materials 89.1% (M.H.U.D 1983). During the two years of 1979 and 1980, to begin with the percentage increase was slow, rated at only 2.9% per annum, mainly due to the price increase of steel-based materials. At the same time the price of other materials actually declined by 0.4%. In the following year, as the result of universal inflation and also an econo- mic embargo imposed on Iran, the price of steel products rose by 22.8%, and the overall price of materials increased by 23.3%. This clearly shows that during a period of 6 years, ie 1974-1980, the price of building materials doubled. This high rate of inflation has a considerable effect on the price and availability of construction materials and hence influences the type of technology employed. When the price of certain materials, such as structural steel and cement, increases rapidly as the result of high demand and limited supply, it does not usually take long before there is a change in the construction patterns. The following table illustrates the fluctuation in the price of steel based and non-steel materials. The price fluctuation of steel products, is however, affected by the international market, whilst other materials which are produced inside the country follow the internal market factors such as supply and demand.

Table 6.5. The fluctuation of the price index of building materials. 1974=100.

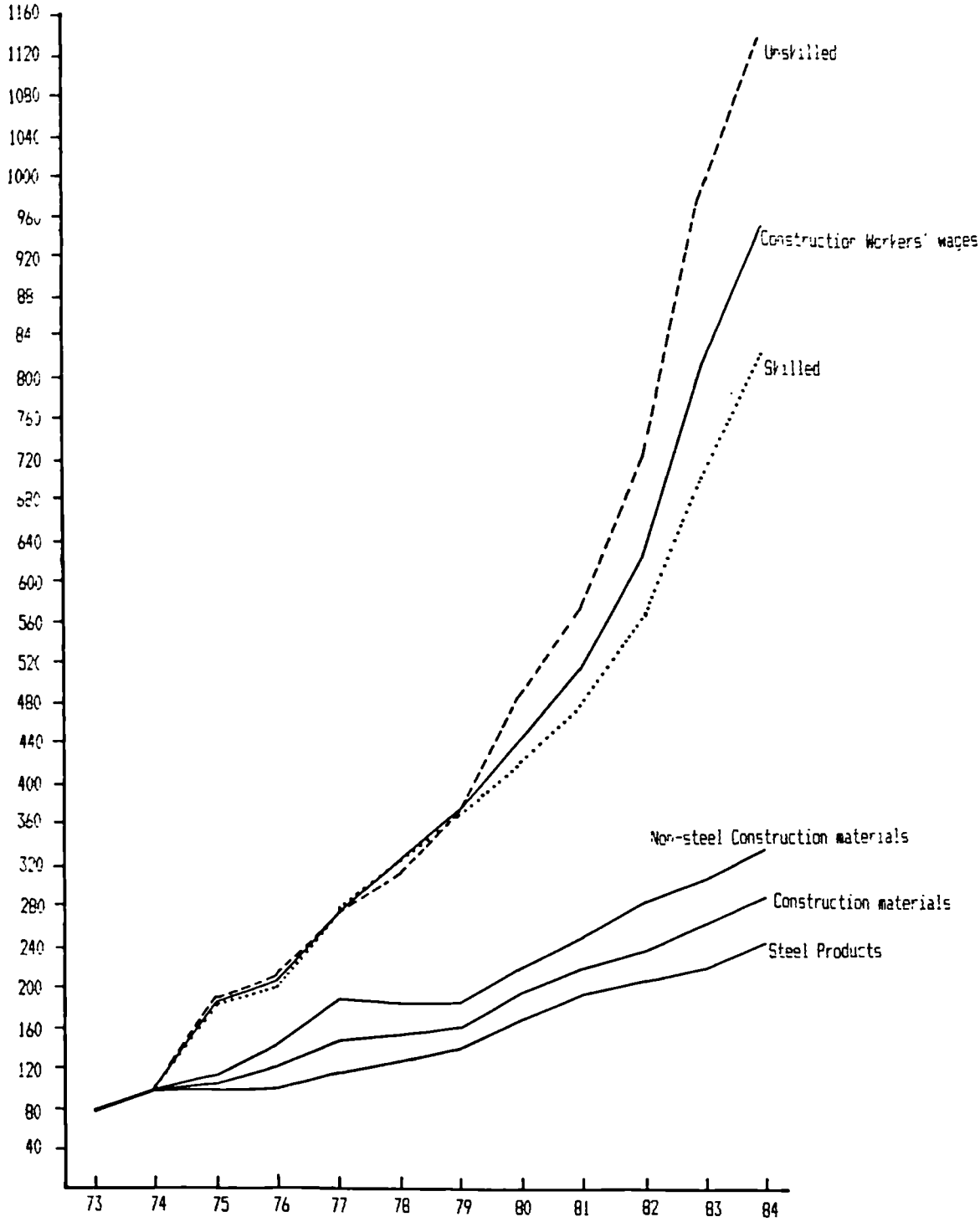
YEAR	ALL MATERIALS	STEEL PRODUCTS	NON-STEEL PRODUCTS
1972	64.0	62.2	66.9
1973	77.9	77.5	78.7
1974	100.0	100.0	100.0
1975	105.2	97.9	113.3
1976	120.6	100.5	143.0
1977	151.3	117.0	189.1
1978	156.0	129.2	185.7
1979	164.1	141.7	188.9
1980	199.2	173.5	227.7
1981	224.6	197.5	254.4

SOURCE: M.H.U.D 1983.

For example, in 1979, as the result of the sudden upsurge in the use of brick in house building, the price of this product rose sharply making the finished cost of a brick building increase by 36.5% (per square meter) whilst the cost of steel-frame buildings declined by 4.6%. Another important factor influencing the construction cost of buildings using a particular technique against another is the labour contents of the technique used. In recent years the level of wages of construction workers has increased rather dramatically compared with the cost of other components of the industry (Diagram 6.1). For this reason in many parts of Iran, where traditionally labour-intensive construction methods were used, people have tended to gradually adopt alternative construction techniques requiring less labour input. Although it has always been assumed that it would be cheaper to build houses using mud and mud-bricks, in effect it is now cheaper to use engineering bricks in Iran. This is due to the fact that when building with mud and mud brick, the cost of transporting the mud to the site and then the making of the mud-bricks on-site pushes the construction costs higher even in the rural areas.

Between 1979 and 1988 the country was involved in a war and also experienced countless natural hazards, which affected the production capacity of many factories including plants producing building materials. The resulting affect has been a shortage in supplies and the emergence of black marketeering. Other shortages in the supply of some materials are quite often caused by a disruption in the distribution system. Currently there is a country-wide rationing system in operation to guarantee low-prices for essential materials and keep down the rate of inflation. The system works in the following manner. All contractors who work on government contracts are eligible to purchase materials at official price from distributors provided they have authorised purchasing letters issued by the client. Other people, before embarking upon construction of any project, when applying for a building permit (planning permits) are allocated a certain limit which the planning officers determine they need for the project. The system clearly has both advantages and drawbacks. The advantage is that people on a low income can afford to proceed with house building. Amongst the shortfalls is the creation of a black market for the items most scarce. Table 6.6 illustrates the dramatic price differential between the government and private prices of a number of building materials or components (Abkaii, 1988).

Diagram 6.1: Construction indexes, 1973-1984.



Source: Bank Markazi Iran, Appraisal of changes in economic activities after the Revolution, Tehran 1983. and Iran Statistical Centre, Various Annual Reports, 1983, 1984.

Table 6:6. Difference of Government and Market Prices for Building Materials and Components in Iran in 1988.

Description	Government Prices (Rls)	Market Prices
Reinforcement Bars, including cutting, bending and installation/Kg	76	455
Steel Joist, including, cutting and welding/Kg	66	470
Steel Angle, including, cutting and welding/Kg	66	840
Steel Plate, including, cutting and welding/Kg	66	470
Door & Window made of Hollow Steel Sections/Kg	137	1400
4 mm Glass including installation/ sqm	930	5750
+ inch tap with istallation	450	2700
4*6 cable including installation per m	196	780
Flourecent light fitting per (double) unit	4260	12500
Russian formwork board/cub m	30000	215000
4 Kg Immulsion paint	850	10000
Shock-absorbant 5/ each	21800	62000
Single Light-Switch	265	1350

Source: Abkaii, 1988. "Housing and Problems of its Provision". Sakhteman, No.3, p34.

6:3.2.3 Changing Aspirations and the Process of Technology Transfer

Peoples' aspirations change as the result of standards set by society. In order to understand why, in many parts of Iran, both in the large cities and rural areas, we see rapid changes in both the appearance and the structure of buildings, both residential and commercial at almost all income-levels, one must try to address the factors that affect this process. On a general front it seems that trends take shape originally at the international level and with the present day's communication revolution it does not take a long time for this to be spread around the world. In earlier discussions on the Crash Housing Programme, it was shown that United Nations' advisors in fact promoted the use of prefabricated and industrialised building systems in Iran.

At the national level standards are set in the form of prestigous developments when national development is devised by the planners, designers and implementors. Prestigous developments are usually both government and private sector, commercial and residential projects. Figure 6.7 is an example of speculative commercial development by the private sector in Mashhad. Figure 6.8 shows an upmarket joint venture between the private and public sector comprising luxury apartments with on site shopping and leisure facilities in Mashhad city centre. The private sector always invests in the high return, upper end of the property development market (Figure 6.9). Government financed projects are often prestige ministry buildings and mass housing programmes (Figure 6.10). The private sector usually follows in the footsteps of the government when developing residential projects for middle and upper middle income sections of the population. In smaller cities standards are set through a technology transfer process from the primate city. Often government offices and other government backed projects set an example by introducing new and modern building techniques both for commercial and low-income residential developments. Buildings of this nature usually include government offices, police stations, schools, high schools, health clinics and various other buildings which are used as the main service centres for people at large. Quite often institutions, including banks, which are engaged in real estate development and management as part of their overall activities, act as a vehicle for introducing new technologies and materials to many

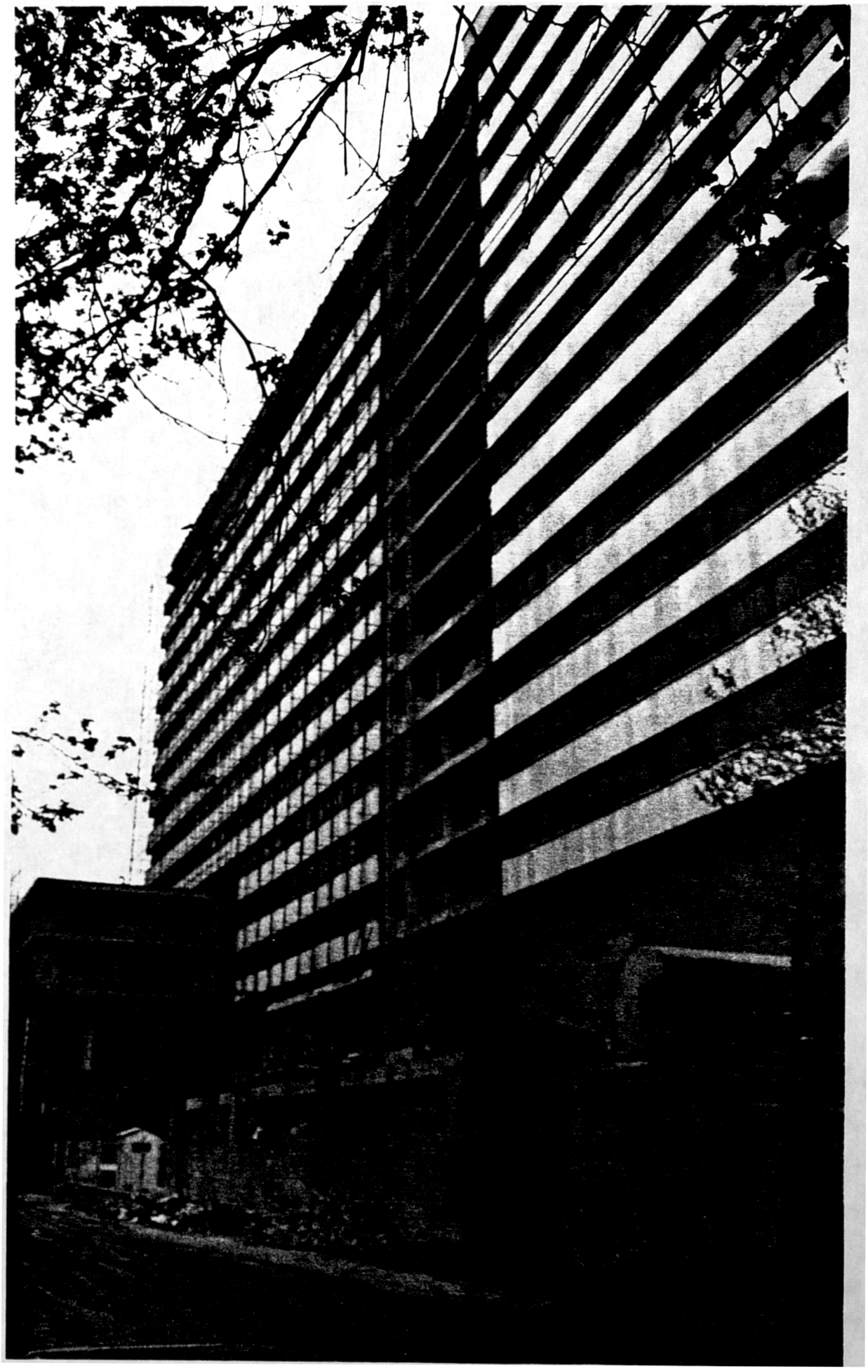


Fig. 6.7
The construction of this development which commenced in the mid 1970s was halted because it violated the Mashhad Municipality's planning regulations concerning the permitted building height. The construction method however resembled that used in Tehran.



Fig. 6.8

This project shows the type of investment which is often carried out by private sector in luxury development. Such development often employs the most modern construction technology.

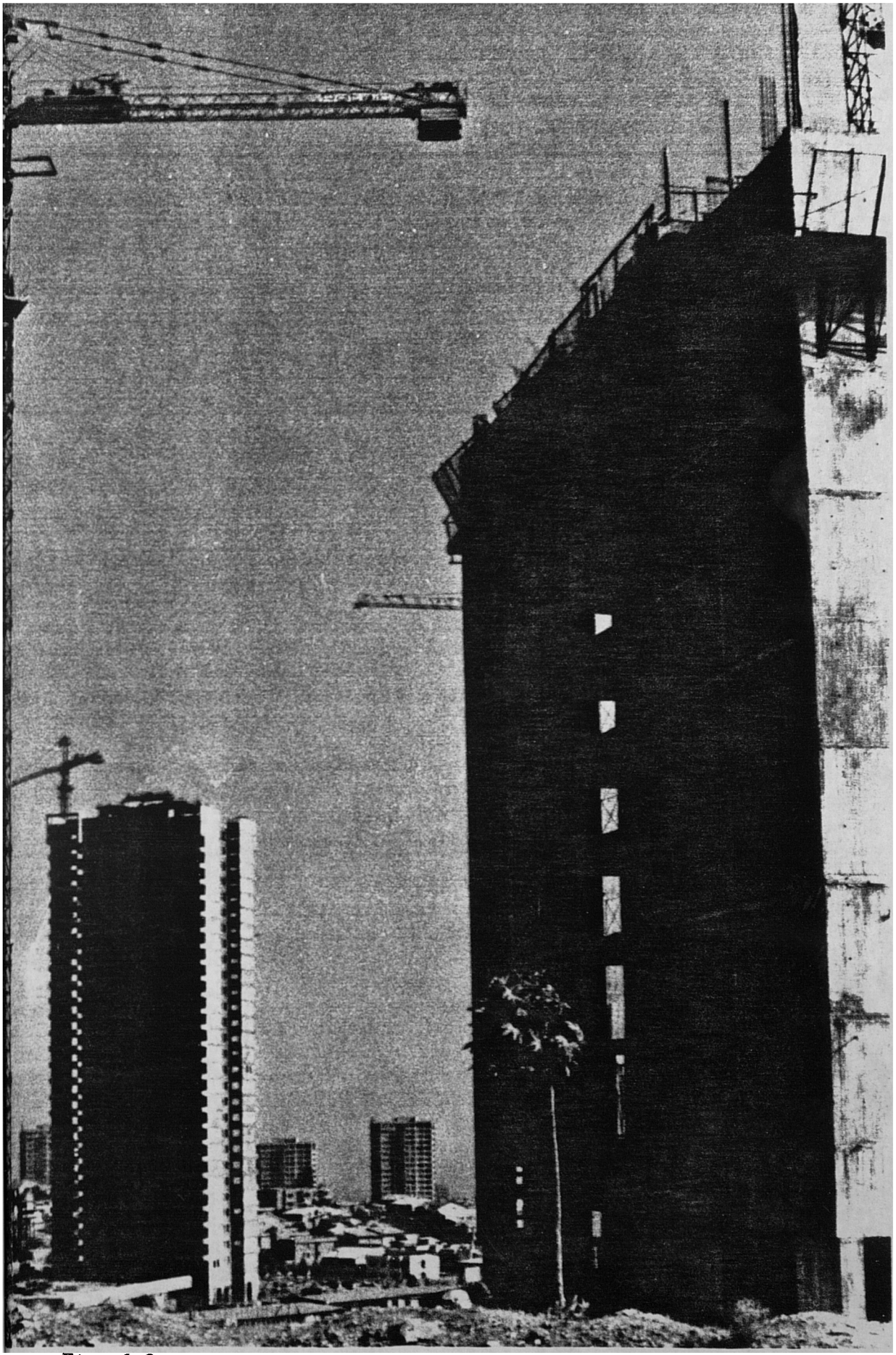


Fig. 6.9
The rapid high rise residential development of the 1970s came to a sudden halt as the result of the closure of imported production plants. Such unfinished projects were common in Tehran.

Fig. 6.10



Private sector investment in office and retail development in Mashhad. Note the matching height of the buildings. This is strictly enforced by planning regulations.

of the rural towns in Iran. This has undoubtedly contributed to a large extent to the shortages of strategic building materials as explained in Chapter Four.

During a field study carried out in July-August and September 1986 which concentrated on the work of a few private contractors on various projects financed both by the government and semi-public institutions, it was noticed that in almost all cases these firms were acting as the main agents for technology transfer in small towns spread over a wide area in the Khorasan region of Iran. In one particular case the project involved the construction of local branches of one of the largest banking groups in Iran. As part of their policy, the banks renew all their properties every few years and re-build them again in the most modern way; they consider that by doing this they preserve their prestige. In this case the contractor demolished the existing building which was built with load-bearing brick walls and steel beams in the construction of the roof (Ghanbari Parsa, 1987). This was replaced by a modern reinforced concrete structure which was the first of its kind in this small remote town. Soon after the start of the project the contractor was approached by various clients who wanted to engage his firm for building a few commercial and residential buildings using the same technology and materials. The same contractor has introduced modern materials such as factory produced facing bricks (imported from some 800 miles distance) and resin based facing materials. The contractor is now engaged as part of his business in purchasing and selling these materials to the local market. This illustrates the important role of institutions and contractors in technology transfer and changing standards.

Home ownership in Iran is very high, compared with many countries; for example, based on the survey of 1976, 70.3% of the families in Iran owned their own home (P.B.O 1976). The percentage in urban areas was 57.5% and in the rural areas 82.2%. During the same period, the number of families owning their own home in France was 31.5%, in Italy 50.2%, Portugal 44.5%, U.K 43.9%, West Germany 35.3%, Sweden 36%, Switzerland 33.7% and the U.S 62%. The main reason for this high percentage rate of home ownership is the prominant religious and cultural factor. Also the high cost of rented accommodation is significant. In urban centres around 28% of the people lived in rented accommodation. In the majority of cases people build their own houses according to their own requirements and

income. This is the main reason that one can find a great diversity in the standards of finishes amongst the housing stock in all parts of Iran. Most of the house construction in Iran is carried out by the private sector; most people build their own houses while the government housing activites cater for government employees.

As self-built house construction is an on-going process, it usually takes a few years (World Bank 1977), so it has room to adhere to the trends in the property market. For example, when the construction operations commence usually the owner has a clear mind about the building technique and style, whether employing steel frame or R.C frame technique. The house in figure 6.11 took almost three years to be completed. The photograph was taken in 1986, showing the structure that was just completed with reinforced concrete frame and brick infill walls. Once the structure is weather-proof, if he has the funds, the owner can embark on the finish, usually determined by the current trend, whether it is a marble facade or another finish. otherwise he occupies the house and postpones the finishes to the time when he has the ability to finance the works involved. Figure 6.12, taken in 1988, clearly proves this point, as it was two years later that the owner had the means to complete the building, in this case choosing special marble which is particularly popular as a facing material.

All people build their house with the current value and standards set by the housing market. This is in fact a certainty, because usually people purchase a plot of land, say the average 400-500 sq meters, then they divide it in two and build two houses. One house is for their own use and the other unit is sold. In this way they get a return on their investment which is the cost of their own house. It can be said that the housing sector is one part of the construction industry that has the greatest effect on the economic well-being of a country and the population at large (Van Huyck, 1980 and Turner, 1980), housing being one of the basic needs of every individual which reflects the living standard and the social prestige of the owner. The amount of investment in the dwelling, the way it is built and the technology used are all indications of one person's economic power and to an extent it highlights the individuality of the person concerned (Turner, 1976). It is a common experience world-wide that the opinions and prejudices of a building's users, and of the local community, about the type of material to be used will exert a very

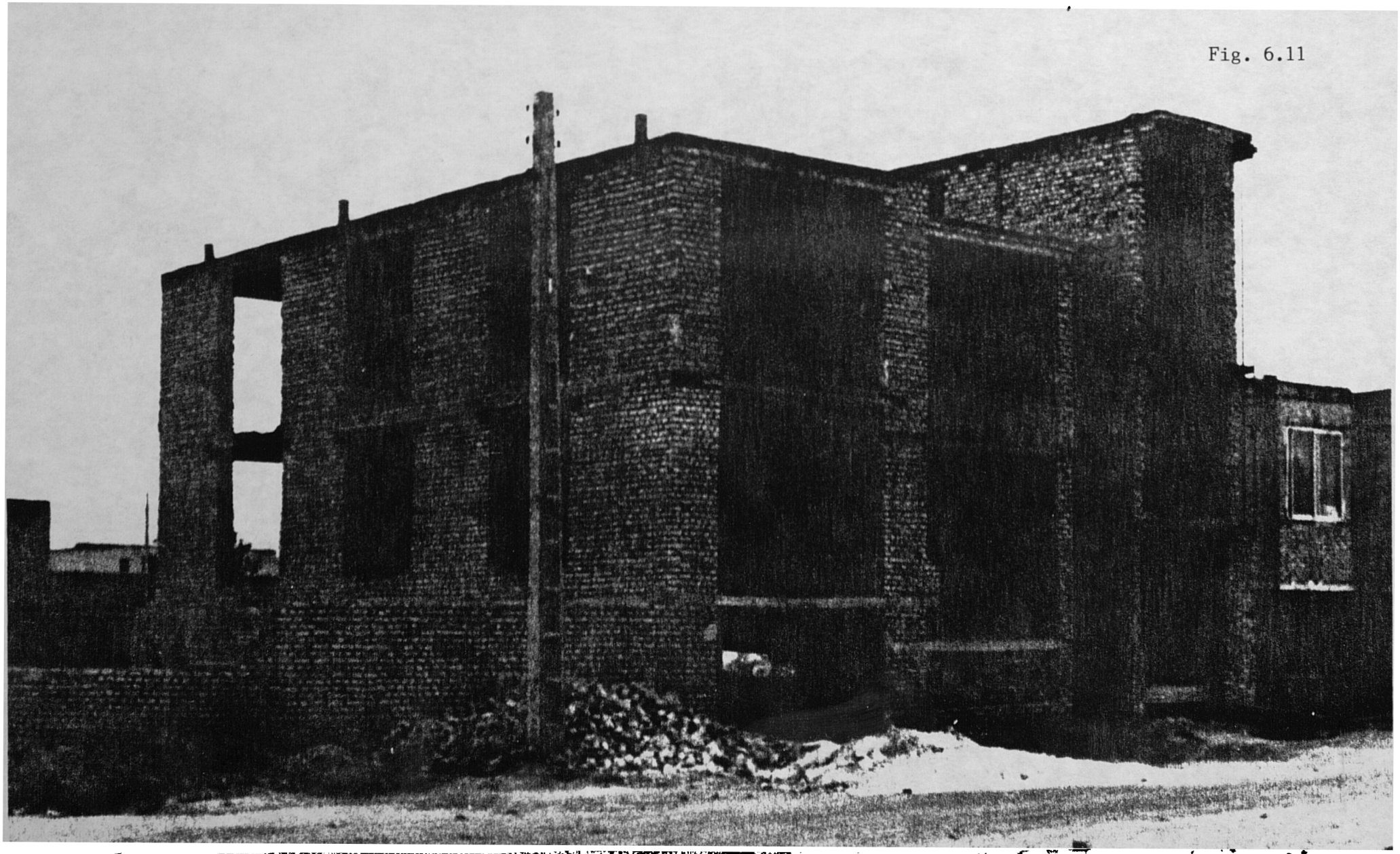


Fig. 6.11

The self build housing process. The construction of this house commenced in 1985. This photograph shows the stage of development in 1986.

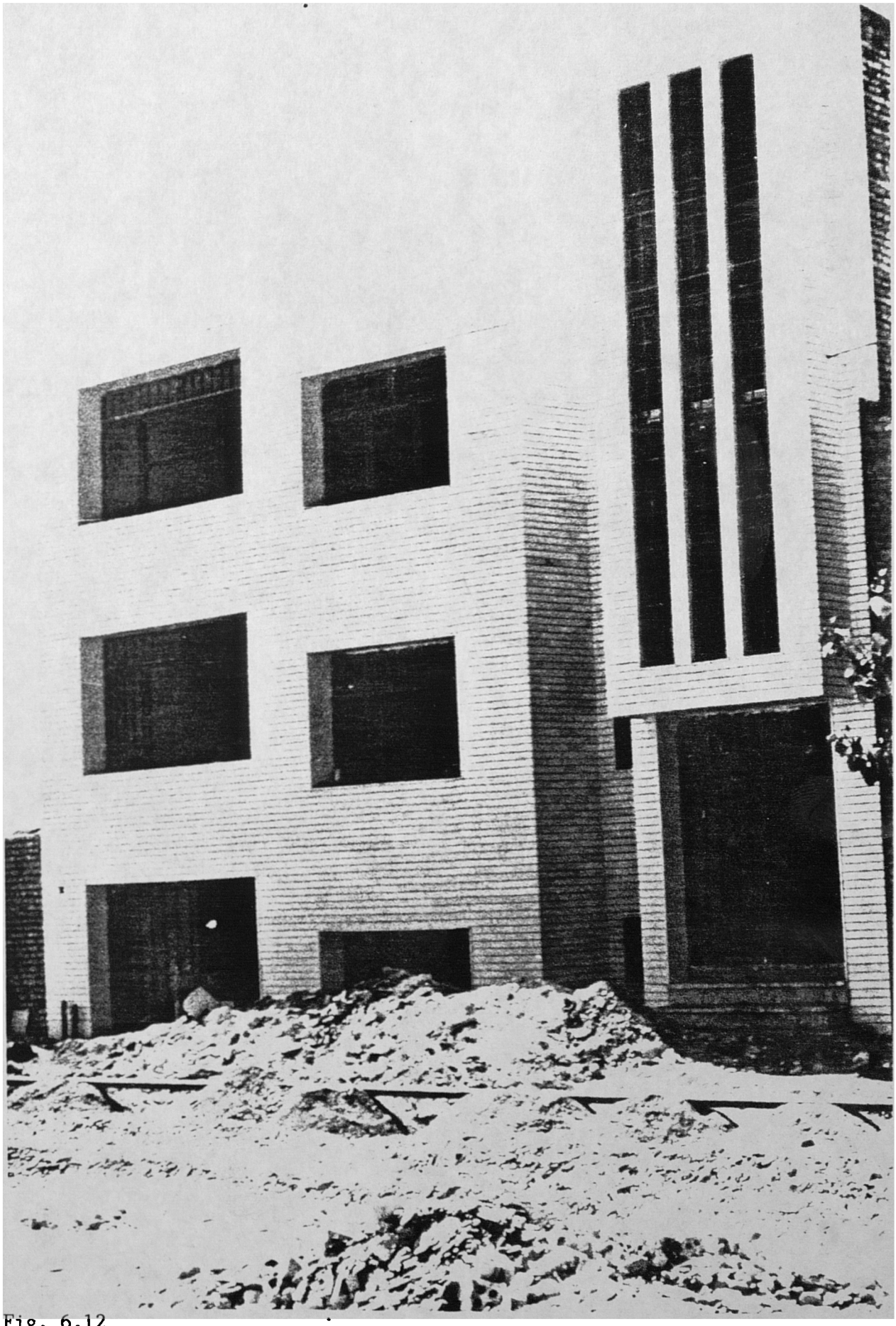


Fig. 6.12
This photograph shows the stage of development of the house in Fig. 6.11 in 1988. Note that by this time the external finishes have been completed. One of the apartments in the house was already sold.

powerful influence over the choice of material, often to the extent of dictating in some detail how the building will be built (Spence, 1983).

The choice will also depend on institutional factors, such as by-laws and standards or the requirements of financing agencies which may either dictate or prohibit certain forms of construction. Another mode of exemplifying this type of planning or legislative action can be found in much of the 1970s development in the central areas of Mashhad and a number of other cities. In the 'conservation' zones of the city, where there occurred some "street widening", in order to blend the new development with the remaining set of monumental buildings any person who wanted to build either a commercial or residential development had to use a specific type of brick with other decorative elements built in. The building in figure 6.13 is a good example of planning in action in Mashhad. In this case the height of the building, i.e. the number of floors, and the choice of facing materials are strictly controlled by the local planning codes. This exercise has spread to other areas of the city where there are no planning rules dictating such requirements even after a decade.

The same pattern of development swept through many parts of the world during this period. The 1980s trend of office and residential property market, especially in the United Kingdom, has seen the revival of steel structure and external glass curtain walls. In most of the high-tech development in the London Docklands this method of construction is in use. The reason for this trend is political. In discussions with a number of planners and officials at the L.D.D.C offices it was mentioned that their brief is to choose a fast method of construction which would produce speedy results and also give the impression of high-technology and a modern image in order to attract national and international investment. For the construction of the Canary Wharf proposed office development, fast-track construction methods and management techniques are employed for speedy completion (Personal Discussions, June 1989).

The existing organisation of the building industry, the size, the type and capabilities of the builders and their own interests will be another constraint, often a dominating one, on the choice of technology to be used. In order to solve the housing problems for the lower income sector and the rural

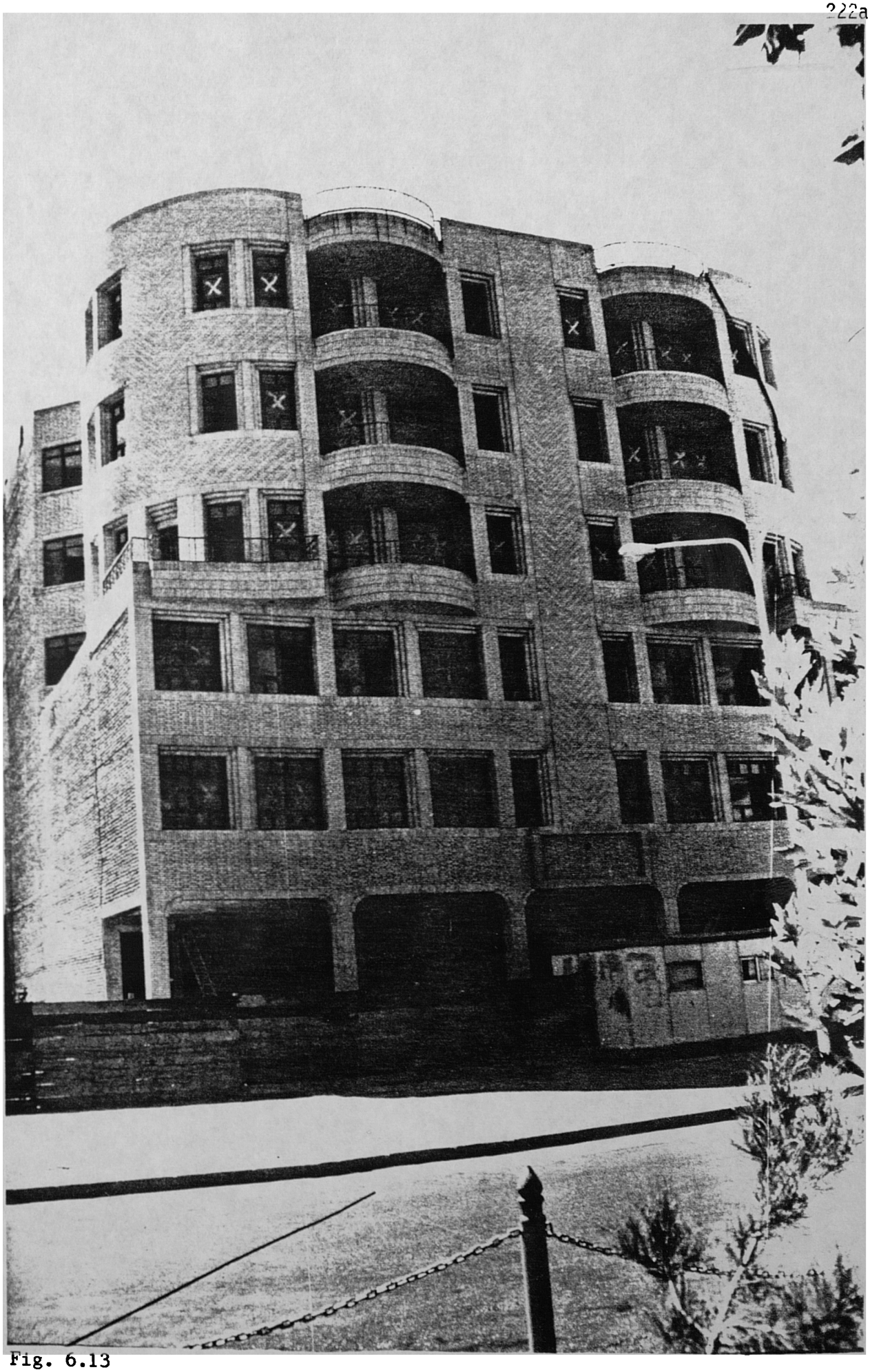


Fig. 6.13
Stiff planning rules dictate the height of the building and the type of external finishes in this particular part of Mashhad.

population the "Housing Foundation" was set up in 1979. The policy that the Housing Foundation has chosen for the reconstruction and development of the rural areas is based on the non-use of steel-based building materials. Instead the policy is based on maximising the use of concrete where necessary, the use of the traditional vault-barrel dome technique, specially adpated to withstand earthquakes, and also use of timber and other locally produced materials. The Housing Foundation, as part of its duties, has set out to change the building styles and methods of construction in the rural areas which are at present based on imported technology and materials (Maskan va Enghelab 1985). The government is facing difficulties in this task; this frustration is expressed in an interview which the Deputy Head of the Housing Foundation gave to one of the magazines concerned with the issue of housing when he stated that;

> "One of the problems that 'we inherited from the previous regime' is the fact that the whole traditional style of architecture and building, both in the urban centres but more importantly in the rural areas, were changed and replaced with imported foreign architectural style and building methods". (Maskan va Enghelab 1985)

He continued by saying that because of the consumerism which found its way to Iran, especially since the 1960s, the society has inherited serious problems. In his words prior to this event, from a technical point of view also, the vernacular house was better suited to the geographical and climatic conditions. In the hot arid areas, with the inclusion of "wind-catchers", the house was ventilated and cooled. The general tendency towards the modern building form has resulted in that even when you travel to the remote parts of the interior desert you can witness steel-structure dwellings which are standing in the place of the traditional thick walled dwellings which were much more suitable for desert conditions. With the advent of the steel framed building method in Iran the foundations for our dependence on imported technology and materials were set (Table 6.7).

In his view this has been the worst disaster that could have happened in the Iranian building industry. By looking at table 6.8 containing data of the use of various building materials in the rural areas of the country it, seems that the Housing Foundation official has a valid case. It is a fact that the

Table 6.7 Distribution of rural house-holds in the provinces in relation with the use of major building materials, in 1983 and 1984.

Type of / Material / / PROVINCE	Total 83/84	S.Frame & R.C 83	S.Frame & R.C 84	C.Block 83	C.Block 84	Brick/stone steel 83	Brick/stone steel 84	Brick/stone timber 83	Brick/stone timber 84	Mud/Mud Brick & timber 83	Mud/Mud Brick & timber 84	Tent/ similar 83	Tent/ similar 84	others 1984
COUNTRY.....	100	0.3	-	2.7	3.3	8.0	8.5	12.2	11.4	73.1	71.9	3.7	3.3	1.6
Tehran.....	100	2.6	-	1.1	2.4	46.3	49.7	11.6	10.5	38.2	36.1	0.2	-	1.3
Markazi.....	100	0.1	-	0.2	0.3	8.0	7.1	3.3	5.2	88.4	87.1	-	0.3	-
Gilan.....	100	-	-	16.1	25.3	0.5	0.5	15.7	6.2	67.7	67.4	-	0.3	0.3
Mazandaran.....	100	0.4	-	10.0	10.5	1.9	3.1	29.6	26.6	57.8	57.2	0.3	0.4	2.2
E.Azarbaidjan.....	100	-	-	0.2	0.4	1.6	3.1	13.7	16.9	84.4	78.2	0.1	-	1.4
W.Azarbaidjan.....	100	-	-	1.2	1.5	5.6	5.9	16.3	21.2	76.9	71.4	-	-	-
Bakhtaran.....	100	-	-	1.8	-	3.2	5.5	13.6	5.5	80.9	85.0	0.5	-	4.0
Khoozestan.....	100	-	-	4.8	4.7	15.9	14.8	19.0	13.2	52.8	50.2	7.5	3.4	13.6
Fars.....	100	-	-	2.5	2.1	12.0	11.8	15.0	11.6	67.7	68.2	2.8	2.8	3.5
Kerman.....	100	0.8	-	2.7	2.1	4.2	7.0	11.7	10.2	66.2	65.0	14.4	14.3	1.4
KHORASAN.....	100	0.4	-	0.6	0.5	6.6	5.3	4.9	3.1	87.4	89.8	0.1	0.9	0.4
Isfahan.....	100	-	-	0.6	1.0	18.4	16.4	3.7	3.9	76.7	77.6	0.6	0.8	0.3
Sistan+Baluchestan.	100	-	-	0.2	0.5	1.2	1.2	1.9	0.9	68.0	71.3	28.7	26.1	-
Kordestan.....	100	-	-	-	-	-	0.9	12.9	1.2	87.1	96.3	-	-	1.6
Hamedan.....	100	0.2	-	-	0.3	6.1	8.5	4.7	3.2	88.2	87.0	0.8	-	1.0
Bakhtiari & C.Mahal	100	-	-	0.6	1.1	1.5	3.8	7.7	10.0	90.0	82.4	0.3	1.2	1.5
Lorestan.....	100	-	-	-	0.2	7.3	8.0	10.5	12.2	79.1	74.8	3.2	2.6	2.2
Ilam.....	100	-	-	-	-	8.6	7.9	27.1	37.1	50.0	40.0	14.3	15.0	-
Kohgilouyeh+B.Ahamd	100	-	-	-	-	21.7	20.6	44.4	48.3	30.0	23.9	3.9	7.2	-
Boushehr.....	100	0.6	-	2.2	3.1	3.3	6.3	35.8	38.0	56.7	50.6	1.4	0.6	1.4
Zanjan.....	100	-	-	-	-	4.7	5.3	3.4	2.5	91.9	91.8	-	0.2	0.2
Semnan.....	100	-	-	-	-	14.7	19.7	5.0	3.6	80.3	76.7	-	-	-
Yazd.....	100	-	-	0.9	-	14.2	14.1	1.8	0.9	83.1	84.1	-	0.5	0.4
Hormozgan.....	100	0.3	-	12.1	13.2	-	1.3	13.7	28.4	49.7	40.0	24.2	17.1	-

Source: Investigation of the housing conditions of rural and urban areas of Iran in 1983 and 1984. Internal publication of Iran Statistical Centre, The directorate for building and housing statistics, July 1986, Bulletin No 1.

Table 6.8 Distribution of typical urban house-holds of differnt provinces with relation to the use of major building materials in 1983 and 1984.

Material type / PROVINCE	TOTA	Steel/ R.C frame		concrete blocks		brick/ stone & steel		brick/ stone & steel		Mud/ Mud brick & timber		Tent/ similar	
		83	84	83	84	83	84	83	84	83	84	83	84
COUNTRY.....	100	2.4	2.1	3.4	3.2	47.5	48.0	20.7	22.9	25.7	23.5	0.3	0.3
Tehran.....	100	11.2	9.1	0.3	0.2	82.8	81.9	4.3	5.3	1.2	2.3	0.2	0.2
Markazi.....	100	0.2	0.2	-	-	61.9	54.0	8.4	20.9	29.5	24.9	-	-
Gilan.....	100	0.9	1.7	29.6	27.2	9.2	6.6	40.9	43.3	19.4	21.2	-	-
Mazandaran.....	100	0.2	-	9.2	9.7	17.5	20.5	54.2	45.4	18.9	24.3	-	0.1
East Azarbaidjan.....	100	0.6	0.8	0.8	0.2	30.5	33.1	39.5	48.3	28.6	17.6	-	-
West Azarbaidjan.....	100	0.5	-	-	0.9	34.4	32.1	47.0	48.4	18.1	18.6	-	-
Bakhtaran.....	100	1.5	2.2	-	-	41.2	38.8	40.8	51.9	16.5	7.1	-	-
Khoozestan.....	100	0.3	-	2.0	1.0	79.9	86.2	11.4	5.0	6.0	7.5	0.4	0.3
Fars.....	100	4.4	2.6	1.7	0.9	45.6	50.4	16.6	20.2	31.7	25.4	-	0.5
Kerman.....	100	1.0	1.4	0.6	1.0	38.5	41.9	7.8	7.2	49.6	47.4	2.5	1.1
KHORASAN.....	100	0.3	-	1.0	0.1	57.1	56.6	18.2	25.1	23.9	17.8	0.4	0.4
Isfahan.....	100	2.8	3.1	0.3	0.4	46.9	46.9	10.4	8.9	39.6	40.5	-	0.2
Sistan & Baluchestan.	100	0.5	-	4.0	4.0	31.7	31.7	5.0	7.7	56.0	54.4	2.8	2.2
Kordestan.....	100	-	0.4	1.9	-	23.5	24.5	33.5	39.4	41.1	35.7	-	-
Hamedan.....	100	1.7	2.0	0.7	1.0	40.4	36.5	23.5	26.0	33.7	34.5	-	-
Bakhtiari & C.Mahal..	100	-	-	-	-	24.4	29.1	15.3	17.4	60.3	53.5	-	-
Lorestan.....	100	-	0.2	0.6	-	55.4	58.2	17.4	17.0	26.6	24.6	-	-
Ilam.....	100	0.4	-	0.4	-	55.2	63.0	35.3	35.3	8.7	1.7	-	-
Kohgilouyeh+B.Ahamd..	100	-	-	3.8	3.1	80.0	90.0	15.0	4.4	1.2	2.5	-	-
Boushehr.....	100	3.5	7.0	8.3	13.7	22.4	21.3	59.3	57.3	6.2	0.7	0.3	-
Zanjan.....	100	-	-	-	-	47.0	47.9	19.4	28.6	33.4	23.5	0.2	-
Semnan.....	100	-	-	-	-	46.2	42.7	3.0	6.3	50.8	51.0	-	-
Yazd.....	100	0.2	-	-	-	29.7	27.3	0.6	0.6	69.5	72.1	-	-
Hormozgan.....	100	1.1	2.2	49.3	46.6	4.6	9.8	11.4	17.5	32.9	23.5	0.7	0.4

use of structural steel in buildings in Iran is far more than in other countries. There are other factors which further influence the process of the choice of technology, particularly the location of the site where the development is to take place. In this instance the value of land would have a dramatic impact on the available resources.

6:4 Land and Property Development

The housing sector is mostly affected by market forces and the house is a sound form of investment as it insulates the owner against inflation. It is the conditions of the market forces which determine indirectly the way houses are built and sold in order to get their full value. The property market affects the general trend of the economy; in the past two decades it seems that the issue of land speculation and the resulting situation has had a major effect on the well-being of the Iranian economy.

Land issue has been one of the main headaches of the government in Iran, both before and after 1979. In the 1970s land speculation was so buoyant that a high inflation rate was brought about so the then government had to act and put a halt to all land purchases within the city boundaries (Table 6.9). Although this move worked to some extent, it was not successful mainly because wealthy speculators purchased land outside the city boundaries and initiated large scale expensive upper market housing schemes, usually in collusion with the planning authorities (M.H.U.D 1983).

Both during and after 1979 social upheaval because of the break down of government control and an unknown quantity of land was taken over by ordinary people or some powerful people in both urban and rural areas. But there was widespread squatting on land, which was carried out by landless low income people. This was mainly done in the classic manner when families would occupy land and mark a plot over night and commence construction of dwellings.

As the result of this action there emereged a wide ranging diversity of housing stock built according to different needs, much of it sub-standard housing in the periphery of cities.

Table 6:9. The fluctuation of land prices in some cities of Iran.

(The fourth quarter of the year-price per square meter).

NAME OF CITY	1976		1977		1978		1979	
	Min	Max	Min	Max	Min	Max	Min	Max
Tehran	3000	250000	6000	100000	5000	50000	3000	12000
Abadan	300	13000	1000	11000	600	18000	600	18000
Isfahan	3100	39000	3500	30000	3500	29000	1500	15000
Ahvaz	600	25000	2000	28000	2000	28000	500	17000
Oroumieh	1500	15000	1400	13000	2000	15000	1000	10000
Arak	2200	15000	2500	14000	1000	18000	900	9300
Tabriz	1500	22000	1500	24000	2000	20000	1500	25000
Rasht	1500	30000	2750	35000	-	-	1500	6000
Sari	800	10000	800	10000	1000	10000	1000	5000
Shiraz	2200	25000	1700	19000	3000	20000	1500	18000
Kirman	300	5000	400	6000	450	6000	400	3000
Mashhad	1200	1000	1200	1000	1500	15000	1000	7000
Hamedan	900	12000	1000	13000	750	8000	500	6000
Yazd	400	20000	400	12000	700	12000	350	13500

Source: M.H.U.D, The Five Year Housing Programme 1983-1987.

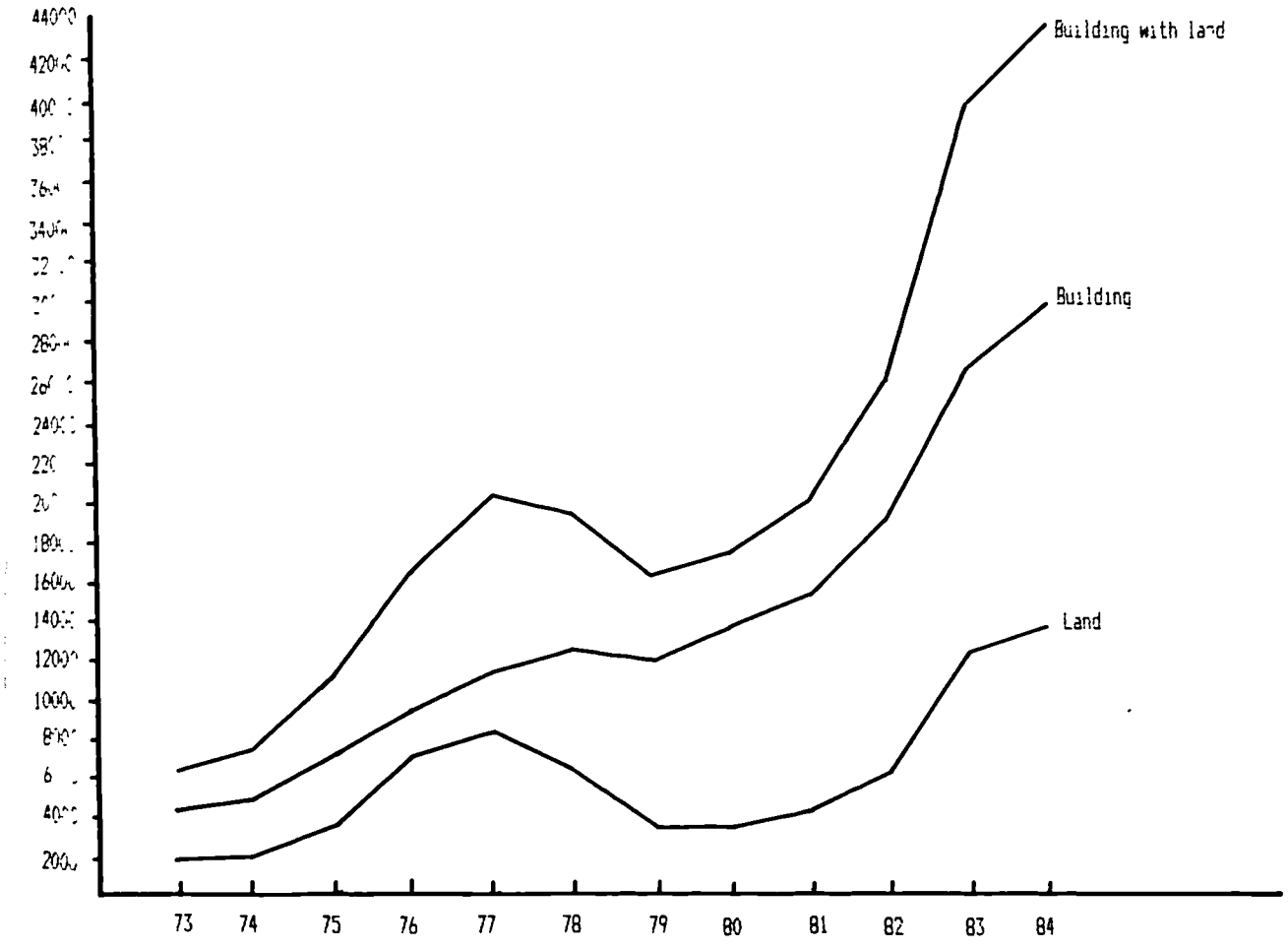
Another turn of events which was initiated by the government in the aftermath of 1979 in order to satisfy those who demand-

ed a better deal for mainly low-income people in the urban centres, was a policy of land allocation to landless people. This caused a sudden wave of migration of people from the rural areas to cities in search of free land, and it had unimagined affects on the country as a whole. Faced with enormous difficulties by their decision the government had to act and introduce more rigorous conditions for land allocation. During 1982 and 1984 there was a surprising construction boom despite the war economy, and this again gave rise to land speculation and a very active property market which pushed the rate of inflation high.

The land prices rose sharply in 1984 and 1985, causing serious economic problems for the government. This made the government act and they suspended the sale or purchase of land in all cities, bringing to a halt the construction boom. Land cost forms a significant proportion of house construction cost (Diagram 6.2). This in turn affects the type of building and how it is going to be built according to location and price of the plot. Usually when the land is situated in a prime city centre location the property developed comprises ground floor commercial premises and the upper floors of either office or residential apartments. In these cases the type of technology used for construction puts an added value on the property. In the case of lower income areas, those people who manage to get access to land have already spent much of their capital on the land purchase, thus experiencing shortage of capital. This affects the technology they use. Also the actual construction will take longer to be implemented, as illustrated in figures 6.11 and 6.12.

The following table (Table 6.10) illustrates the cost contents of land in residential units in urban areas. The unavailability of data regarding the land price fluctuation in recent years makes it impossible to make a more accurate analysis of the impact of land cost on the property development market. Once again the experience of the 1970s and the implementation of some of the policies regarding the Crash Housing Programme specially that of high rise apartment buildings for different income groups, depend much on the availability and cost of land. The scarcity of land and the high cost contents was one of the reaasons for high rise buildings in order to achieve higher density land use in different parts of urban centres. For example, in 1977 the Tehran Municipality introduced a ruling that set ceilings on the floor space of new housing,

Diagram 6.2: Average price of land and cost of constructed unit per square meter, 1973-1984.



Source: Bank Markazi Iran, Appraisal of economic activities after the Revolution, 1983. and
Analysis of the activities of private construction sector in urban areas of Iran, 1983, Tehran 1984 & 1985.

100 square metres for apartments and 200 square metres for villas, and in 1978 it stopped issuing permits for the construction of housing complexes with large individual floor areas and banned the start of all construction work in Tehran for the following nine months. Similarly, in the post 1979 years, as the result of the introduction of new land bills regarding land ownership in the urban areas, the government has limited the ownership of land for each individual to 1000 square metres (U.L.O 1986). At the same time the Urban Land Organisation favours higher density land use in the urban areas and thus allocates smaller plots to the applicants for low cost land.

Table 6.10. Price of land and its share in the cost of residential units built by the private sector in urban areas.

Area of the plot= 1000sq meters.
Price unit = million Rials, Rs120= #1.00.

YEAR	NO OF DWELLINGS	AREA OF LAND	COST OF PLOT	PRICE PER/m	SHARE OF THE COST*
1973	83628	16374	33544	2094	45
1974	80255	17487	45016	2547	49
1975	101357	18956	78795	4157	46
1976	101686	17764	129569	7294	49
1977	119172	20895	174513	8352	47
1978	150059	24358	158841	6521	40
1979	163779	27034	104117	3851	28
1980	180094	33876	126872	3745	27
1981	130598	26370	124714	4827	29

* The share of land cost of the whole construction cost (%).

Source: M.H.U.D 1983.

Apart from the impact of the different factors that have been mentioned on the type of technology chosen for the implementation of either public works' programmes or house building activities both by the public and private sectors, there was

another unwanted important factor which will have a long-term impact and major effect on the construction technologies, especially in the urban centres. This was brought about as the result of continuous air and missile attacks on the civilian targets during the so-called "war of the cities". The resulting impact has been the demand for more durable building materials and more resistant construction technics.

6:5 The Long Term Impact of the Crash Housing Programme

The "Crash Housing Programme" had long-term implications for the construction industry in Iran, both in planning and technological aspects. The planning aspects have already been discussd in the previous parts of this chapter. However, before concluding this chapter it is important to take a closer look at the Crash Housing Programme from the technological aspect, in order to establish the lessons which can be drawn from such an experience for countries such as Iran.

Mention has already been made that a United Nations' advisory team was commissioned by the Ministry of Housing and Urban Development in order to prepare an evaluation of the building systems. It was also mentioned that the same team was commissioned by the Building and Housing Research Centre to act as their advisors. The UN team quickly prepared a specification for the "Crash Housing Programme" which became, as McCutcheon describes:

> "this booklet became the popular manual of the foreign companies which came to undertake design and construction tasks in Iran". (McCutcheon, 1979 p388)

After evaluation of a number of previous work, thirty-three systems of the same number of foreign companies were selected and invited to tender for work (Konye & Pajevic 1976). Of these six companies were recommended to the Mortgage Bank of Iran. The UN team specifically recommended the following systems;

IMS: Institute for Metal Testing and Research in Belgrade (Yuguslavia)

No-Fines Building Systems: Wimpey (UK)

Tunnel Shuttering Systems: Outi-Nord ; Batimetal (France)
Tracoba (France); Peva (Hungary)

Lightweight Concrete Systems:
Siporex- Gas Concrete
Foam Concrete- Iporitbeton (WG)
Cheecholite (UK)
Light Weight Aggregates:
Serama (F), Stiropor- W Germany
ETI- Hungary

Large Panel Prefabrication methods: Florio & Costa Magna (F)

BRE Cast System: BRECAST- The UK Building Research Establishment system, supposedly devised for the needs of developing countries. (Cited in McCutheon 1979)

According to McCutcheon (1979, p389), the systems recommended by the UN team were exclusively concrete based for multi-storey construction and the buildings exhibited by the Construction Bank at the Tehran 1976 International Trade Fair were based on the timber frame or sectional house approach, rather similar in concept to Operation Breakthrough in the USA (US DHUD 1970). The Crash Housing Programme created a golden oportunity for many companies from a wide range of countries to export their unwanted products to the Iranian market. It seems that almost all industrialised and prefabrication systems in the world found their way to Iran in the hope of capturing lucrative contracts. The Americans alone were to provide twenty prefabricated housing factories in order to construct 100,000 apartments, five hospitals and other buildings (US DHUD 1976).

The above account clearly states how in a relatively short time the Iranian planners, with the expert advice of the United Nations' team, laid the foundations for the long term dependency of Iran on foreign technology, expertise and materials. This also signals how the process of technology transfer takes place at the international level. The long term implications of such a strategy for development have been significant both from economic and cultural points of view. It is also important to mention that in its entirety the "Crash Housing Programme" was a failure despite the large volume of invest-

ment and all the political pressures. The programme had envisaged that 200,000 houses would be completed before March 1978, whereas they had barely been started. Once again Iranian planners seem to have expected miracles to occur.

The dependence on foreign technology became evident once these companies stopped their operations in Iran due to the 1979 political events. As the reult of the shortage of raw materials and lack of expertise, most of these factories had been standing idle since 1979 and some of them were in limited operation produced paving slabs (MHUD 1983). This is a painful tragedy for Iran and other countries in the same situation where billions of dollars of public capital were spent on importing such factories in order to alleviate the housing shortage, yet they ended up producing paving slabs or other simple building components which could be produced by simple machinery. The post 1979 era has inherited a situation where, because of the imported technology of earlier times and the programme of industrialisation, they have had to once again spend vast sums of scarce foreign exchange in order to reactivate the same factories, thus asking the same manufacturers to return to Iran and modernise and revitalise these production plants. Figures 6.14 and 6.15 show examples of prefabricated apartment building in Mashhad and Tehran. Figures 6.16 and 6.17 show the use of prefabrication methods for new commercial development in the Qasem-Abad project near Mashhad, where the imported technology package includes both the prefab system and the machinery and trucks for the transportation and assembly of the components. Prefabrication can offer speedy construction for retail and commercial development, as shown in figures 6.18 and 6.19.

One of the justifications for the adoption of the industrialised building system was the basis of cost saving which was, however, unsound. This is due to the fact that prefabrication and industrialised construction systems were far more expensive than the existing steel frame and brick infill building sytem. Due to the commitment of both the political system and, unfortunately, the planners and implementors, the construction of traditional dwellings was prohibited in the major cities, in the 1970s, by architects and engineers who were trained in industrialised countries.

The following section will provide an overall conclusion of issues discussed in Chapter Six.

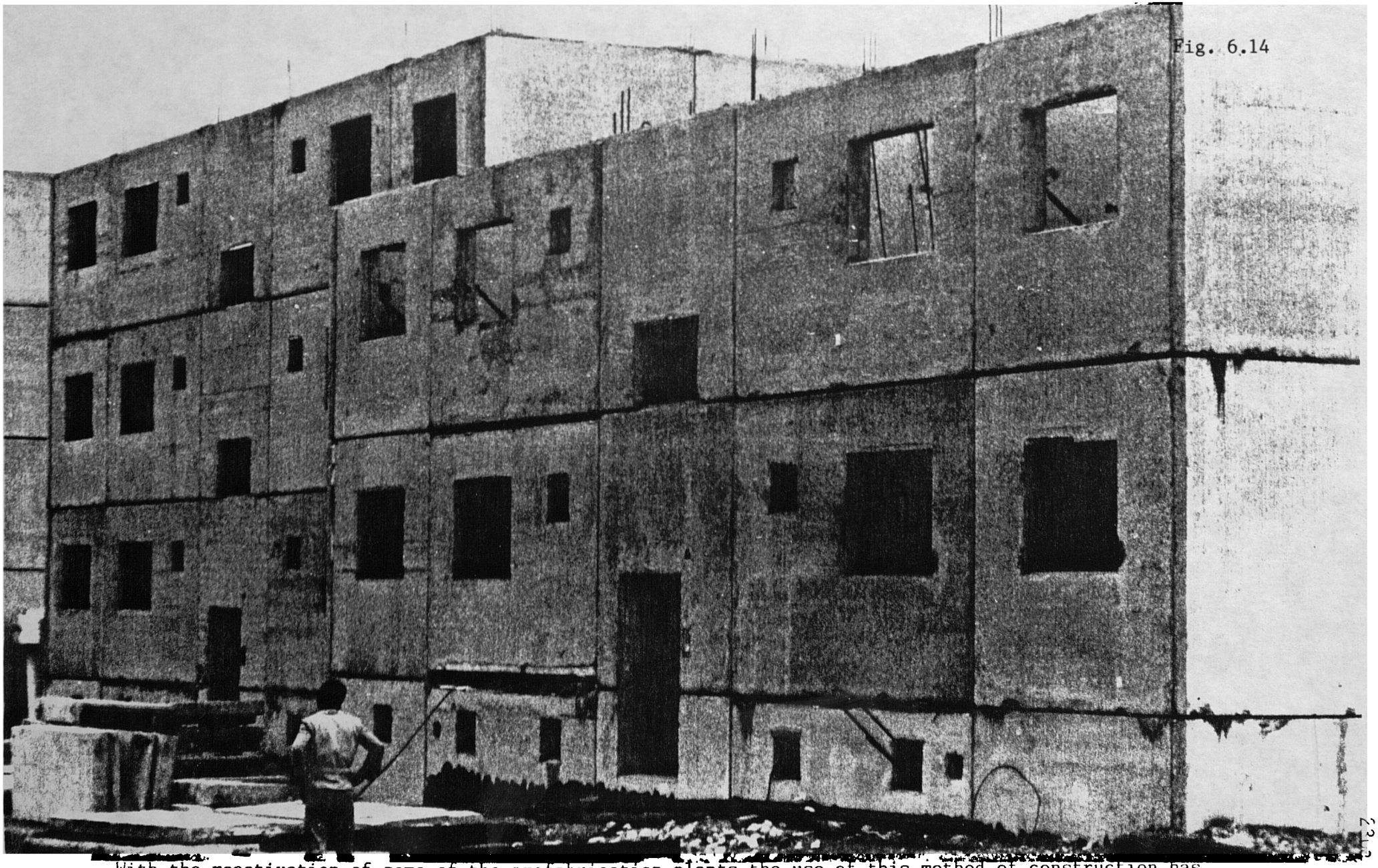


Fig. 6.14

With the reactivation of some of the prefabrication plants the use of this method of construction has flourished again. This project is under construction in Mashhad.

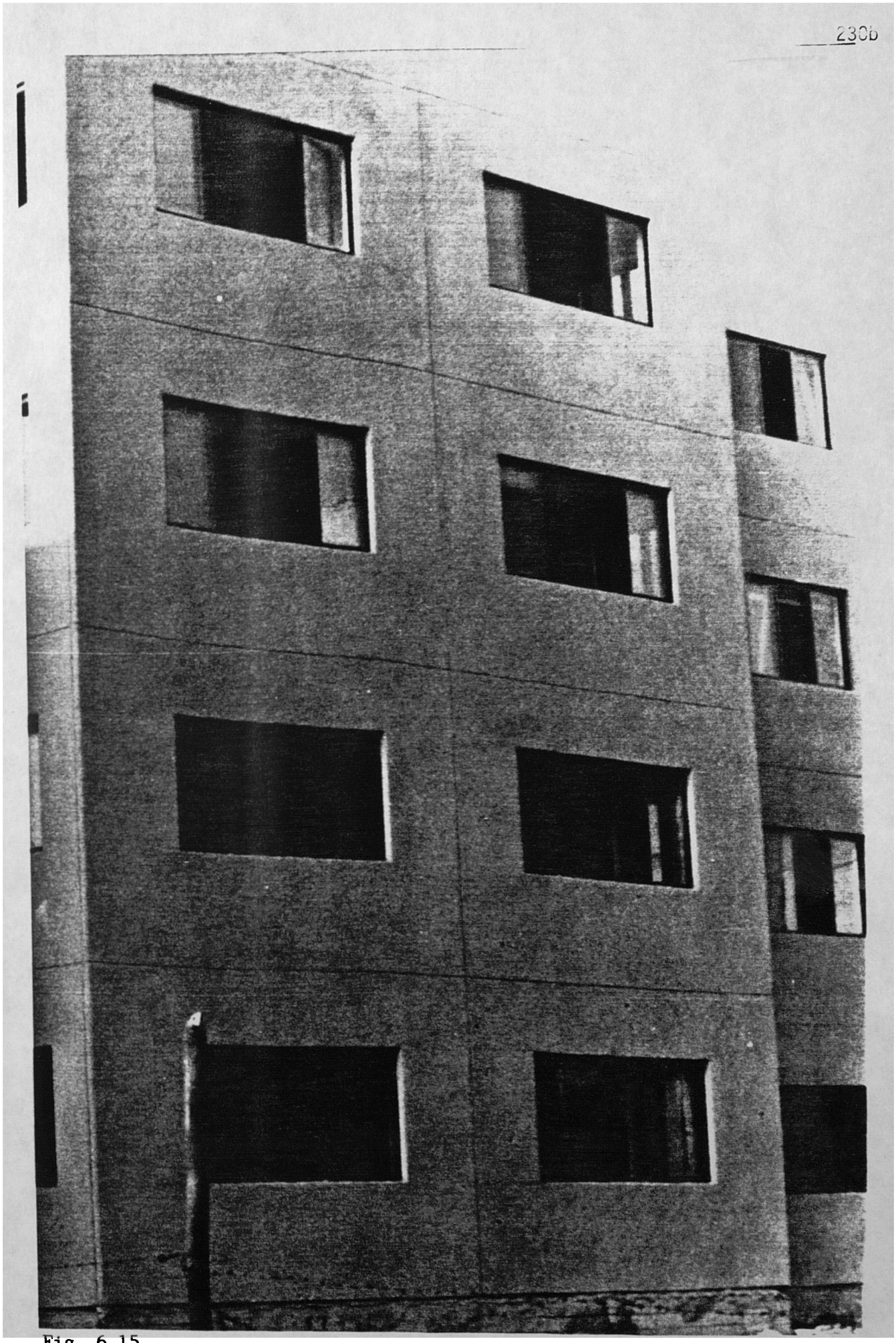
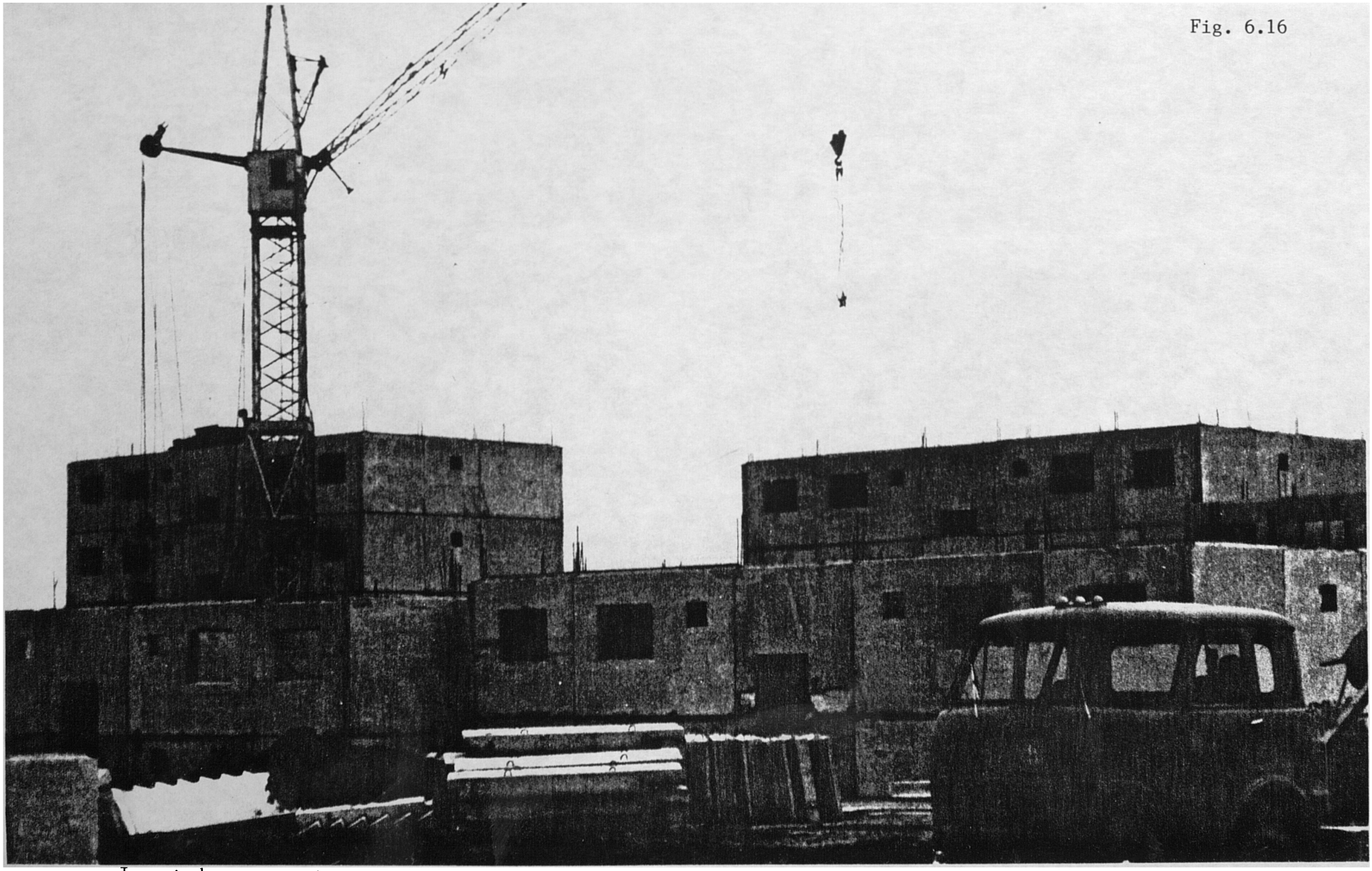


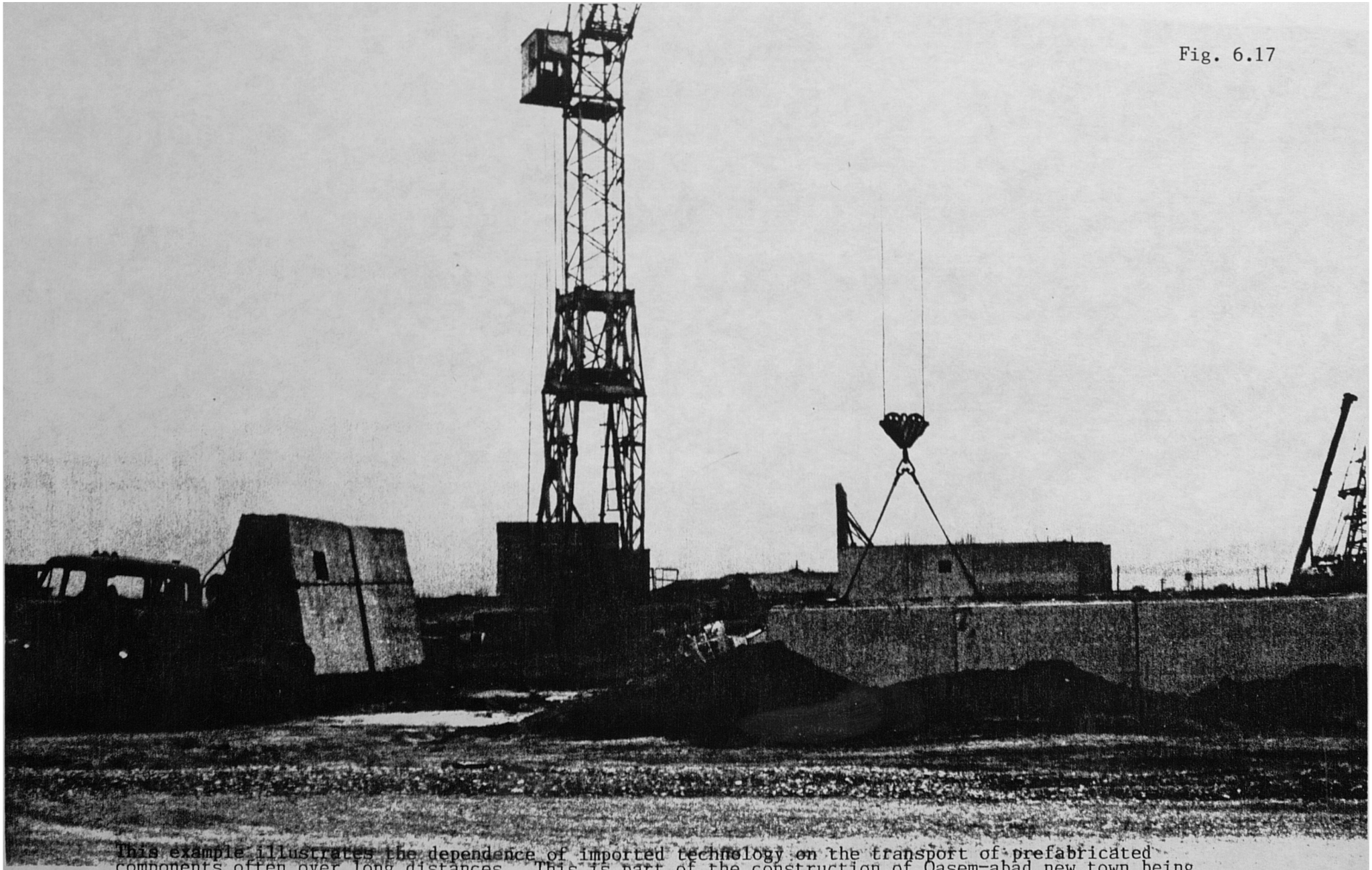
Fig. 6.15
The photo shows a recently completed residential development in Tehran. The process of technology transfer is often encouraged by public sector investment in different cities.

Fig. 6.16



Imported construction technology and use of prefabrication plant also involves the use of imported construction machinery and transport vehicles. This example is in Qasem-abad new town near Mashhad where prefabrication is used for government buildings.

Fig. 6.17



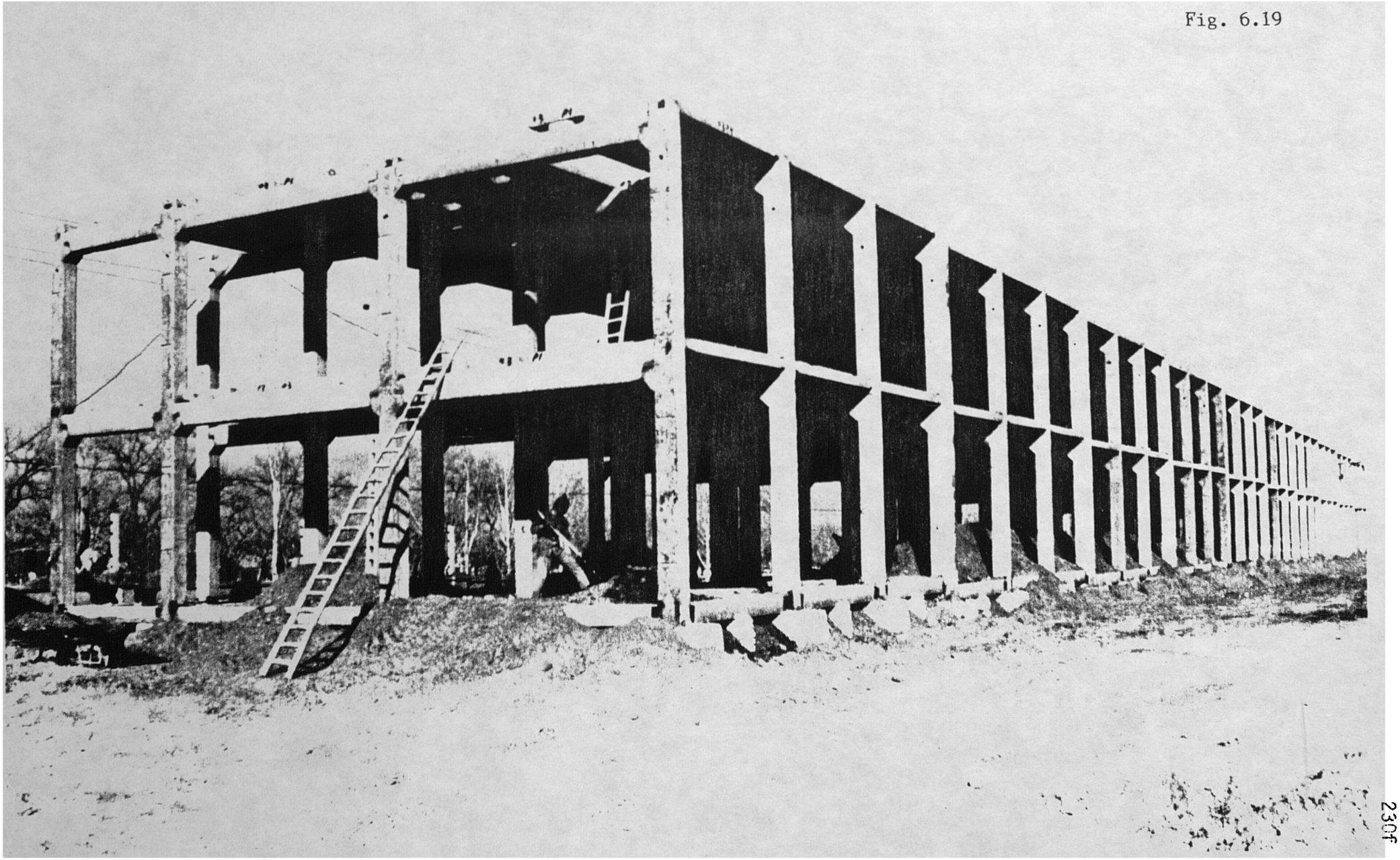
This example illustrates the dependence of imported technology on the transport of prefabricated components often over long distances. This is part of the construction of Qasem-abad new town being developed based on the idea of partnership between government and private sector for low income housing!

Fig. 6.18



Better quality prefabrication can offer speedy solution for private sector non-residential development. The photograph shows the use of such methods in Mashhad.

Fig. 6.19



Use of prefabricated construction technology minimises the use of abundant labour. This private development is near Mashhad.

6:6 Conclusion

In this chapter detailed discussions on the subject of construction technology transfer and its impact on the development process in Iran were presented. To begin with, an analytical account of the resource implications of development strategies set the scene for future debates as to the extent that decisions made on the basis of different strategies for development could undermine the outcome of development plans. By referring to the fact that development strategies, both before and after 1979, were aimed at industrialisation, it was argued that this goal has clearly failed to materialise. The reason for this failure were outlined as the use of imported technology for the creation of an industrial basis which was clearly inappropriate for Iran. An example of this failure was found in the form of the "Crash Housing Programme" introduced in the 1970s.

Also a number of factors were identified which influence the choice of technology, amongst them political and economic implications. The economic factors were assumed to be the need for higher commissions and consultancy fees on the part of the international consultants and contractors. Different examples were given in order to illustrate the way these economic interests are catered for, including the subsidy arrangements for post-war housing developments in Great Britain. This experience showed how the government encouraged the use of the industrialised building system in Britain with the advice of the National Building Agency which was influenced by the large manufacturers of such building systems. The political factors were clearly recognised in the Crash Housing Programme when in the 1970s the government took an active role in the promotion of industrialised building systems in order to create 200,000 houses in two years.

From the planning aspect it was shown how policies were adopted in order to encourage the building of apartment buildings by both the public and private sectors. Planning measures were taken in order to increase the density of housing in the urban centres and also to create a modern way of life for the low income groups in the cities of Iran, according to the Mayor of Tehran Dr Nik-Pay, in 1976.

Amongst other factors influencing the choice of technology,

social aspirations and market conditions were put forward. In order to examine this notion the result of a case study was presented which, amongst other issues, concerned the nature of construction technology transfer nationally and more, specifically, in an urban/rural context. In order to back up this hypothesis recent trends in building technology were examined and it was described how small contractors were acting as agents in introducing these technologies to the rural areas of the country where previously traditional methods of construction prevailed.

In examining the market conditions it was recognized that the fluctuation in the cost of different building materials such as cement, steel and bricks also played an important role in the use of one or other construction method. Mention was made of the fact that an upsurge in demand and use of a particular building method contributed to a shortage of some materials.

Amongst the cultural implications it was argued that people's aspirations change according to market conditions and trends. The fact that different standards are set by the government and society acts as a prelude to a process of technology transfer and the promotion of one or more modern construction technology and materials. The process of technology transfer was described in detail and the reflection of such a trend was further illustrated by looking at the housing sector of the construction industry.

By examining the nature of land and the property development process, it was argued that private developers and speculators set their own standards which catered for the higher income section of the population. It was shown in this context that land use planning can play an important role in the promotion of certain materials in designated zones such as conservation areas. Examples of this were given in cities of Mashhad and others when in the 1970s, by adopting planning regulations, the city municipality prohibited the use of certain materials in conservation areas of the city and insisted on the use of specific materials. Another aspect of land speculation was the impact it had on the choice of construction technology and the type of building materials used. As the land cost contents increased it was noticed that, at the speculative end of the market, the quality of the construction was affected, whilst the appearance of the buildings followed market trends.

Land ownership was recognised to be an important political issue in Iran and an issue which has not been addressed adequately so far. However it can be seen that with the introduction of a series of acts regarding land ownership, at least in the urban areas, the government has attempted to encourage a measure of controlled development, particularly in the field of low cost housing for low income groups, whilst enduring to attain higher quality houses.

This is in contrast to the Crash Housing Programme of the previous administration where an industrialised building system was seen to be the only way towards solving the shortage of housing, especially for low income groups. In the final parts of this chapter the long term technological impact of the Crash Housing Programme were discussed and it was shown that during the programme not only did the strategy of industrialised building in the programme fail in quantitative terms, but also it had serious consequences for the long term development of the country, with disastrous economic and political implications. Here it was demonstrated how inappropriate the advice of so-called international experts could be for the developing countries. Not only is this advice not given impartial of financial interests of big multi-national companies, but also it implies a measure of political consideration. Through the advice of the UN team regarding strategies for the implementation of the Crash Housing Programme, the long term dependence of the construction industry in Iran on foreign technology was guaranteed. The belief about the import of industrialised building systems to Iran and its portrayal as a tragedy for Iran, is reinforced by the fact that one of the international experts who was representing the Danish manufacturers, according to McCutcheon, accepted that industrialised building was not suitable for solving the housing shortage in Iran. Despite this belief he was ready to advise his Iranian counterparts on the use of such systems. As 90% of the production capacity of the Danish manufacturers was unwanted in Denmark, Iran presented a golden opportunity for exporting these products (MHUD 1976).

In the discussions on aspects of technology and its application to development, the author proposed, on the one hand, the necessity for appropriate technology and, on the other hand, that the causes for the unacceptability of such a technology were mainly economic and cultural considerations. However, it has been demonstrated that national development planning based

on the strategy of industrialisation has failed despite, three decades of planning in Iran. As Nowshiravani and Robert Bildner (1973) stated;

> "many foreign multi-nationals in Iran were barred by their parent companies from exporting their Iranian-made goods, nor did they attempt to train local staff to perform technical and managerial duties".

The same argument is supported by Rafii's study "Joint Ventures and Transfer of Technology to Iran: The Impact of Foreign Control". In his survey of thirty-five joint ventures in the manufacturing sector he found out:

> "With the effect of industry variations filtered out, a strong relationship emerged between foreign ownership and dependence on imports. Foreign managerial control was also associated with greater dependence on imports. Finished components, however, constituted a substantially higher proportion of the total imports of the high-foreign-control group than for the low-foreign-control group." (Rafii 198?, p205-237)

In the advocation of appropriate construction technology the use of traditional methods of construction and the use of mud or mud brick as the only way for achieving development goals was not encouraged. According to the definition put forward in Chapter Two, appropriate technology is the type of technology which is appropriate to the environment where it is going to be applied.

The methods of implementation and promotion of such strategies depend ultimately on the decision makers, planners and engineers. It has been highlighted that in most cases these standards have been set by the government, indirectly. Any discussion for the benefits of the use of appropriate construction technology in Iran or any similar country should recognize the need for the appraisal of the social aspirations of the people involved, as it is necessary for the successful outcome of any policy for the target population to be involved with both the planning and implementation of that policy. In the case of Iran this factor has never been addressed seriously in the past and present attempts are not pursued fully. At present there is a unique opportunity for the government in Iran to press the case for the promotion of appropriate technology.

This has come about at a time when the country has been affected by natural hazards such as earthquakes and floods, and also a devastating war. Within the next few years there will be an acute shortage of housing and great urgency for other development projects. This could only be achieved with realistic planning and foresight.

The construction industry in Iran has both the resources and the capacity to cope with this task, but the real motivation should be based on an institutional approach. The government's attempt at curtailing land speculation in the urban centres has been successful, and their aim of land allocation to landless low-income people on a gradual basis is a positive step towards solving the housing shortage. But it is also at this stage that policies can be implemented to encourage people to use resources and techniques which are readily available. On government backed development schemes, particularly in remote areas, people's participation could be sought with the use of their labour. As for the private sector, there is a need to createan atmosphere to attract investment into low-income housing. This could be achieved by financial incentives such as low-interest loans and training facilities for their personnel.

In the case of Iran the ultimate responsibility for such a failure must be attributed to such officials and the education system. Hassan Fathy (1973), in his remarks regarding the failure of the Gurna project, showed no hesitation in blaming the bureaucrats and the business community; the same is true in Iran as experienced by Nader Khalili (1983).

The following chapter will examine the Chinese experience of appropriate technology, and through examples an attempt will be made to determine whether such a strategy was beneficial to the development of the Chinese construction industry specifically, and the overall development of that country in general.

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CHAPTER 7

7.1 Introduction

The previous chapters gave an indication of the nature of development planning in Iran since the end of the Second World War. Various aspects of the process of planning and the construction industry were examined and it was argued that the choice of technology played an important role in the overall development of any society. Chapter Six in particular took an analytical view of the process of technology transfer and the way this is affected by the planning process. Since the early 1950s many developing countries have embarked on courses of development based on different strategies and ideologies. During this period another pattern of development was taking place in the Peoples' Republic of China. The level of development in China since the Communist Revolution of 1949 has been the subject of extensive work of experts from many countries. However, there has been special interest in the planning strategies adopted by Chinese Planners and the use of appropriate technology in the development of both rural and urban areas of that country.

This chapter, therefore, is focused on the following issues within the context of a centrally planned economy;

The impact of development strategies on the choice of technology;

The impact of planning policies on the choice of construction resources; and

The political and institutional factors affecting the planning and construction process.

This section of the work is written in the light of a visit to China in 1987 which involved a study of the use of Appropriate Technology in the construction industry. The examination of the Chinese construction industry will demonstrate how, with the adaptation of Appropriate Technology (A.T), it was possible to shape the development of both rural and urban areas. Various aspects and constraints of the industry from the point of view of resources and technology adaptation are also examined. The Planning Process within the context of Chinese Central Planning is examined in order to establish its impact on the construction industry at regional and local levels.

7.2 The general setting

China has always been singled out as one of the very few countries that has both experimented in, and promoted on a wide ranging basis, the use of appropriate technology. Indeed China has adapted appropriate technology very successfully in many areas of public life, both in rural and urban areas. Since 1949 much of the country's infrastructure has been built including numerous large scale projects for roads, railways, bridges, hospitals, dams, irrigation system, powerstations and industries. What concerns this work is the manner in which these projects were implemented.

7:3 The Chinese Experience with the use of Appropriate Technology

China's social revolution, partly by accident and partly by choice, was based upon the farming communities and the rural areas, and incidentally paved the way for what was probably the most significant innovation, or revision, in Marxist ideology since Karl Marx, "the recognition that the peasantry rather than the urban proletariat was the driving force for social revolution" (Singurdson, 1975). This accounts to a large extent for the fact that China's development goals, unlike those of many other low-income countries, were based to a large extent on the rural areas. The focus on appropriate technology with the emphasis it implies on decentralisation, local initiative and self-sufficiency, only reasserted itself after 1960, when the idealogical and technological break with the Soviet Union left China with no other option but to "walk on two legs" and "rely on its own forces", as Mao's most popular slogan declared. The difficulties experienced by China after 1960 and the way in which they were met, clearly suggest that a society's innovativeness, both in the modern sector and in the rural communities, can be greatly stimulated by adverse circumstances, and notably by the sudden interruption of the inward flow of foreign aid and foreign technology.

During the "Great Leap Forward", with Chairman Mao's motto that "our greatest wealth is our people", much emphasis was placed on the role of the people and the use of the masses for implementing various development projects. In fact this is

still the case even after the end of the cultural revolution when much of the blame for failure is placed on the latter.

7:4 Development Planning Policies

China was chosen as a base for a comparative study because of the fact that it has been a country which has been through various forms of destruction in its recent history. These included the opium wars with France and Britain, followed by the toppling of the last emperors (who pushed the country to virtual poverty), the war with Japan and the struggle for revolution through a long civil war. By the time the revolution was won the new regime inherited a country ravaged by the war, poverty stricken and infested with various diseases and a large number of drug addicted people. Within the framework of socialist doctrine the task of development took shape with "Centralised Planning" an integral part of it.

Development policies in China have been particularly determined by the ideologies pursued by the Communist Party, which came to power in 1949 after a long period of civil war and economic stagnation. In Maxwell's (1979) opinion China's road to development "has followed a zigzag course", thus reflecting the policies pursued by different groups of ideologists in charge. The "First Revolution" was lead by Chairman Mao in 1949 and the "Second Revolution" has been led by Deng Xiaoping since 1979 (Mazwell 1984). Table 7.1 outlines the chronology of major events which have shaped the recent history of China.

Despite the different changes in political climate, the development policy in China is broadly tackled on two fronts; rural development and urban development. In the early 1950s the role of cities was being attacked, their being labelled as consumer cities and not production centres contributing to the overall well-being of the nation. One striking feature of the Chinese development has been that of curtailing the urbanisation process (Kirkby, 1982). Prior to 1976, development policy did not favour the further development of existing cities (Kwok Yin-Wang 1987, p383). The initial dislike and distrust of cities was connected to the dominant role of foreign control and influence in the cities prior to the 1949 revolution. The early 1950s view of cities was that;

Table 7.1 The chronology of events affecting recent Chinese history

1949	The First Chinese Revolution led by Chairman Mao
1950-7	Soviet Style Economic Planning
1956	The "Hundred Flowers" policy of cultural and academic liberalisation.
1958-60	The Great Leap Forward
1961-5	New Economic Policy
1966	The start of the "Great Cultural Revolution"
1967	China joins the "nuclear club", successful test of China's first "hydrogen bomb"
1970	China becomes the fifth country to launch its own satellite
1976	Death of Chairman Mao and end of the Cultural Revolution. Hua Guofeng becomes the new leader.
1976	The Identification and demise of the "Gang of Four"
1976-79	Political uncertainty
1978	The Third Plenary Session of the 11th Central Committee, the start of reform programmes. The fall of Hua Guofeng.
1979	The start of the Second Revolution or Reforms, Deng Xiaoping becomes the new leader.
1979	The flourishing of the Democracy Movement and Wei Jingsheng's idea of democracy as the "fifth modernisation"
1981	Campaign against "bourgeois liberalism"
1983	Debates about 'socialist humanism' and 'alienation under socialism'. The Four Modernisation programme.
1987	16th January Hu Yaobang resigns and admits making mistakes on 'major issues of Party Principle'. Zhao Ziyang becomes the new leader.
1989	Spring, Students call for democracy, mass movements and the fall of Zhao Ziyang. June 1989 P.L.A ends demonstration at Tian'anmen Square

Source: Compiled by author. Also J.P Cole (1985 & 1987), N. Maxwell (1979), China Now.

> "cities should become spartan and productive places with full employment, secure jobs with a range of fringe benefits, minimal income and life style differences, an end to conspicuous consumption and lavish spending, and decent consumption standards for all". (Parish, 1984, pp15-16)

The 1950s saw the organisation of China's cities which has continued to shape the nature of urban life to the present day. With the outbreak of the Korean War, for strategic reasons a policy of the shift of an over concentration of industry from coastal cities to the interior was in practice. As the result of this policy, the big cities and treaty ports in effect subsidized the investment in interior cities such as Xian and Zhengzhou (Lardy, 1978). Throughout control of city cize has been the major preoccupation of Chinese planners. A number of tough policies were introduced to cut back the flow of migrants from the rural areas to the urban centres and indeed to reverse this flow. One of these policies was enforced during the Cultural Revolution which was in effect the forced movement of the youth to the countryside, involving up to 17 million youth assisting the development of the rural areas (Minjione 1987). Development strategies prior to 1976 were essentially designed for rural urbanisation and small city development. As an alternative to the expansion of urban areas, the rural commune was introduced in 1958 (Galtung, 1987). However, during the first session of the Fifth National People's Congress in 1978 there was a measure of commitment to the development of urban housing and infrastructure whilst at the same time the urban distribution policy statement declared that:

> " there was a need to control the size of large cities, develop medium cities in a rational manner, and rigorously develop small cities" (cited in Kwok Yin-Wang, 1987).

The rural development policies have centred on four principles which inlude;

1949-52	land reform
1955-59	collectivisation-communisation
1960-75	capital formation for agriculture
1953-75	the alteration of terms of trade between agriculture and industry in favour of agriculture and peasants.

The commitment to agricultural production was viewed as a precondition for China's industrialisation. In the 1980s also agriculture is seen as a component of China's modernisation strategy (Hagemann & Pestel, 1987). The process of land reform had in fact started during the liberation war in areas which were liberated by the People's Liberation Army. The 1950 Agrarian Reform Law was the basis for the elimination of the feudal landlord system in the countryside and the improvement of the lives of the poor peasantry (Maxwell, 1979, pp9-10). The land reform programme had an important impact on the improvement of the living conditions of the rural population and also reinforced their continued support for the revolution. As Hinton notes;

> "The Chinese land reform did not give land to the poor peasants. It encouraged them to organise themselves and take it, and in the process to crush their oppressors. This was the prerequisite for later socialist development in the countryside, for, without it, the old class structures and wealth ownership patterns would have been regenerated by the persistence of old attitudes and of institutions favourable to the rich" (Hinton, 1966).

The transformation of small private holdings into large-scale communes occurred immediately after the land reform implementation. The communisation process during the Great Leap Forward did not take long to materialise and culminated in the industrialisation of the rural areas through the building of steel and iron industries and a consistent health and education programme to raise the cultural level of the peasants (Gurley 1978, p13). The rural development policy which was pursued during 1960-1975, was the result of the change of economic course chosen by the Chinese leadership due to the rapid decline of the national output by around 20-25% which occurred between 1959 and 1961, concentrating firstly on agriculture, secondly on light industry and last on heavy industry (Gurley, 1978, pp13-14). The industrialisation of the rural areas by the establishment of thousands of small industries under localised authorities was promoted in order that these industries could produce and repair their own farm implements and machinery, produce fertilizers, insecticides, consumer goods and building materials, and develop power sources. This was to be the basis of self-reliance that the government tried to achieve (Glaeser & Steidl-Meier, 1987).

The Chinese authorities are at pains to emphasise that since 1979 great changes have taken place in the countryside. They point out to the rapid improvement of the living standards of the peasant population in the past 10 years (Bian Fa, 1988). One important change which has been introduced is the implementation of the contract responsibility system, linking pay with output and based mostly on households as basic economic units. Another change which is taking place is new land experiment that in selected parts of the countryside plots of land originally earmarked for grain production, but either underused or misused, could be amalgamated into large plots by village authorities. These larger plots will be leased out to farmers who are prepared to sign new grain contracts with the village (The Economist, 1987). In 1987 the Chinese authorities announced that for the first time their rural factories accounted for more output than China's farms (The Economist 1988). This clearly clarifies the benefits of the small scale industries which have mushroomed all over China since 1949 but especially in the past 10 years. How these policies are implemented through the centralised planning system is explained in the next section.

7:4.1 The Centralised Planning System

Chinese development and modernisation policies and practices since 1949 have followed several different models. In general, these have reflected changing official policies and events and varying approaches of the Chinese leadership to the challenge of economic growth and development (Ding 1980). Following the success of the revolution in 1949, several options for development were available to China's leaders. These options were based on the assumption that China, like all low-income countries, aspired to industrial growth and economic modernisation (Wu, 1979 & 1987). This is particularly true in the case of China, as her leaders have consistently and frequently stated that China seeks to be a powerful socialist state able to defend itself and be recognised as one of the major world powers.

Another basic goal of economic development in China has been to reduce the gap between the various levels of income and employed groups throughout the country (Chen, 1978). The three broad models of economic development and control available for

the Chinese leaders to follow in mobilising and allocating resources were:

> (1) free market economy in which resource allocation is determined by consumer preferences, which also determine and reflect the adjustment of prices;
>
> (2) market socialism in which the state owns and controls the means of production and provides central economic planning, but a pricing system is allowed to control the allocation of resources;
>
> (3) command economy in which the allocation of goods, services, and factors of production are determined by central planners and an administrative bureaucratic mechanism rather than a pricing mechanism. (Cited in Chen 1978)

It has been a mixture of all three models of economic growth that has been used in China in the past decades. It is necessary to point out the gradual departure from these policies which has started due to the recent political developments in China. However, at the same time it will be a long time before these policies can be totally abandoned. To achieve economic and industrial modernisation capital was necessary, and a strategy and plan were required to direct and control the mobilisation and allocation of resources.

China in 1949-1950 had some choice of strategy, but given that the basis of the revolution was Marxist and drew considerable aspiration from the Russian revolution, it initially followed the Soviet model of development with emphasis on centralised planning and the development of heavy industry and concentration of resources (Wu, 1987). It is important to point out that the leaders of the revolution in 1949 had extensive experience concerning the development and organisation of the rural areas, including land reform and agriculture. Despite the fact that they had to turn to the Soviet Union in order to gain knowledge for the running and administration of industry, they continued with their own ideas on the subject of rural development and reforms (Berger, 1979, p169). Planning policies in China have been based on the assumption that having a central and national plan is a prerequisite to effective organisation of the economy in order to serve all sectors of the working population; the peasant and the industrial work-

ers. In Mao's opinion overall planning meant "planning which took into consideration the interests of the 600 million people of China" (Mao Tse-tung 1957). The Chinese Central Planning is based on the principles of "Five Unifiers". These contain directions and means of effective co-ordination of activities in order to safeguard against too much emphasis on local issues which might endanger the interests of the region or the State, and also to ensure the all important support of the people for the implementation of the plan (Berger 1979, p181). The "Five Unifiers" are as follows;

I) Unified understanding, ie the ideological and general political understanding through continuous study which is universal,

II) Unified POLICY, the application of this general political line at each phase and to each specific problem,

III) Unified PLAN, co-ordination and reconciliation of the various interests in carrying through the policy,

IV) Unified DIRECTION, leadership for each economic and social unit coming from the next level above,

V) Unified ACTION, mobilisation of the working people at each level.

(For a more detailed account of these refer to Roland BERGER's article "Economic Planning in China" in China's Road to Development by Neville Maxwell 1979)

The aftermath of the cultural revolution, particularly since 1979 has seen an attempt to reduce the over-centralisation of planning in China. Different policies have been promoted under the titles of "guidance planning". In 1978 policy statements regarding the rural reform policy were broad and unspecific (Kwok Yin-Wang 1987, p387), and allowed for experimentation and interpretation. There were two pre-conditions, firstly, "the observation of economic law" and secondly "political stability", the former meaning development based on economic efficiency, and the latter an end to continuous revolution, advocated by the Cultural Revolution. According to Kwok:

> "the recommended mechanisms were economic management improvement and the adoption of more advanced technology. In administration and management, party and government were to be separated, government and enterprise were also to be separated in order to give enterprise greater flexibility". (1987, p388)

The new policies set out on the path of "reform, modernisation and the building of socialism with Chinese characteristics" (Bian Fa 1987). There are doubts, however, to this claim by many western analysts of Chinese reforms in recent years. They argue whether much of the economic system can be said to have changed when 90% of China's industry is still run by mandatory or "guidance plans". Amongst these Harding (1988) notes that guidance plans are "little more than mandatory plans with a 'please' in front of them". There have certainly been some dramatic changes and shifts of emphasis in both the rural and urban development initiated by Deng Xiaoping; as will be shown in the relevant sections of this chapter there is a far more concerted effort in aspects of technology transfer and modernisation. An example of this will be shown in the construction industry and the way in which the state-owned Chinese construction firms have managed to evolve and compete for international contracts with spectacular results. The following section will examine the process of planning in more detail.

7:4.2 The Planning Process

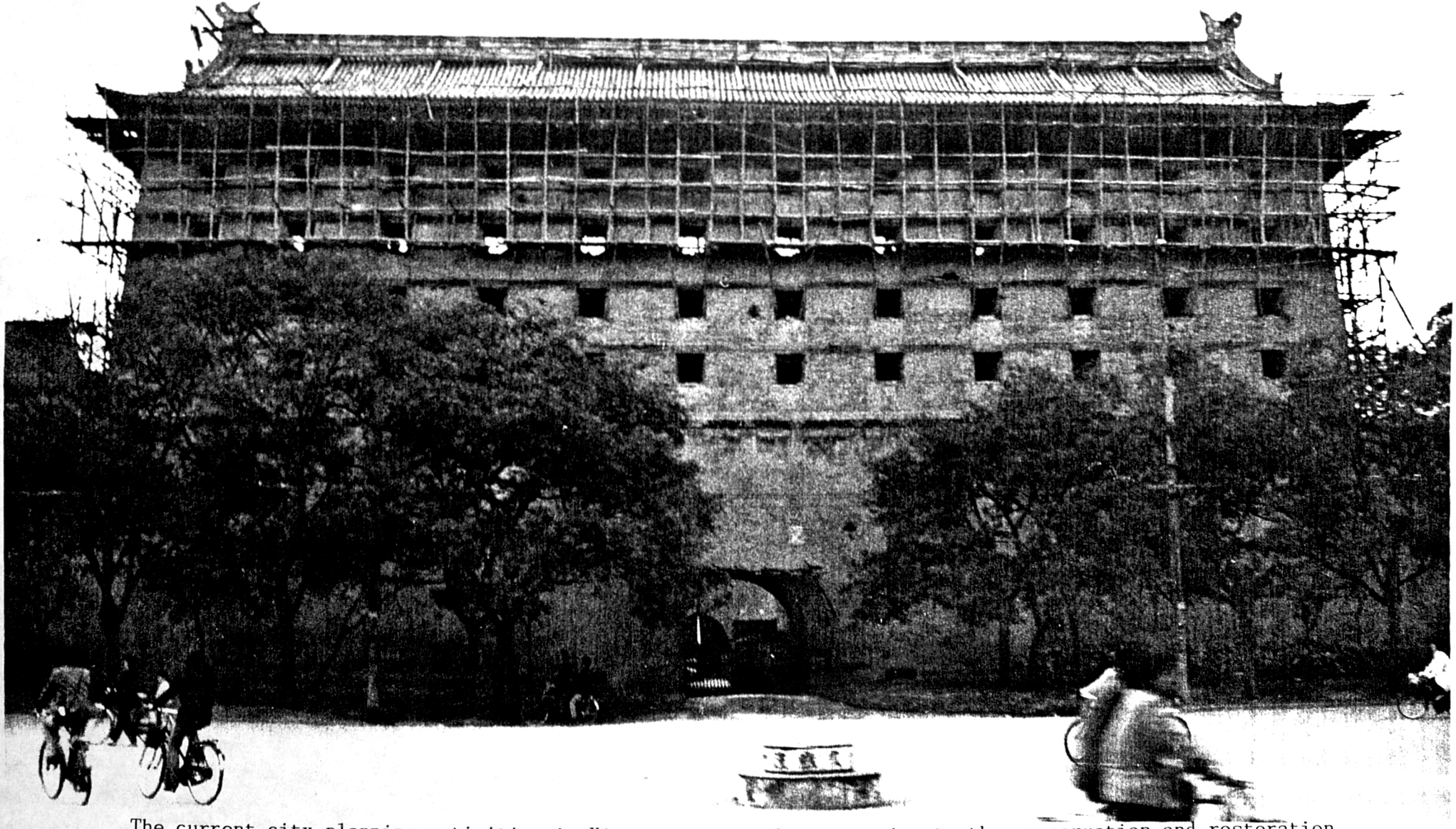
The planning process also initially followed the Soviet model with its focus on 5-year plans. However, events and mass movements such as the Great Leap Forward and later the Cultural Revolution interrupted the orderly progress of carefully drawn up 5 year plans. Following the political events of the 1960s and early 1970s, however, central planning on a 1, 5, and 10 year basis has been restored. Today China's national development and economic modernisation are based on such plans, and these plans are to provide the main outlines and framework for China's progress through the rest of the 20th century. Following the turmoil of the Cultural Revolution, there emerged in the late 1970s a period of comparative political stability in which leaders, such as Deng Xiaoping, became very influential (China Now, 1987).

Fig. 7.1



The Bell Tower in Xian used as offices for the Planning Department. The building is also a major tourist attraction. XIan planning law sets the height of the building as the maximum permissible height for new new developments. This law has been violated previously by a number of new hotel developments.

Fig. 7.2



The current city planning activities in Xian pay particular attention to the conservation and restoration of buildings of cultural and historic importance. One of the towers undergoing repair work was once in danger of being demolished.

The new policies placed a strong emphasis on practical economic goals and focused around the popular programme known as "The Four Modernisations"; the promotion of rapid modernisation in agriculture, industry, scientific knowledge and national defense. In recent years, China has been engaged in preparing annual plans to deal with the current realities of its economic production. These annual plans have been a practical supplement to the 5-year plans which were difficult to follow due to political instability and economic uncertainty.

Centralised planning in China is highly organised and carried out through a number of important bureau and offices. Modelled after similar Soviet organisations, the Chinese system has evolved its own structure and operational methods in response to China's particular economic and political condition. The State Council, a top level government agency staffed by important party functionaries, is responsible for determining economic goals and for laying down the main directions for all sectors of the economy. The State Planning Commission, however, actually does the work of preparing detailed plans. The commission is supported by a variety of other agencies, the most important being the State Statistical Bureau, an organisation responsible for providing specific quantative data necessary for careful and precise planning. Other important agencies that also contribute their support include the People's Bank, the State Capital Construction Commission (SCCC) (dealing with actual construction of economic projects and overseas investments in fixed assets), the State Agricultural Planning Commission, and the State Energy Commission (Pannel and Ma 1983).

7:4.3 City Planning and Urban Development

In the aftermath of the Revolution in China a major change of emphasis in the relationship between town and country occurred. The most important aspect of this change of policy was the deliberate attempts to promote of small and medium-sized towns as decentralised localities for industrial and small-scale production, for trade, administration and the provision of services. The urban areas account for approximately 16% (1985 estimates) of the total population of China, thus confirming a tremendous achievement in limiting urbanisation and the growth of cities (Habitat Forum 1987). The Chinese urban development

process which has been promoted over the past forty years is distinctly different from those of other developing countries where large cities are surrounded by slums and squatter housing (Mingione, 1987).

Concerning the rural reform policy advocated in 1978, there was also a change of attitude to the role of urban areas. This change of attitude culminated in the debate on whether urban development strategy should concentrate on small cities or large cities, which was resolved in 1980. The two major reform policies which put forward different approaches of urbanisation policy were the outcome of the Third Plenary Session of the 11th Party Central Committee in December 1978 and the Third Plenary Session of the Twelvth Party Central Committee in October 1984. The urban reform policy of 1984 applied a parallel set of changes to the urban context. First, this was i response to the urbanisation pressure built up by the rural reform policy. Second, it occured because urban enterprises had no autonomy and were tightly controlled by the state (Kwok 1987, p389). Discussions on the economic reasons for this change of approach and the resulting policies and their impacts are beyond the scope of this thesis; therefore only a brief reference has been made in this chapter.

Modern city planning started in 1949 and in the early years the government "transformed" a group of big cities, including Beijing, Xian, Lanzhou and Datong, to assist with the construction of key economic projects. The Cultural Revolution (1966-1976) slowed down city planning activities as the attention of the authorities was diverted to the rural areas. During this time investment in housing and urban development was greatly reduced as this was viewed as non-productive in the national interest. Since 1979, as already stated, the government has turned its attention to city planning. The process of the transformation of urban development in China can be classified thus as:

I. pre 1949 settlement form
II. the 1950s transformation
III. post 1970s transformation

The pre 1949 settlement structure of Chinese cities was that of a consumer town and the place of residence of the rural landlords, the civil servants and the ruling class. The towns therefore lived off the agricultural population. The transfor-

mation which took place in the 1950s in effect put an end to the landlords and was made possible by expanding the urban areas through the building of new factories and housing estates. The period of transformation since 1976 has been in the form of the decentralisation of small and medium-sized towns. In 1982 in further developments on an experimental basis, some large and medium sized cities were given the responsibility for supervising and co-ordinating all the enterprises in their areas. The result has been a breaking down of barriers between different sectors of the economy, and bringing into full play the cities' potential as organizers of production, construction and finance (Bian Fa 1987). The expansion of small-scale industry in the small to medium-sized towns took place largely outside state central planning. In some small towns 40% of those employed in industry are "peasant townsmen", who have their place of work in towns while their permanent homes remain in the villages (Habitat forum 1987).

The vast structural changes which most Chinese cities have undergone in the past ten years can be seen in the rapid construction of new administrative buildings and hotels. In conurbations such as Shanghai, Beijing and Guangzhou and other large cities, tower blocks oriented towards the international model have increasingly been developed, thus replacing the traditional Chinese single storey house with courtyard. The photographs in (Figures 7.3 and 7.4) illustrate this change.

Overall plans of cities in China are examined by authorities at different levels depending on the size of each city. Plans of municipalities fall under the direct control of the central Government (Beijing, Tianjin and Shanghai), provincial capitals and autonomous regions, and cities of more than one million population are examined by the State Council. Cities are divided into different categories according to their population, as follows;

I. Large cities with over half a million people,
II. Medium-sized cities with a population of between 200,000and 500,000,
III. Small cities with less than 200,000 people

In 1983 there were 289 cities with a combined population of 100 million. Together with the population of 75,000 towns the urban population of China was 200 million in 1983 (Weibang Chen, 1987). An important development in city planning occur-



Fig. 7.3
One of the many high rise residential developments and adjoining park and children's play area in Beijing.

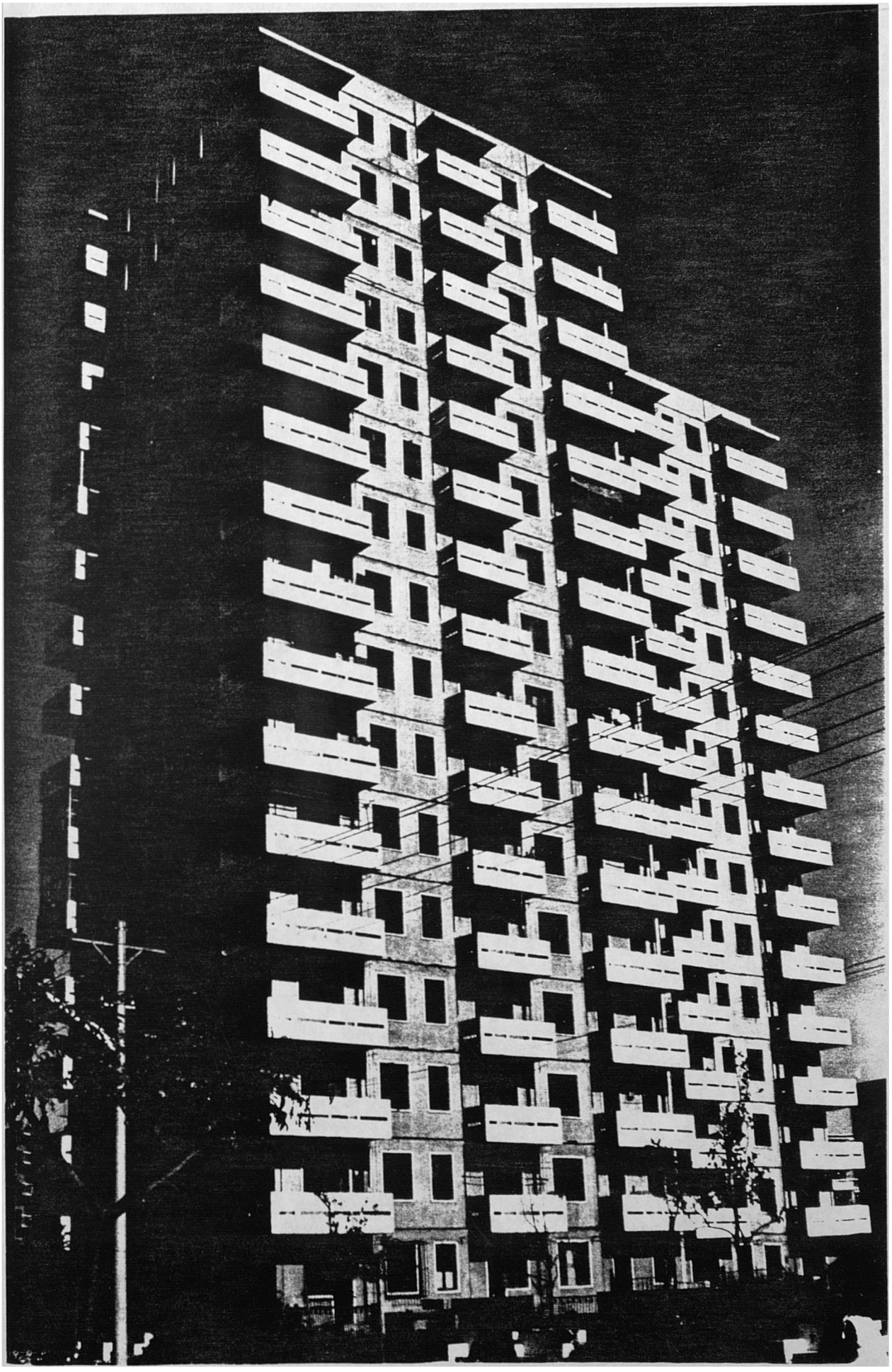


Fig. 7.3a
A recent example of high rise residential development in Beijing which has been favoured by Chinese designers in recent years.

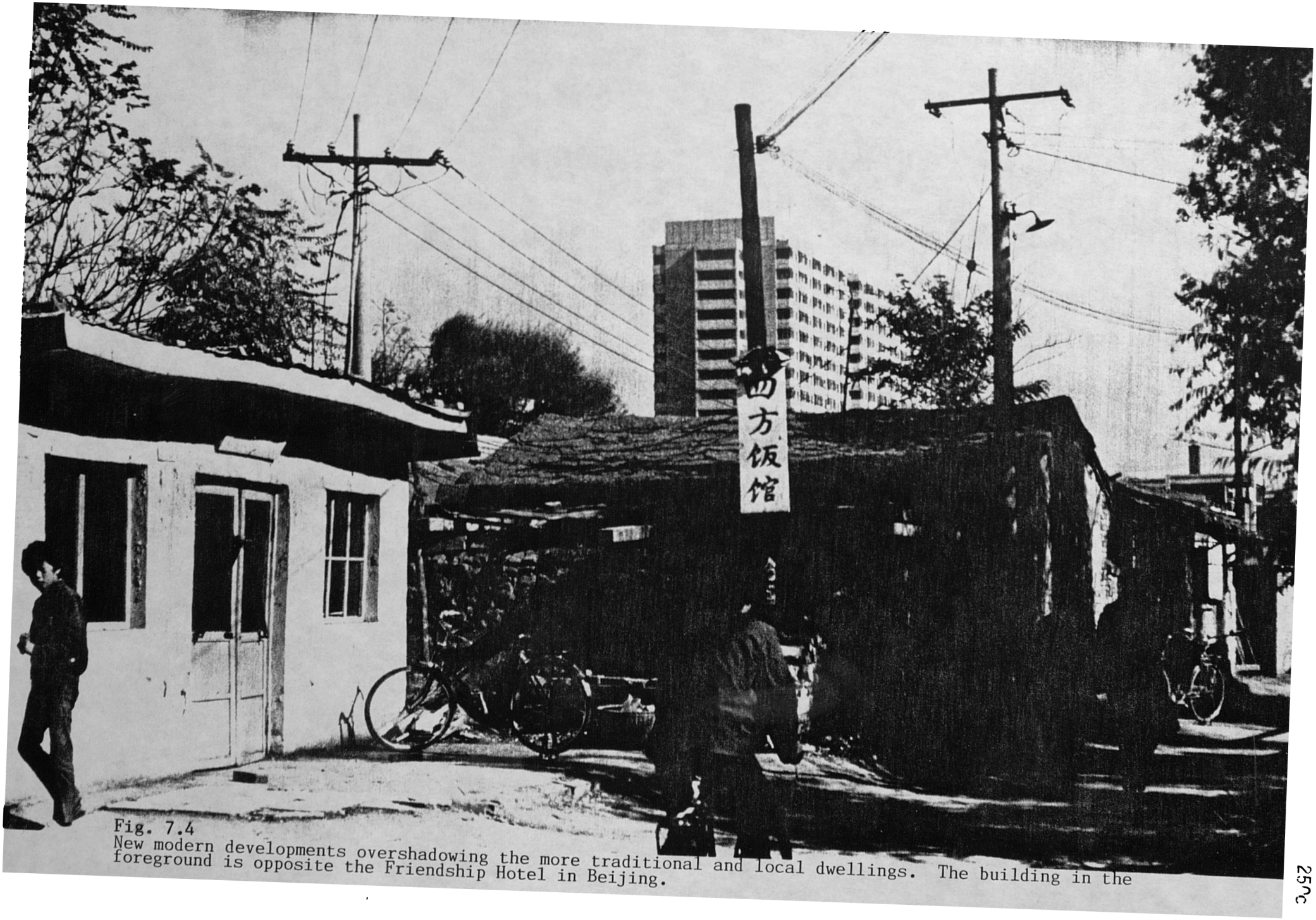


Fig. 7.4
New modern developments overshadowing the more traditional and local dwellings. The building in the foreground is opposite the Friendship Hotel in Beijing.



Fig. 7.4a
Another example of 1950-1960s housing developments in Beijing. Note the recent conversion of some of the balconies to additional living spaces.

red in 1984 which was the outlining of "guiding principles for city planning". These are four principles which are listed below;

1. Control the size of large cities, rationally develop medium-sized cities, and vigorously expand small cities;

2. Build cities according to overall planning and rational layout;

3. Attatch importance to the co-ordination of production with living facilities and to the construction of infra-structure; and

4. Protect scenery and environment, as well as historic and cultural heritage.

Out of China's 289 cities, by the end of 1983, 226 of them had completed their general plans, and 124 of these plans were approved by higher authorities (Weibang Chen 1987). The State Council had also approved the plans of 27 cities including; Langshan, Lanxhou, Hohhot, Changsha, Shenyang, Wuhan, Hefei, Nanning, Xining, Nanjing, Fushun, Beijing and others. The overall plan for future development of Beijing, however, was approved by both the Communist Party Central Committee and the State Council because of its importance as the National Capital. The plans for more than 100 cities have been approved by provincial and autonomus regional governments. In the counties there were also 800 county seat plans prepared. Since 1982 the Ministry of Urban and Rural Construction and Environmental Protection (MURCEP) has been responsible for planning. As has been stated in earlier sections, economic planning is quite separate from physical planning in China. According to Bor:

> "thus planning at present is predominantly physical/spatial and construction oriented, and planners think mainly in quantitative terms. the approach is single minded, deterministic and conservative with little, if any, consideration of alternatives or the need for flexibility." (Bor 1985)

Whilst agreeing with most of Walter Bor's remarks concerning planning in China, at the same time it must be said that since

Fig. 7.5



The historic centre of Nanjing has been carefully restored to its former glory. The complex of buildings former Confucian Temple serves as the major attraction for visitors and a centre of economic activity.

Fig. 7.6



The areas in the old Nanjing is a favourite area for shopping and entertainment by the local population.
Note the careful restoration work.

his visit to China and subsequent lecture to the British Royal Institute of Chartered Surveyors, there has been an awareness of a lack of flexibility in planning by Chinese planners. This is particularly the case in Xian where the Planning Department was visited by the author and a number of other architects and planners from Europe. In our lively discussion with Chinese colleagues we agreed on a number of points regarding the Master plan for the redevelopment of the areas around the Xian Central Railway Station. As for development control, our Chinese colleagues referred to a number of developments which have been built against the planning regulation, especially regarding the height of the buildings. They were unable to stop such developments previously because of political pressures from the provincial authorities. At present, however, there seems to be a conscious effort in pursuing and developing a sophisticated planning system which respects the cultural heritage so visible in most Chinese cities. As noted in previous chapters, the same process has occurred in Iran since 1979.

There were some disastrous planning mistakes in the 1960s development of big cities, including the demolition of the Wall around Beijing in order to open the way for the construction of a motorway system. This was at the time that, based on the Soviet approach to planning in the aftermath of the revolution, it was important to build monumental projects in the cities in order to show the people some result of the revolution (Kirkby 1988). However, in some smaller cities, because of the extent of the power of the local municipality and the Mayor, hurried programmes are implemented, with little concern for the local cultural heritage, under the slogan of modernisation. Such an example was witnessed by Cherrington (1987) in Zhenjiang. She explains:

> "It was a normal day in Zhenjiang City. The new Mayor not long returned from a stint in the USA, had promised on the previous National Day to do something about the unsatisfactory state of narrow and muddy roads. A programme of civic works was planned. The much vaunted promises of modernisation were being put into action as old and somewhat rusty bulldozers, with hundreds of workers in town, moved in to knock down one of the main streets in town". (Cherrington, 1987, pp26-27)

The open door policy which China adopted in 1979 has paved the

way for direct foreign investment with, in some cases, for government joint ventures in special designated areas known as "Special Economic Zones" (Bor, 1989). One of the largest and most successful of the SEZ examples is Shenzhen. The SEZs in China are quite similar to other Special Economic Districts (SED) in the world that are established for attracting foreign investment (Gar-On, 1985). The same idea is also being pursued in the coastal areas under the name of "Coastal Economic Zones", of which Nantong is an example (Zhou Yong-Yuan 1987).

7:4.4 City Planning Administration

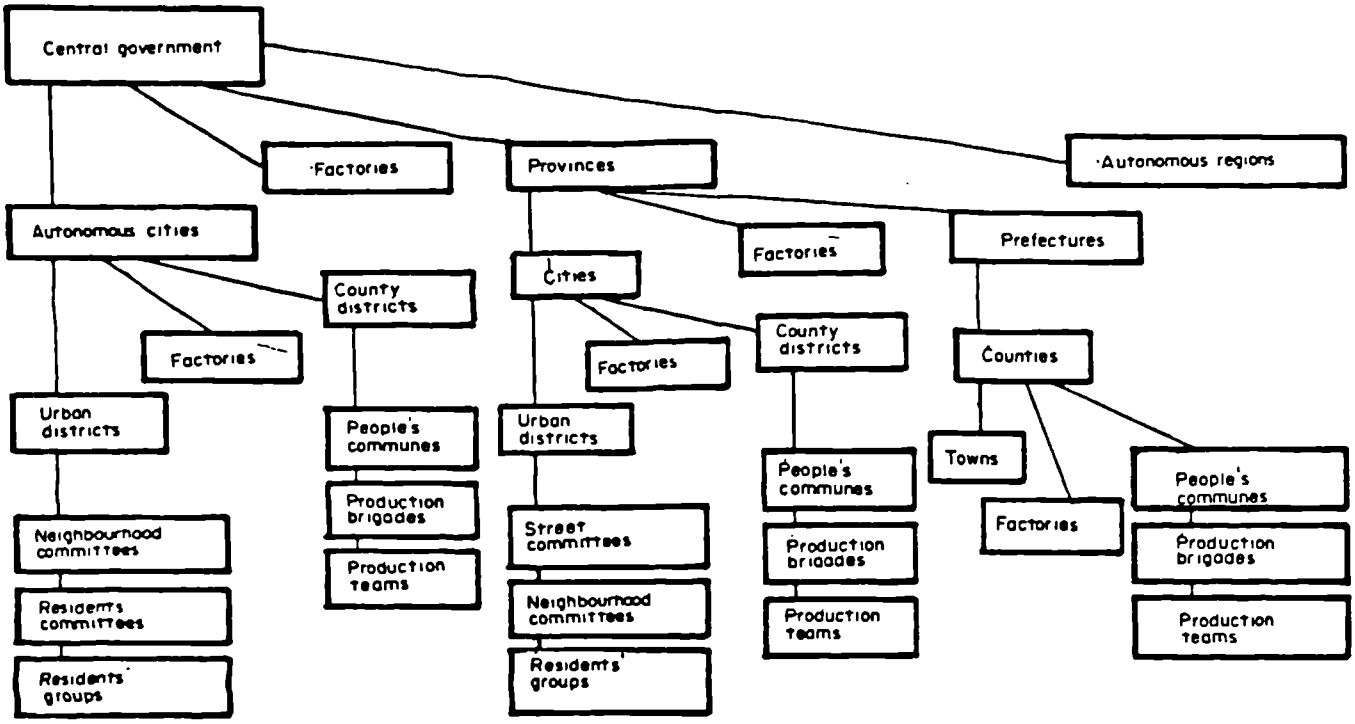
The functions relevant to urban development are carried out by three commissions of the State Council. These three commissions are; the Planning Commission, in charge of setting economic goals and resource allocation; the Economic Commission which co-ordinates different sectors of the economy; and the Capital Construction Commission, responsible for the co-ordination of physical planning, design and construction.

The City Government is responsible for urban policy and implementation at the municipal level. The physical development is carried out by the Municipal Construction Commission, which also acts as a link with construction commissions at higher level provincial governments (Bor, 1985). The overall activities of city planning, construction and administration are the responsibility of the Mayor in each city, and thus Mayors are quite powerful figures similar to American Mayors (Weibang Chen 1987).

For administration the cities are divided into districts of between 200,000-600,000 population. In turn each district is divided into neighbourhoods of 50-70,000 people (Diagram 7.1). The neighbourhood system is different from city to city; for example in Canton (Guangzhou), the city is divided into six urban districts of several hundred thousand people each. These districts are then sub-divided into units, usually wards or streets (Jiedao), which are responsible for the 2,000-10,000 families living there. Each ward is in turn sub-divided into 4-12 residents' committee units each responsible for the supervision of 100-800 families living in a smaller area within the ward. The residents' committee is also sub-divided into 5-20 residents' small group units, each of which looks

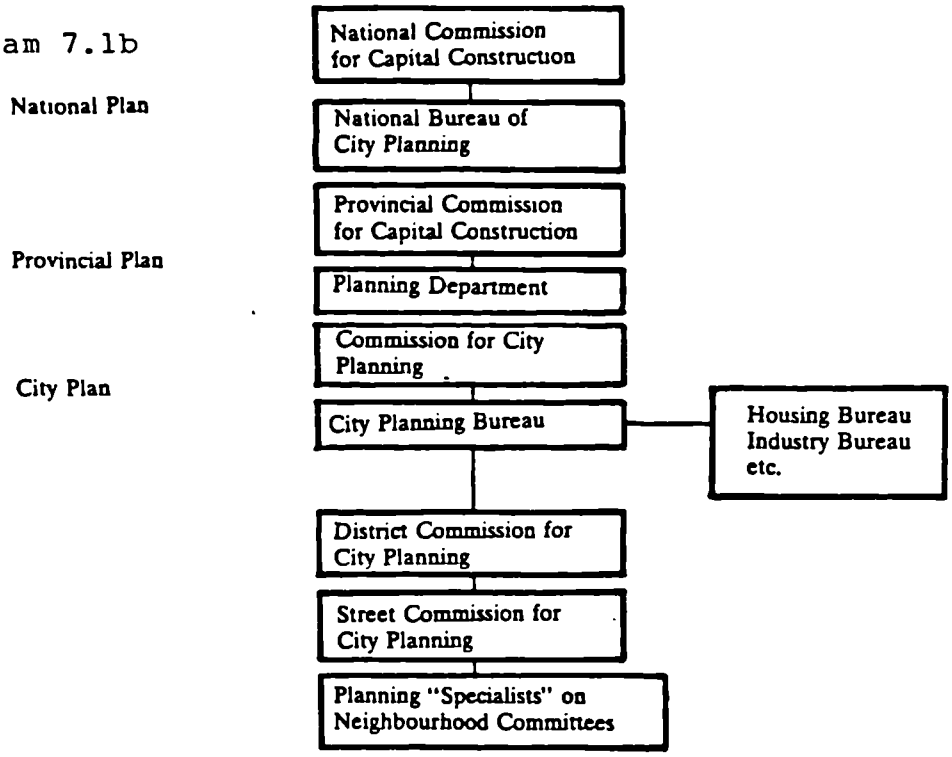
Diagram 7.1: (a), "top down" and diagram (b), "bottom up" flow of information and administrative hierarchty of Chinese Planning System.

Diagram 7.1a



Hierarchy of Chinese planning administration

Diagram 7.1b



Source: "City Planning in China" by Robin Thompson, in China's Road to Development, 2nd Edition by Nevillle Maxwell (edtr), 1979, Pergamon Press, p309.

after 15-40 families living in one or more buildings along a street or lane (Whyte & Parish, 1984 p22). Security, family counselling and planning, repair and maintenance, sanitation and street cleansing, the running of nursery and schools, care for the elderly, resolving family disputes, and programmes for the assistance for youth returning from the country, is all the responsibility of the Neighbourhood Committee. This system of administration is the most effective tool for bottom up planning and autonomy and participative planning which can provide information regarding the needs of the grass roots to the government (Bor, 1985). So far this chapter has provided a detailed account of the nature of planning, both economic and physical, in order to show how these plans are implemented; the following will provide an examination of the construction industry.

7:5 The Construction Industry

The examination of the nature of development planning and the process of planning revealed a surprising degree of autonomy and responsibility at local and neighbourhood levels. In this section the focus of attention will be on how the Chinese managed to use this mechanism of planning in the implementation of development projects both in the rural and urban areas. The post 1978 reforms in the form of renewed attention to urban development and capital construction in rural areas has placed an enormous burden on the construction industry, and therefore has required new methods of construction and implementation. Before embarking on a more detailed discussion on the construction industry it is vital, to consider the industry in a historical context since 1949.

As with other sectors of the economy, the construction industry has been influenced greatly by the political events which have taken place in China since 1949; even more so because through the construction industry it was possible to realize much of the large scale development projects in all corners of China. By the nature of the 1949 revolution it should be accepted that much of the growth in construction occurred in the state sector rather than the private sector. Indeed, according to Chao (1968), the construction industry was one of the few economic sectors of Communist China that underwent

nationalisation, or what the Chinese Communists call "socialist transformation", in the early years of the revolution. This transformation and the resulting impact can be best represented by a sequential chronology of events which shaped the construction industry since 1949 (Table 7.2).

According to Bhalla and Edmonds (1983);

> "the growth of the Chinese construction industry has been quite rapid throughout the post-revolution period".

As illustrated by Table 7.3, construction output rose from 1.2% in the pre-war period to 3.60% in 1957, and subsequently to around 4.23% in 1979. In terms of investment construction attracted the lowest rate compared with other sectors. As can be seen in Table 7.4, investment in construction was higher during the First Five Year Development Plan (1953-57), than during the period 1958-62, and 1966-1970. In the aftermath of the cultural revolution the rate of investment grew, especially in residential housing (Bhalla A.S & Edmonds G.A 1983, p203).

The impact of the above events on the construction industry has varied, either creating new methods of administration or implementation and technological emphasis. For example, during the cultural revolution, the construction teams which were set up and sent to the rural areas, though relying on labour intensive technology, at the same time provided a technically more advanced construction group for rural buildings. The industrialisation of building production in the 1950s, 1960s and 1970s was in order to save land whilst building high rise residential units at a faster speed. With the establishment of the Special Economic Zones, one of the principal objectives was to bring in foreign contractors in order to provide a basis for learning new physical planning approaches. An example of this was the commissioning of Llwelyn-Davies Planning for the Shenzhen Urban Design Study in 1987, which carried out the work jointly with the Shenzhen Urban Planning Bureau (Llwelyn Davies Planning 1987). The Chinese State Construction Companies also adopted the same strategy in obtaining modern construction management system through joint ventures with international construction firms. The 1979 policy of allowing the Chinese Construction Companies to compete for international contracts involved the establishment of China State Construction Corporation, the China Road and Building Engineering

Table.7.2 Total Trends of Production and Chronicle of the Construction Industry

1949	The Socialist Revolution, the start of rehabilitation and industrialisation programme. The creation of "Construction Units".
1951	The Creation of "State Construction Enterprises". The Chinese Roof Movement begins.
1952	Establishment of Construction Engineering Ministry
1953	Start of the First Five Year Plan (1953-57)
1955	The development of Prefabrication system based on the Russian Model, production of floor, wall and roof units. End of Chinese Roof Movement.
1956	The Establishment of City Construction Ministry
1957	The introduction of the "construction base system", ie the allocation of a minimum amount of labour and machines to each construction "base" or "district".
1957	Building Part-Prefabrication developed
1958	Start of Second Five-Year Plan (1958-62) The Great Leap Forward, and the first Large Scale Prefabrication
1963	Start of the Third Five-Year Plan (1963-67)
1966	The Cultural Revolution (1966-1976), Commune System, and emphasis on labour-intensive capital construction projects in rural areas
1968	Start of the Fourth Five-Year Plan (1968-72)
1975	Light Frame Prefabrication
1976	Start of the Fifth Five-year Plan (1976-80)
1978	The renewed attention to Urban Development
1979	The Four Modernisation Programme and the beginning of International Contracting by Chinese State Construction Companies
1980	The establishment of Special Economic Zones,
1981	Start of the Sixth Five-year Plan (1981-85)
1986	Start of the Seventh Five-year Plan (1986-90)

Source: Compiled by author. Also D. Forbes & N. Thrift 1987, China Now, 1987, Chao 1968.

Table 7.3 Growth of construction output between 1952 and 1979.

Year	Net Output	G.D.P	Proportion of construction industry (%)	Growth of construction output/annum (%)
1952	1.797	73.006	2.46	16.8 (1952-1957)
1957	3.899	108.147	3.60	5.4 (1957-1970)
1970	7.700	192.600	4.00	5.0 (1970-1977)
1977	10.845	261.101	4.15	13.2 (1977-1978)
1978	12.272	294.814	4.16	10.6 (1978-1979)
1979	13.568	320.421	4.23	7.8 (1952-1979)

Source: World Bank, cited in Bhalla and Edmonds (1983).

Table 7.4 Investment allocation in construction

Year	Construction (%)	Share of investment in housing
1953-1957	3.9	9.1
1958-1962	1.4	4.1
1962-1965	2.2	6.9
1966-1970	1.9	4.0
1971-1975	1.7	5.7
1976-1980	1.9	11.9
1981	2.2	--

Source: Statistical Yearbook of China, 1981, cited in Bhalla and Edmonds 1983.

Corporation and 60 more state construction enterprises in oder to acquire modern construction technology and management techniques (Guanting Cheng and Lusha, 1987).

Most of the work carried out on this subject has been done in the 1970s or early 1980s, and therefore appears to be slightly different from the present situation of the Chinese construction industry. For example, much of the focus has been on how primitive the nature of the industry has been and the lack of skilled personnel and modern technology and building materials which have caused bottlenecks . This can clearly be seen in the work of Kwok (1980). In his paper he sights construction constraints such as shortages of manpower from designers, managers, construction technicians to skilled and semi-skilled labourers as the norm. Furthermore he observes:

> "the relatively low level of technology is partially due to the lack of higher level technicians, and partly due to the lack of large-scale development. Construction technology is still primarily labour-intensive. The adoption of capital intensive methods is rare. In major cities, the limited use of building machinery is quite common in construction sites. There is less evidence of the large-scale application of modern building machines and plant. There is also no evidence that the construction machinery is produced on any significantly large scale". (Kwok 1980)

Whilst this argument is true in the rural areas, the situation has changed significantly in the urban areas. In an interesting study of the Chinese construction industry from 1949 to the mid 1960s, Kang Chao (1968) explains that a substantial proportion of the Chinese construction enterprises, especially those under the industrial ministries, are highly specialised and are devoted to specific types of construction and installation activities. Even in the rural areas during the Cultural Revolution, when particular emphasis was put on the development of varius projects related to the agriculture sector, the nature of the technology used for the construction of various irrigation systems or dams and bridges depended a great deal on the location of the project involved and was not necessarily confined to the use of primitive technology, as can be seen in the following photographs (Fig 7.7). Maxwell noted, in his visit to Shantung and Kwantung communes (Maxwell 1979, p77,182), that the construction of the aqueduct was very

Fig. 7.7
The use of refabricated panels and modern construction machinery for the construction of aqueduct in Shantung. Modern construction technology is used when accessible.

Source: Maxwell 1979.

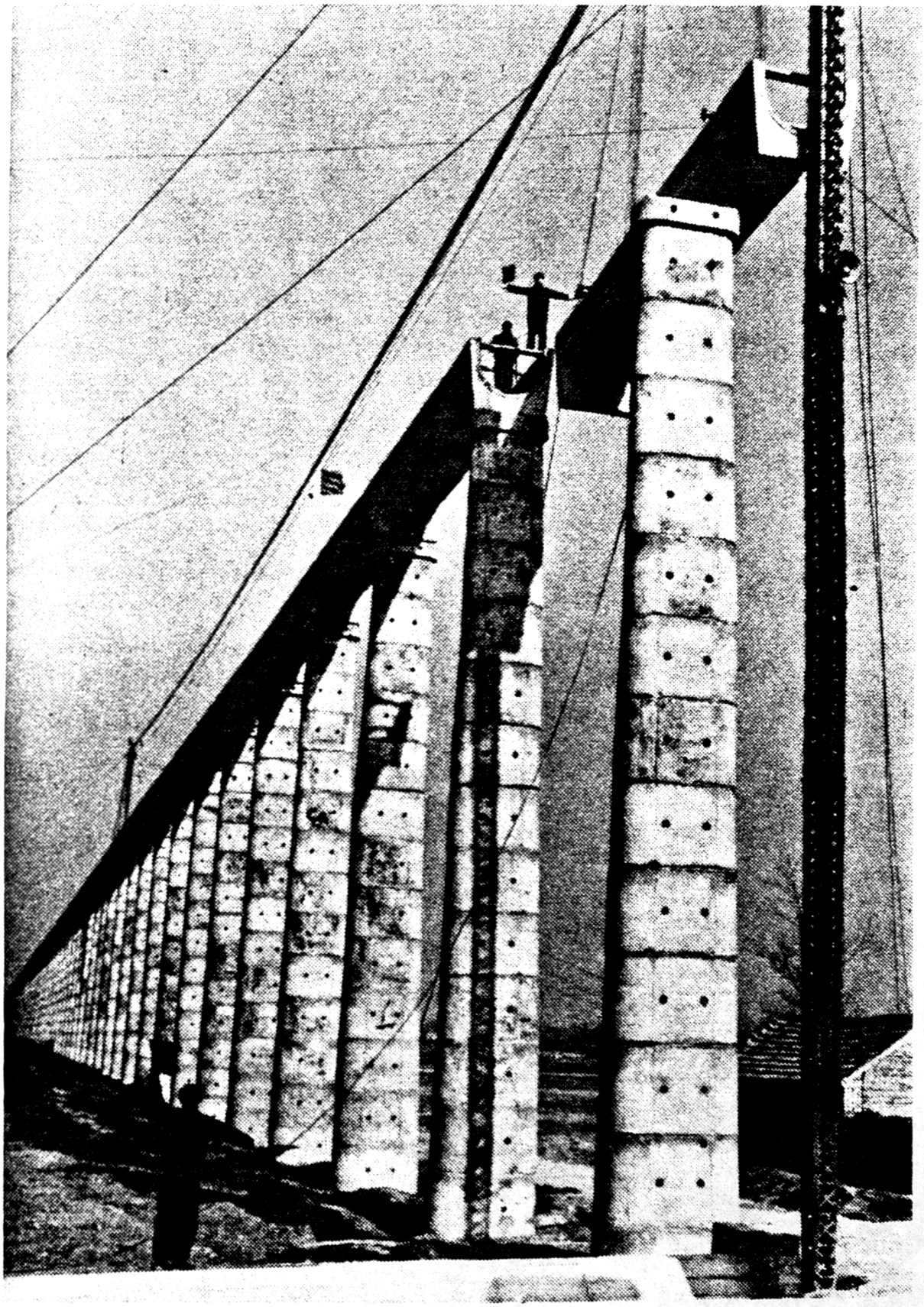
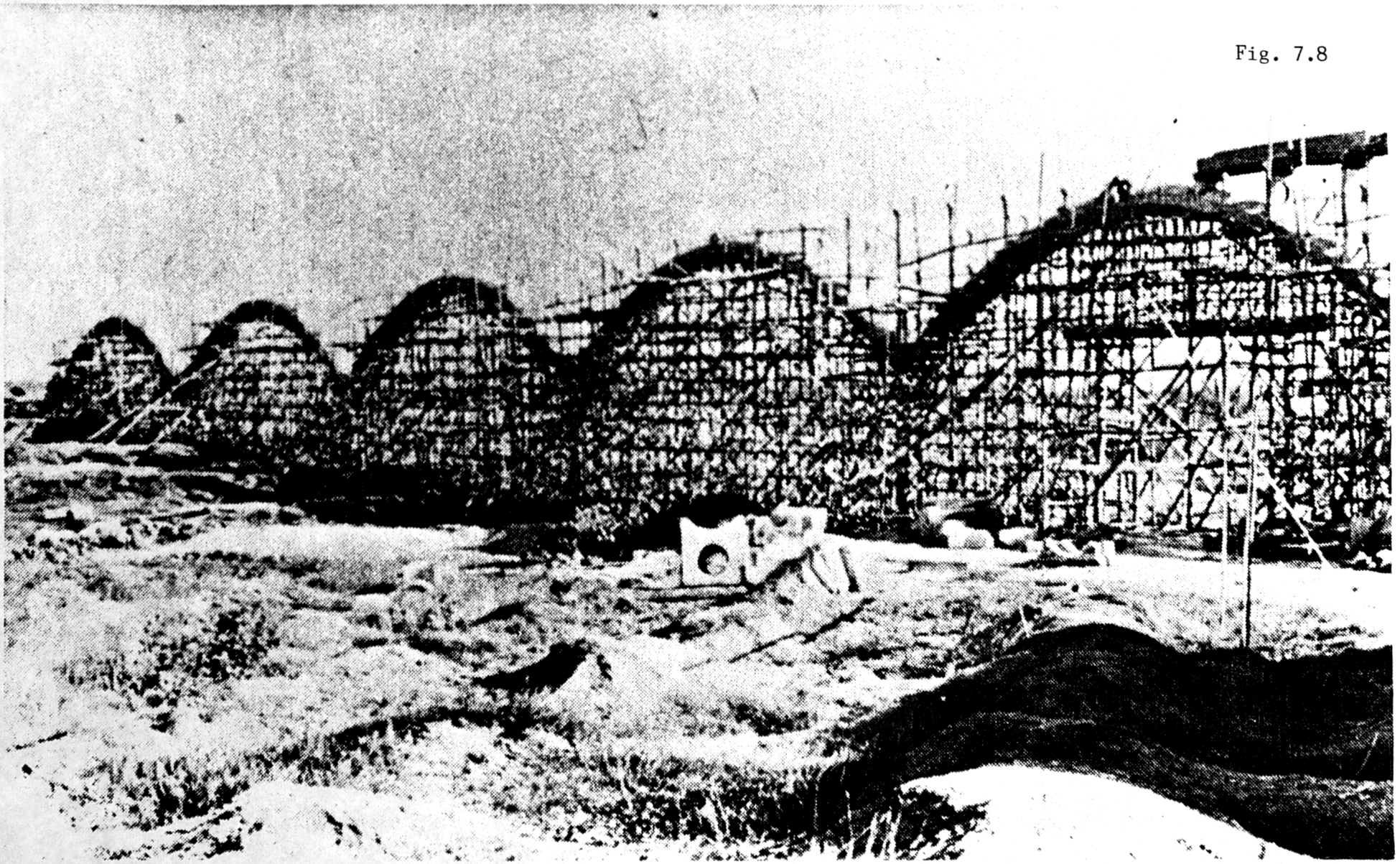


Fig. 7.8



In Kwantung extensive use was made of scaffolding due to lack of access to large cranes and prefabricated panels.

Source: Maxwell 1979.

different in the two communes. For example, in Shantung where they had access to cranes, the design of the aqueduct relied these cranes, meaning that it was made of pre-cast concrete sections, whereas in the other commune, Kwantung, where the aqueduct was built to irrigate a small area of former waste-land, they made extensive use of scaffolding (Fig 7.8).

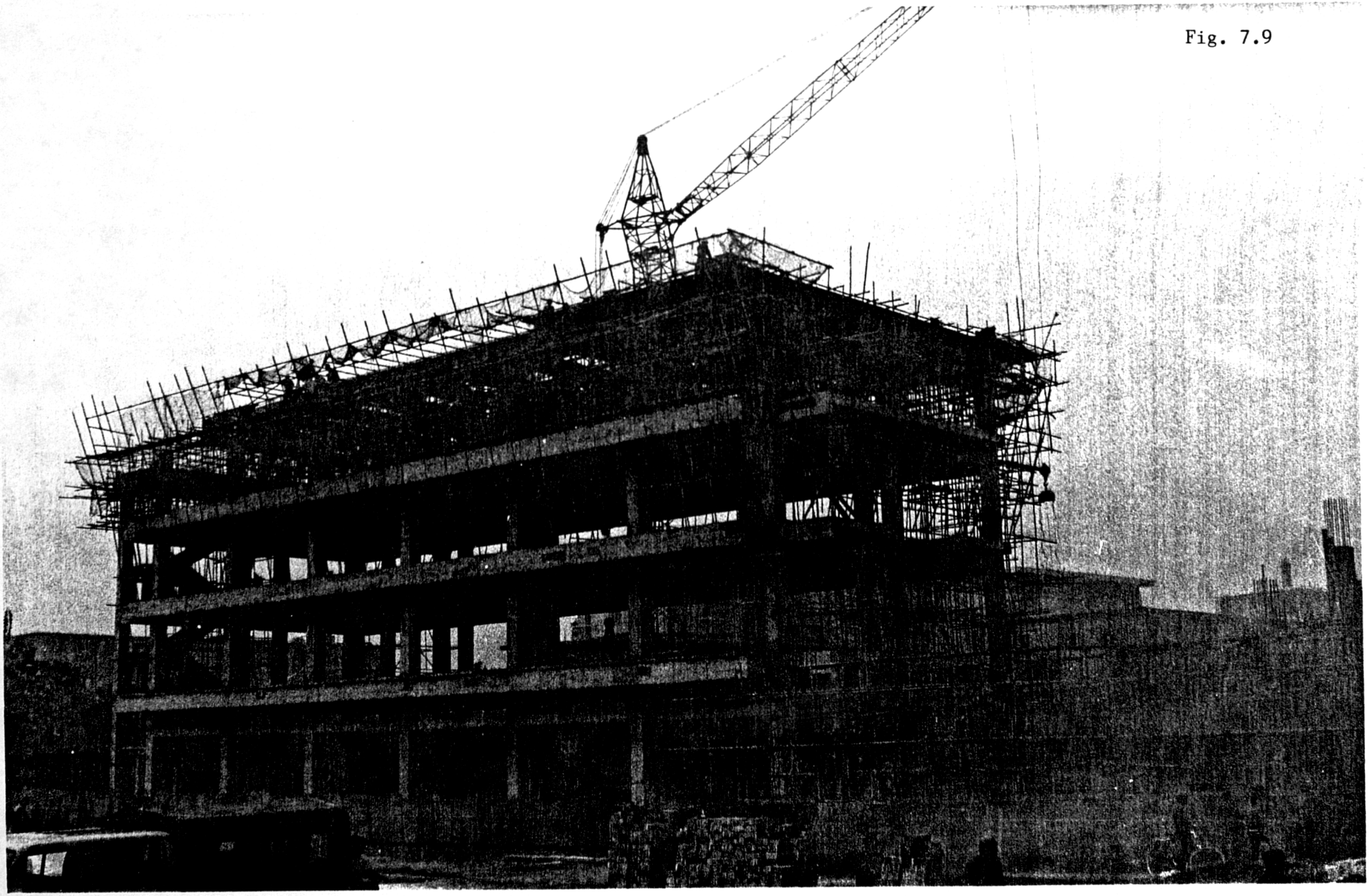
The situation in the use of technology in 1987 is quite different, whilst it cannot be denied that much of the technology is labour-intensive, in many large cities in China large scale residential and office development is taking place with the use of relatively modern methods of construction and building materials.

7:5.1 Urban and Rural Construction

In general there are differences between rural and urban construction, and many of the difficulties which are considered to be most important by planners are in the urban areas. Since the supply conditions for rural and urban construction differ substantially, the policies and management systems adopted are also significantly different. As a result, demand in the rural sector in the short term is not so immediate or apparent as that of the urban sector.

For ten years during the Cultural Revolution there was not much urban construction and, as the result of this, the physical condition deteriorated extensively. The lack of policy, management, organisation and building materials were the causes of such neglect. It is probably not realistic to say that there was no policy regarding the urban areas; at the time of the Cultural Revolution emphasis was put on the revitalisation of the rural areas as the majority of the population lived in the countryside. The same situation occurred in Cuba after the revolution and this was mainly to discourage urbanisation (Stretton, 1978) and encourage people in the urban areas to move out of the big cities, particularly Havana (Stretton 1978 pp 120-131). Compared with other countries the percentage of urbanpopulation of the country is low. However, 16% of the population would mean 150-200 million people in the urban areas in the mid 1980s. The necessity for rectifying the physical conditions of the cities and the concentration of large populations has made urgent the need for the construc-

Fig. 7.9



New development using modern construction technology and equipment in Xian.

Fig. 7.10



Numerous new developments including hotel and other public buildings with modern design and material change the urban architecture in many Chinese cities. The Chinese elements (windows) are incorporated as an immitation of traditional style. Such practices are not viewed positively by many Chinese architects.

tion of housing and infrastructure. The concentration of large populations in cities also constitutes an economy of scale which provides favourable conditions for supply. The density of the urban area has created technically more sophisticated methods of construction in recent years. In the following section the nature of construction in rural areas is examined.

7:5.2 Rural Construction

Rural construction during the Cultural Revolution involved different policies and conditions. The commune system, emphasising labour-intensive capital projects had set up construction teams for opening up marginal land for cultivation. These teams provided a technically more advanced construction group for rural buildings (Kwok 1980, p324). Generally, those peasants with traditional skills were also given private ownership of their housing as an alternative system of collective ownership. In the 1960s, decentralised settlements were planned and built according to the "Gan-de-lei principle" which involved decentralisation, strong neighbourhood ties, landscaping in villages, proximity of the workplace to housing, and agricultural developments as its main components (Brandt, 1987 p241).

An essential part of the programme was cooperation between future tenants of the new buildings and the builders. These professional builders helped the local population to learn different trades and how to organize their building activities, material and technology choice. The construction demand could be satisfied much more flexibly in terms of investment, management and construction, because all these decisions were controlled by smaller groups. This paved the way for the better use of resources available at local level as peasants had been known to be very adaptable in making use of local building materials (Fig 7.11). By and large, these policies remain largely unchanged, except for greater emphasis on collective construction rather than individual construction (China Reconstructs 1980). As a result, the development of rural physical conditions has been dependent on the local income and has adjusted quite well. Thus, construction demand in the rural areas in the short term is not particularly severe; however, the present economic policies, having given rise to the level of income in these areas will mean the diversion of funds to improving the conditions of houses, and



Fig. 7.11
The use of reinforced concrete frame and brick infill for construction in this village near Xian is necessary in order to withstand seismic activity.

future demand will be significant in long-term development. This has actually started to show to a great extent the rise in living standards. Owing to the post-1976 agricultural policy of making the family the basic accounting unit, many rural families have become extremely rich in a relatively short time and talk of 'millionaire households' is common. An obvious illustration of this is the frenzied building activity in the countryside, with a new type of building similar to the dwelling in Fig 7.12. Peasant families are building themselves new houses in a completely new style. Travelling through the Shanxi Province Becker (1988) visited a peasant household; he explains:

> "My host's new one-storey home had a courtyard, vegetable garden, separate kitchen, open air toilet, three bedrooms, and a vast living room with new furniture and a black-and-white television. The electricity was turned off two days a week and there was no telephone. Song Jia Xiao Zhua (Small Village of the Song Family), with its neat regular rows of houses, resembles one of those middle class suburbs with strict zoning regulations and rules about the height of your privet hedges."

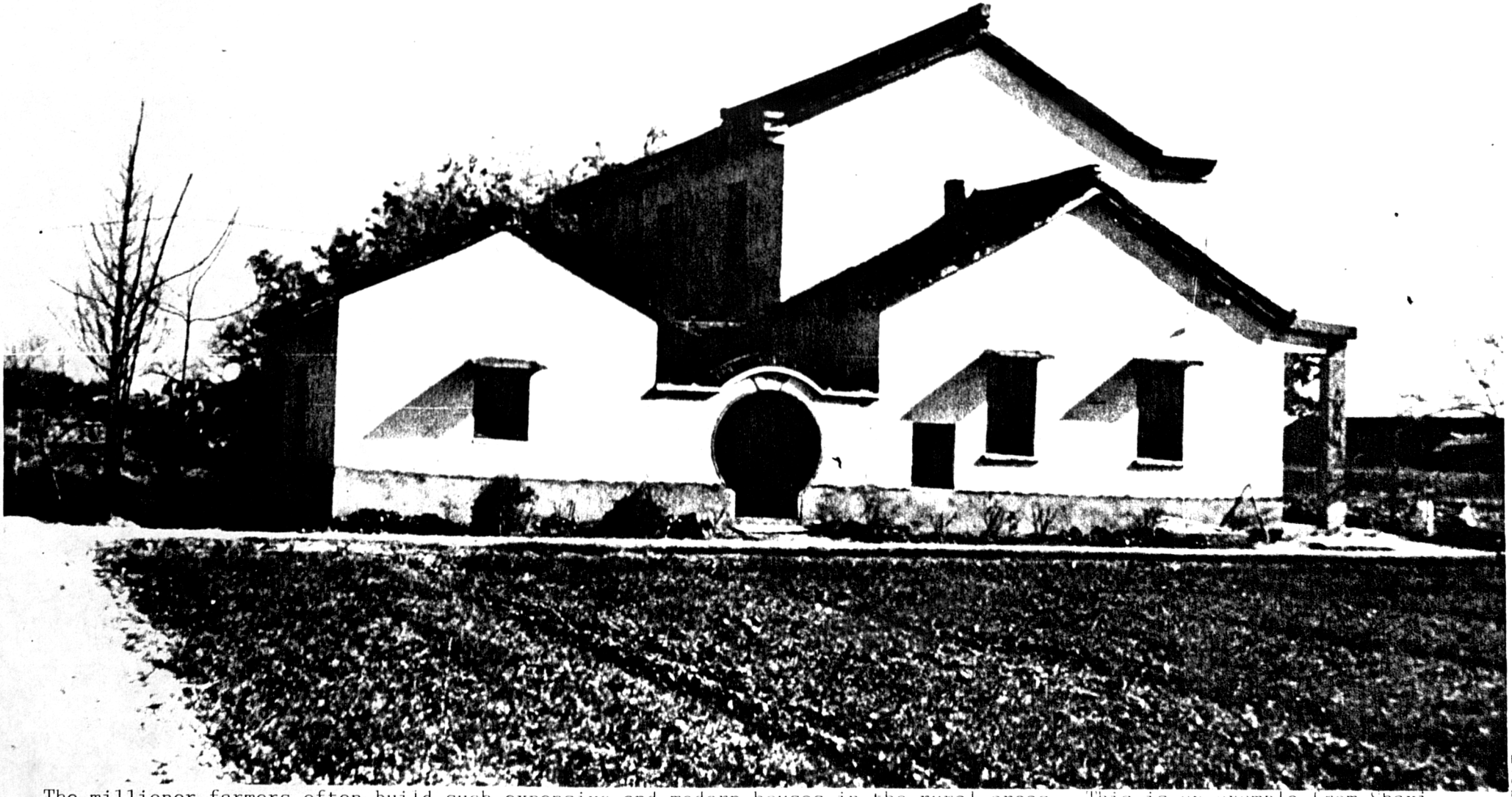
It is necessary to say that Shanxi Province is not one of the richest areas of China; this is the region where Cave Dwellings exist and where the per capita income is around 377 yuan ($100) a year. In another part of China the newly built houses in the countryside are known as 'foreign' houses (yang fang), (Wood, 1987). They bear no relation to local traditional styles, are invariably two or more storeys high, hung with balconies, supplied with running water and frequently decorated with brightly coloured glazed tiles. These houses are not built of concrete but are similar in construction and style, whether built on the outskirts of Peking or Canton (Fig 7.13).

The rural reforms of recent years have thus produced a high quality habitat. The process in which the rural inhabitants are assisted in building their new homes is as follows, considering the case of Gaosi and Jiajie villages in Danzhou which are best known for their farmers' new houses. When the residents wanted to start the construction of new houses they asked a city town planning agency to design houses for them. In the case of Gaosi, of the 391 households, 80 had built new houses by 1987. For the actual construction of the houses a unified housing plan and land allocation was chosen. Residents



Fig. 7.12
An example of recently constructed housing near Xian. Such houses are often of better quality of than urban housing.

Fig. 7.13



The millioner farmers often build such expensive and modern houses in the rural areas. This is an example from Shaxi.

who are able or want to build a new house first, should submit an application and yield their current location in order to receive a similar sized plot for their new house. The area of land which can be allocated for new house construction is deliberately limited in order to prevent encroachment into the valuable agricultural land; however, for families who have added new members this limit is extended accordingly but not more than 1.5 mu (0.1 ha) maximum. The cost of constructing a new house in Danzhou is approximately 15,000 yuan (Rinong 1987). The villagers can purchase bricks and tiles from their own construction material factories at a discount of up to 12,000 yuan (Beisi, 1989). Apart from subsidizing the villagers' construction of new houses, Gaosi village has dug 12 wells and built water towers for the community. This clearly illustrates how the Chinese have managed to organise their rural areas effectively in order to achieve a higher standard of living for their population with the use of appropriate implementation methods and resources. At the same time it should be noticed that whilst the economic strategy for the development of rural areas has changed to some extent, Chinese planners have not distanced themselves from the principles of co-operation and community programmes of the 1960s. The urban construction process, which has undergone some change in recent years, is examined in the next section.

7:5.3 Urban Construction

Except for joint enterprise construction and overseas Chinese financed housing, urban construction from planning, investment, management, construction to maintenance is totally the government's responsibility. There are four building criteria for urban development: intensifying land use; minimising construction costs; maximising existing resources; and increasing the speed of construction. As far as land use is concerned, planners have accepted that encroachment on agricultural land is undesirable and have stated that existing cities are not to expand (Betke & Kuchler, 1987). During the field trip it was noticed that there were large parcels of land available in the city centres, while Chinese planners and architects were arguing that there was a shortage of land. When it was pointed out that it is impossible to find such parcels of land in the major cities in the capitalist world due to the high cost of land, they were surprised. It was only early in 1988 that the

Chinese government announced that for all major new developments in urban centres the developers would have to bid for the land (The Independent 1988). In this connection in 1988 one of the large British estate agents was approached by the Chinese government to prepare a scheme for the commercialisation of land in some urban areas. Urban development will concentrate on developing the existing cities.

In 1978, Chairman Hua committed the nation to large scale urban development and this policy placed an immense financial burden on the state budget. Since a large quantity of urban construction is needed, construction financing became the most important constraint on development. However, in recent years the government has been encouraging the commercialisation of some newly built housing projects (Beisi, 1989).

One of these experimental housing projects was developed between 1985 and 1986 at Wu Xi city in Jiangsu Province. This project was not only new in its commercial aspect but it was also new because for the first time it has attempted to incorporate the traditional style of architecture and design with cultural consideration in a modern housing development (Bao Jia-Sheng 1987). This can clearly be seen in the photographs in the following pages.

As the responsibility for housing belongs to the employers, the types of urban constructions are socially oriented rather than production oriented. The city dwellers have less control over their housing, which is usually allocated by their work place and will consist of whatever type of building (traditional or modern) that is controlled by that institution (Wood 1987). Therefore, the preoccupation with factory construction in the Cultural Revolution has given way to a concentration on housing construction. Between 1966 and 1976, housing construction accounted for 4-7% of the total capital construction expenditure. Compared with the 1950s, when the annual housing expenditure had been 9.1% on average, housing construction during the Cultural Revolution was comparatively inadequate. From 1977 to 1979, the construction fund for housing increased from 6.9 to 10% (China Reconstructs 1980). In terms both of planning policies and investment, urban housing is expected to receive an increasing share of the allocation of funds.

Table 7.5 and Diagramss 7.2 and 7.3 illustrate the degree of increase in urban housing since 1979. Until recently the

Diagram 7.2 **Increased Investment in Urban Houses,** (billion)
Individual investment (million)

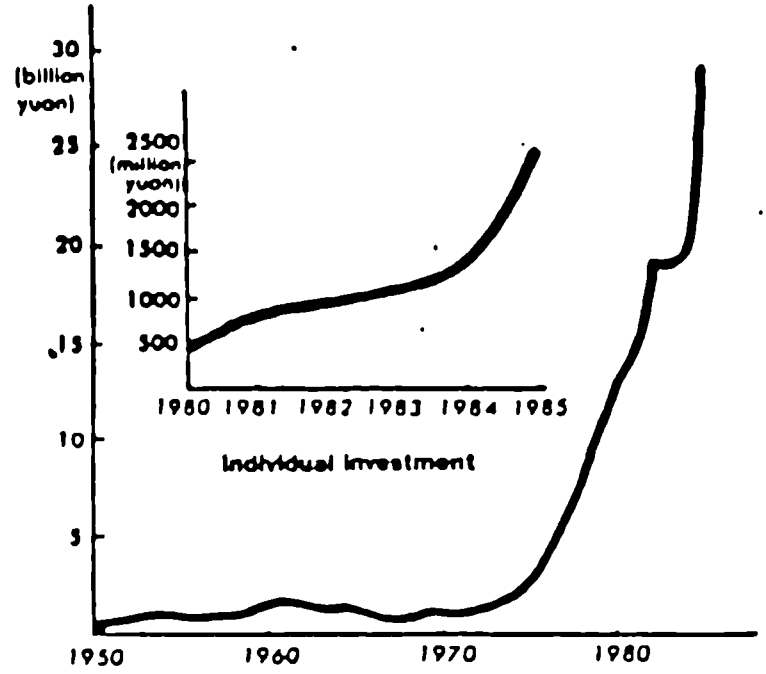
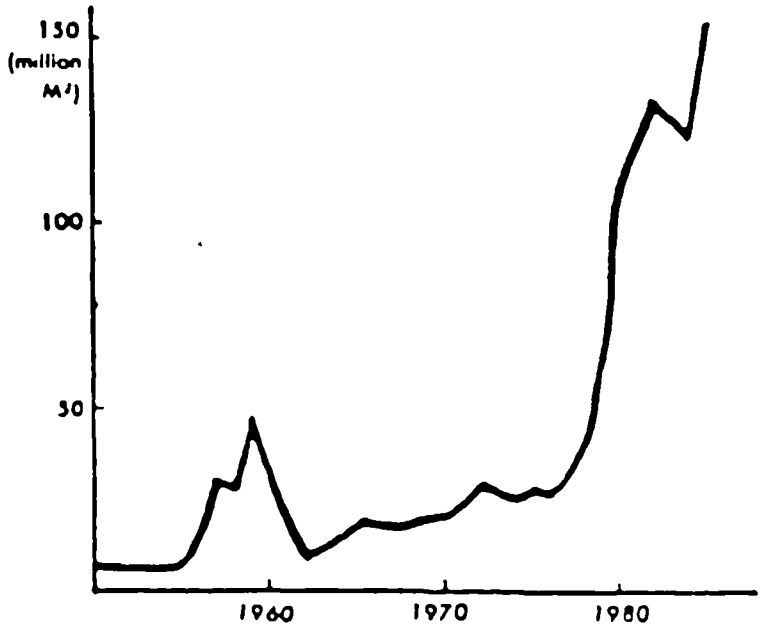


Diagram 7.3 **The Increase of Finished Urban Houses**
(million square metres)



Source: Zhu Yi, "Housing Prospects for the Year 2000. in Beijing Review, No.17, April 27, 1987, pp16-18.



Fig. 7.14
The new housing development in Wuxi by Prof. Bao Jiasheng is based on the SAR ideas. A new move towards adaptable housing in China.

Fig. 7.15



The new experimental housing in Wuxi overlooking another existing modern development. The new development revives the regional architectural style.

Fig. 7.16



The new development at Wuxi offers a more varied and pleasant environment, whilst making use of locally available materials which blend with the surrounding environment.



Fig. 7.17
The architect (Prof Bao Jiasheng) with the local councillors at Wuxi, 1987.

target of the housing programme has been that of quantity rather than quality achievement, but in order to raise the quality of urban housing planning and design and to accommodate the heavy demand during the Seventh Five Year Plan (1986-1990) and the following ten years, the Ministry of Urban and Rural Construction and Environmental Protection set itself during 1987 the 'goal' of "raising the function and quality of houses continuously and promoting coordination among the planning, design, construction and management sectors" (Wang 1987).

Table 7:5. The amount of urban housing (floor area) completed in different years in the different Development Programmes in the aftermath of the Chinese Revolution.

YEAR	The areas of completed bldgs (sqKm)		Portions %
	TOTAL	HOUSING	
1953-1957	143.78	64.29	44.7
1958-1962	176.78	53.29	30.3
1960	49.53	14.32	28.9
1963	10.87	3.97	36.5
1978-1980	211.19	118.73	56.2
1981-1985	608.47	371.96	61.1

Source: MURCEP, Ministry of Urban and Rural Construction and Environmental Protection.

It is estimated that an average of 130 million square metres of newly built residential development would be needed between 1986-1990, and subsequently 167 million square metres between 1991 and 2000, without consideration of the modernisation of the existing housing stock. It was during the Fifth Session of the Sixth National People's Congress that Song Ping State Councillor and Minister in Charge of State Planning Commission stated:

> "We must improve the living standards of both urban and rural residents on the basis of expanded production. In 1987 we must arrange to provide jobs in cities and towns.

> The total wages of workers and other employees will increase over the 1986 figure by 14 billion yuan, the bulk of which will necessarily go to the newly employed and to those who, after a trial period, become regular workers on a regular wage scale. We shall build houses for the workers and other employees according to the PLan, trying to complete 90 million square metres of new floor space."
>
> (Report on the development of the Draft 1987 Plan for National Economic and Social Development 11th April 1987 Song Ping)

This, seen from a Chinese Planner's view, can be interpreted in the manner of Table 7.6.

Table 7.6. Changeable pattern of the need for planning, design and management of the housing sector in China.

Item/year	1950-1978	1979-1990	1991-2000	2000-
Type of living	Survival	Warmly clothed & well fed	living well	cosy living
Demand for designing	Basic living	self sufficiency	com-fortable	living well
Demand for management	Common management	integral service & management	systematic optimal management	moderni-sation management

Source: After Wang Xiaoming 1987.

It is one thing to set development goals and targets but the achievements of such goals and the implementation of the programmes is another matter. The Chinese planners, whilst adhering to the principles which were developed during the early years of Socialist Planning, are at all times researching for new ways of modifying design and implementation procedures. For example, since 1980, (DHDCs) District Housing Development

Companies have been created in some residential districts of Beijing, mainly Dongguan district of Changping County, which operate on the basis of the so-called "six unified principles", meaning unified land purchase, unified planning, design, construction, allocation and management. The result of the experiment has been hailed as a great success. In the next section of the work the situation concerning construction resources will be examined.

7:6 Construction Resources

China is best known perhaps for the best methods of utilising resources in all aspects of life. This not only has major economic benefits but also promotes the enhancement of the environment. In the field of construction resources, although it is the general belief that labour is abundant, at the same time labour is used very efficiently. The construction industry has undergone a major transformation in all aspects of technology, materials production and utilisation of labour and up-dated management techniques. It is a common sight to find construction sites that have three shift working teams and schedules.

Great emphasis is placed on the recycling of materials, especially in the urban centres, whilst putting emphasis on producing good quality and diversed materials. For example, in Xinhui a multi-purpose hall was erected almost exclusively with recycled building materials (Habitat Forum 1987). However, the extent of new buildings especially for residential use and other capital construction, has caused major bottlenecks in construction materials and machinery. Various ways have been explored of creating an efficient building materials' industry and construction equipment production plants. Other methods of improving the shortages of construction materials include more emphasis on the standardisation of building elements and components, particularly in the form of industrialised production system (Guanqian Zhao 1987) and diversification and modification of design. In the medium and small cities, urban development has been financed, planned and carried out largely by local authorities. Construction technology and building types have been simpler than those needed in large cities due primarily to the relative availability of land in smaller cities. This has made the construction of low-

density and small-scale projects possible (Ma & Hanton 1981, p187). As these small industries continue to grow, they will provide many of the necessary materials for urban construction and increase the potential for urban development.

7:6.1 Construction Materials

In the Second Session of the First People's Congress in 1979, and the Third Session in 1980, the weak links of the construction materials' industry were noted as a sector that must receive priority and intensive development (Beijing Review 1979 and 1980). Construction materials are divided into three major categories. The first is of building materials, such as cement, glass, bricks, tiles, water-proofing and thermal insulation. In construction, these materials consist of over half of the construction costs. The second category includes non-ferric mining materials, i.e. stone, marble, clay etc. The third category is of specially-produced materials made from the two former categories such as fiber-glass, specially glazed tiles and panels, concrete lamp-posts, specially pre-cast units, etc. From the economic point of view, construction materials in these categories include many industrial and chemical products. Their development depends on the co-ordinated growth of these various industries. Because of the complex variety of construction materials, their supply cannot be guaranteed unless the related industries are developed. In national economic development, after fuel and transportation, a proficient construction materials' industry is considered as a necessary pre-condition.

During the Cultural Revolution, very few large scale cement factories, glass factories and glazed material factories were developed. Most of the cement factories were decentralised small scale enterprises distributed all over the country. Actually this is an advantage because most of the research done on this aspect now supports the idea of small scale materials' production units, as these will be relatively close to the designated market, thus reducing the cost of transportation, fuel and wastage. At the same time, this type of production unit is usually more efficient than a large scale factory. This is due to less wastage and non-dependence on long distance transportation (Brandt, 1987). In 1979 it was

estimated that the shortage of cement for urban housing construction was 30% less than its demand, and the supply of glass could only meet half of the necessary amount. Other basic materials such as brick, tiles, sand, stone and lime could not meet the demand.

It was reported in China Reconstructs in 1980 that many problems existed in the construction materials industry. Firstly, there was a lack of investment in construction materials prior to 1976 within national investment. Secondly, the scale of enterprises was too small and too dispersed geographically. As mentioned above, this has now proved to be more efficient than the concentration of a few large production plants. Of the 45,000 enterprises, over 40,000 were run by communes and brigades. Only 130 plants were of medium to large size. As a result industrial linkages were poor, management was inefficient, quality was low and prices were high. Thirdly, there was little innovation or development of new construction materials.

7:6.2 Manpower and Personnel

In 1980 construction technicians consisted of approximately 1% of the total labour force. Because of the lack of emphasis, training facilities and technical knowledge were limited, instruments and experiments were out of date. The training capability was therefore severely limited and student intake was low. In order to increase construction manpower, educational facilities must be developed to train personnel at all levels- design, management and construction technicians. This is how Kwok (1980) described the situation of manpower in the construction sector. Since 1980, however, many technicians and other trained personnel have been entering the construction sector acquiring their skills in special technical colleges. The present emphasis on modernisation in every field, standardisation of quality and diversification to suit local and functional needs, necessarily leads to the need for the close integration of research, design and construction branches, the main sections of the construction process.

It has been mentioned that the construction industry, by its nature, plays a significant role in the economy, especially through the creation of employment opportunities. The amount

of investment in the industry influences the nature and number of jobs which are created. Also most manual construction workers normally come from the countryside in most developing countries, particularly in China since the reform policies of 1978. In the past few years millions of peasants have left their villages in search of construction jobs in big cities. According to Bhalla and Edmonds (1983), the three main sources of construction employment comprise state enterprises, rural co-operatives and urban collectives/co-operatives. As illustrated in Table 7.7 the rate of employment, especially in the urban areas, grew rapidly in the early 1980s for the reasons mentioned above.

The construction boom which was in full swing until recently has slowed down somewhat and as the result of economic pressures many of the new construction projects have been cancelled. As The China Daily reported in 1988, over one million people have been sacked as the result of the cancellation of hundreds of urban construction projects and are being sent back to their villages. In fact the Director of the Department for Rural Economy, Mr Liu Yaochuan, has predicted that 13 million will lose their jobs because the government has "postponed" the construction of luxury hotels, restaurants and other "expensive projects" (The Guardian 1988).

7:7 Technology Adaptation

Because of the adaptation of labour-intensive methods, the average size of construction enterprises are large. As construction usually takes a relative long time to complete, works tend to be located close to the construction site so as to minimise transportation. The technological capability of different construction companies are not equal; therefore the enterprises which have higher technology construction companies can design and adopt more advanced construction. In general large cities tend to have technologically more advanced construction companies, while medium and small cities tend to have more traditional methods. In smaller cities always some construction machines are used on building sites. Cranes are used regularly, the most common being the small tower cranes and cranes on tracks. Concrete mixers of 400 litres volume (producing 0.4cum batches), together with vibrators are also used quite regularly (Fig 7.18 and 7.19).

Table 7.7 Growth of construction employment in China between 1953 and 1981

(000s)

ITEM	1953* No (000s)	1958* No (000s)	1980+ No (000s)	(%)	1981+ No (000s)	(%)
Total employment			104,441	100.0	109,327	100.0
of which: Construction	1,655	2,950	9,109	8.7	9,245	8.5
Total employment in state enterprises	--		80,193	100.0	83,722	100.0
of which: Construction in state enterprises	1,320	2,330	6,744	8.4	6,692	8.0
Total employment in urban collectives	—		24,248	100.0	25,675	100.0
of which: Employment in urban collectives	335	620	2,365	9.8	2,553	9.9

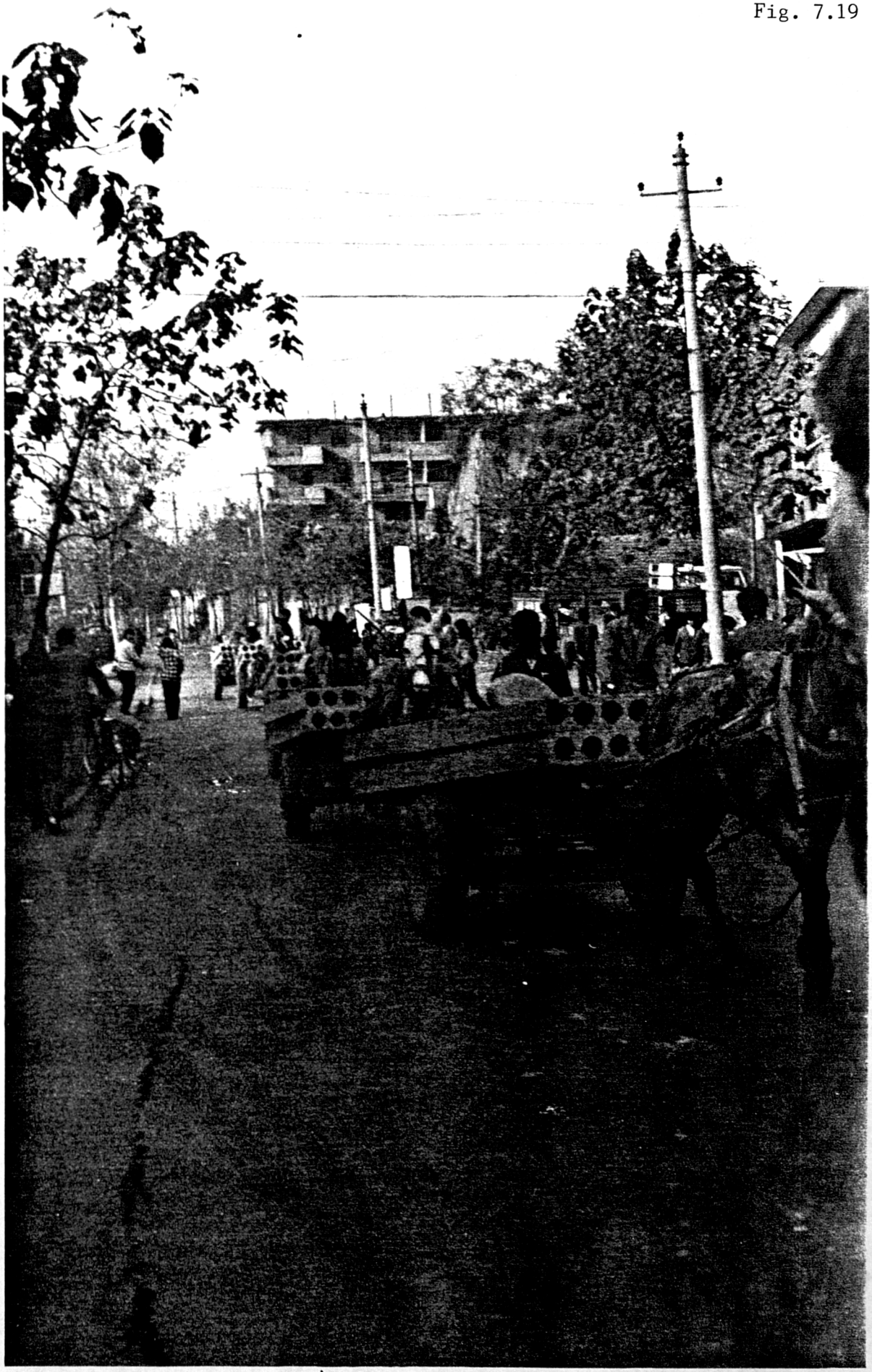
Source: * Kang Chao, Recent Development of the Construction Industry in China, Unpublished paper prepared for the ILO Technology and Employment Branch

+ Statistical Yearbook of China, 1981.



Fig. 7.18
This particular site is a new development in Xian where extensive use is made of cranes and other construction machinery.

Fig. 7.19



Modern and traditional technology coexist in many parts of China. In this case, precast concrete floor panels being transported by the horse drawn carts. Near Xian.

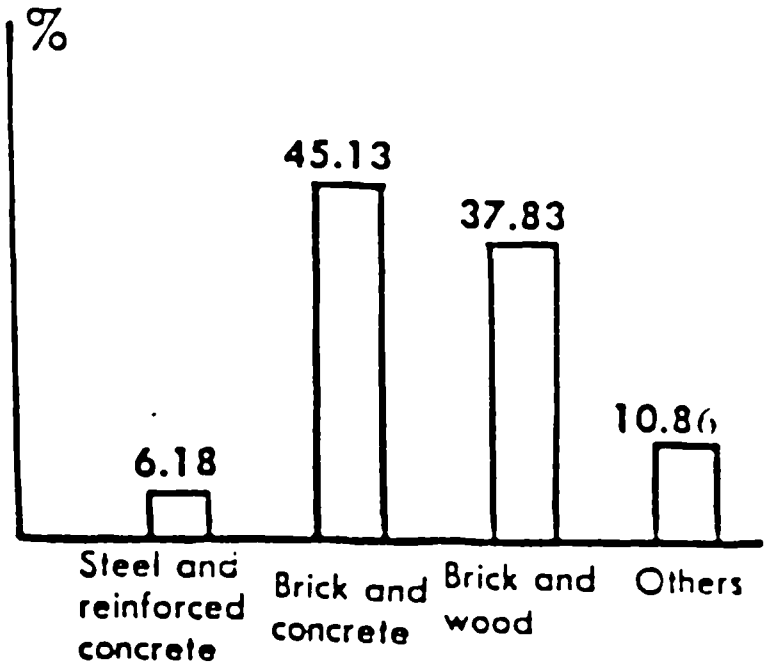
As mentioned in the earlier parts of this chapter, much of the development in China, at least in the 1950s, was influenced by the Soviet planning system and implementation methods. The same pattern occurred in the construction industry. During the "Soviet Model Phase" (1949-57), the Chinese deliberately emulated the Russians in mechanising the construction industry (Bhalla, 1974). However, after the breakdown of the Chino-Soviet relations, the Great Leap Forward phase (1958-60) was the beginning of a new technological epoch (ibid). In Bhalla's view;

> "the departure of the Soviet advisors provided a climate and opportunity for indigenous innovations in the direction of labour-intensive technical change. The growth of the capital-goods sector, which is the source of construction and other machinery, seems to be based on independent designs and on the adoption of the Soviet blueprints much more during this phase than during the previous phase" (Bhalla, 1974, pp68-69).

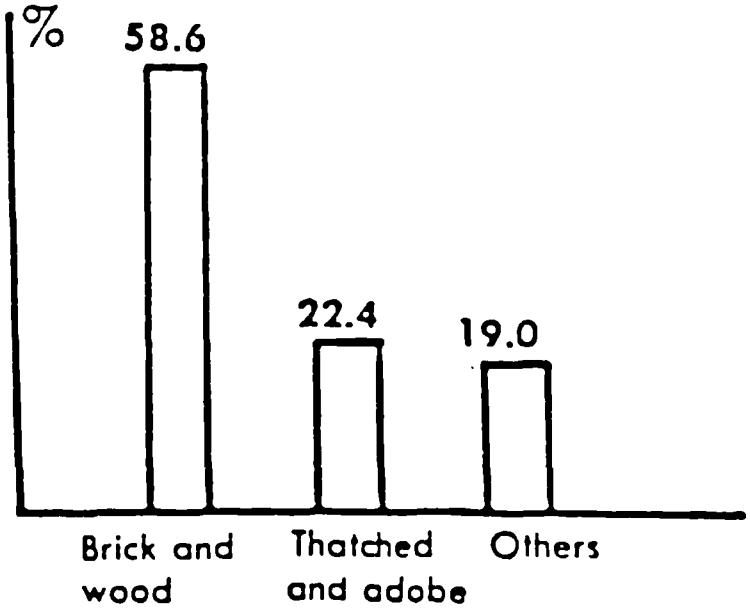
From 1956 and the beginning of 1957, the Chinese government reconsidered the policy of overall mechanisation in construction. From that time emphasis was placed on reducing reliance on capital intensity by means of full utilisation of existing capacity much more than on the increase in the amount of construction machinery. The introduction of a large number of small-scale projects, whilst generating demand for simpler tools and equipment, enhanced the efficient application of innovations. This was as part of the overall policy of "walking on two legs" (Brandt, 1987).

With regards to the more recent periods, the construction industry in Beijing, Shanghai and other large cities is clearly at an advanced stage compared with that of other smaller cities. This is particularly the case with large scale residential and hotel complexes, much of which uses the most modern construction techniques and materials with rather sophisticated design (illustrated by Diagram 7.4), against the structure of rural housing (shown in Diagram 7.5). During a number of visits to different construction sites in one of the districts of Beijing, a Dutch technology specialist mentioned that he was, "surprised by the degree of sophistication of the technology used on some of the residential development sites". The construction methods for all of the high rise apartment blocks varied from in situ concrete frame, partially precast

agram 7.4 The Structure of Urban Houses



agram 7.5 The Structure of Rural Houses



Source: Zhu Yi, "Housing Prospects for the Year 2000. in Beijing Review, No.17, April 27, 1987, pp16-18.

concrete structures and recentl steel structures (Fig 7.20 and 7.21).

Standardisation has helped the improvement of the construction process by reducing the shortage of design personnel as well as increasing the speed of construction by eliminating the design stage. The building industry in China developed a pre-fabrication system using the Soviet model for wall, roof and, in particular, floor units in 1955, and has remained unchanged until recently. Apart from producing reinforced concrete beams, plates, columns and pillars, other units such as aerated concrete components, sound insulating panels used in the interior as well as the exterior, are also made. In addition, windows, water, electrical and heating systems as well as toilet units were also being prefabricated. Other evidence of the industrialisation process include the production of a lighter building, with the aim of reducing structural requirements, which was initiated in 1975. The four systems of industrialisation in the construction industry can be grouped as follows:

I) Large-scale pre-fabrication started in 1958 and further developed in 1966, producing some 1m sq m of construction in major cities of Beijing, Nanjing, Kunming, Xian and Shenyang. All external and internal components, structural and non-structural units are pre-fabricated. All units are factory made and utilise large quantities of industrial waste.

II) Major component prefabrication; adopted in 1974. This type of industrialised method has been used for at least over 800,000 sq.m. of construction. The internal walls are cast insitu while the external walls can be cast insitu or are factory made.

III) Part prefabricated building method developed in 1957. It has produced well over 6 million sq.m. of construction before 1977. In 1977 alone 1.4 million sq.m. of construction was completed using this method of construction. It involves the making of building blocks, both solid and hollow. Utilising industrial wastes extensively as building material, the solid blocks are factory made while the medium and small hollow blocks can be produced by machines in factories or on site. Because of the flexibility of blocks in construction, they can be used for many diffe-

Fig. 7.20



The construction of new developments in and around Beijing employing the most modern construction technology.
The introduction of some of these modern techniques were as the result of joint ventures with international contractors.

Fig. 7.21



One of the numerous sites of new developments under construction in Beijing. Such construction sites are not any different from any construction site in the western world.

rent kinds of construction.

Apart from housing, it is being used for schools and social facilities as well as office buildings. Compared with the traditional methods, the construction time is reduced by 25%-30%, and the construction cost is reduced by about 10%. This type of pre-fabrication plays a major part in urban construction, particularly in secondary cities.

IV) Light frame prefabrication designed for column and beam structures and in action since 1975 in Beijing. Three of the construction components, i.e. columns, beams and panels, are factory cast while columns can be factory made or produced on site. Because of the column and beam structure, the weight is reduced in construction, whilst allowing more variation and flexibility in the design process (Kwok, 1980).

As the result of the recommendations of the National Housing Conference in March 1980, organised by the State City Planning Bureau, the management of urban housing relies on local government. Housing for large enterprises is to be organised, managed and financed by those units. For medium and small enterprises, the local housing management bureau will co-ordinate their needs, centrally plan, construct and manage housing for them. Groups and individuals who wish to construct private housing for their own use will be organised through their own work units. As the result of this some cities rearranged their urban housing organisation. For example, Guangzhou established a housing construction company for the city on the models of Shanghai and Haerbin. The basic principle of the company is to consider housing as a specialised profession and housing production as a commodity production. Planning, design and construction are all centralised in this company. It manages all the available investment from the state, province and city, as well as enterprises which cannot undertake housing construction themselves and privately funded housing.

There is one product which is made in different locations both in small scale and large scale production yards and is used widely in both the rural and urban areas in China. It is a form of pre-cast concrete floor slab which was developed in 1984 and can be produced with a simple production technique.

As for the rural areas, as mentioned previously, 85% of the Chinese population live in the rural areas. Previously, the policy on rural construction depended on individual or mainly collective efforts. Most of the construction was locally financed, planned, designed, constructed and managed. Techniques and materials used were largely traditional to begin with and later improved and it can be said that it was in this area that appropriate technology was initiated and used widely.

As the economic and living conditions have improved, the demand for rural construction has increased both in quantity as well as in quality. More advanced construction technology has been developed and adopted, so that it could respond to the needs of the rural population as outlined in the earlier part of this chapter. It is this change in housing and consumption which is casting doubt on the survival of the concept of technology (Hahn, 1987 and Beisi 1989). In the case of China it was shown that much of the success in the acceptability of the notion of A.T was due to the fact that it was a policy advocated and encouraged by the state in a socialist society.

7:8 Conclusion

In this chapter the concept of centralised planning and implementation has been explained as a comparative study in order to try and illustrate the way in which China has managed its development in the past four decades. It has been shown that in the aftermath of the end of the "Cultural Revolution" the authorities realised that in order for China to survive and develop there was a need for major revitalisation of development strategies. Under the goal of "four modernisations" there has been a dramatic transformation in all aspects of industry and life in both rural and urban areas.

One of the most important features of the reform policies has been that of the urban development policy. After decades of near neglect in the conditions of the urban areas mainly due to anti-urbanisation policies of the previous development plans, there has been an impressive surge in investment in urban development. The result has been a housing boom which has brought about calls for an improvement in housing conditions both in quantity and quality (Figs 7.22 and 7.23). More modern foreign technology has been introduced to many sectors of the industry, including the construction sector.

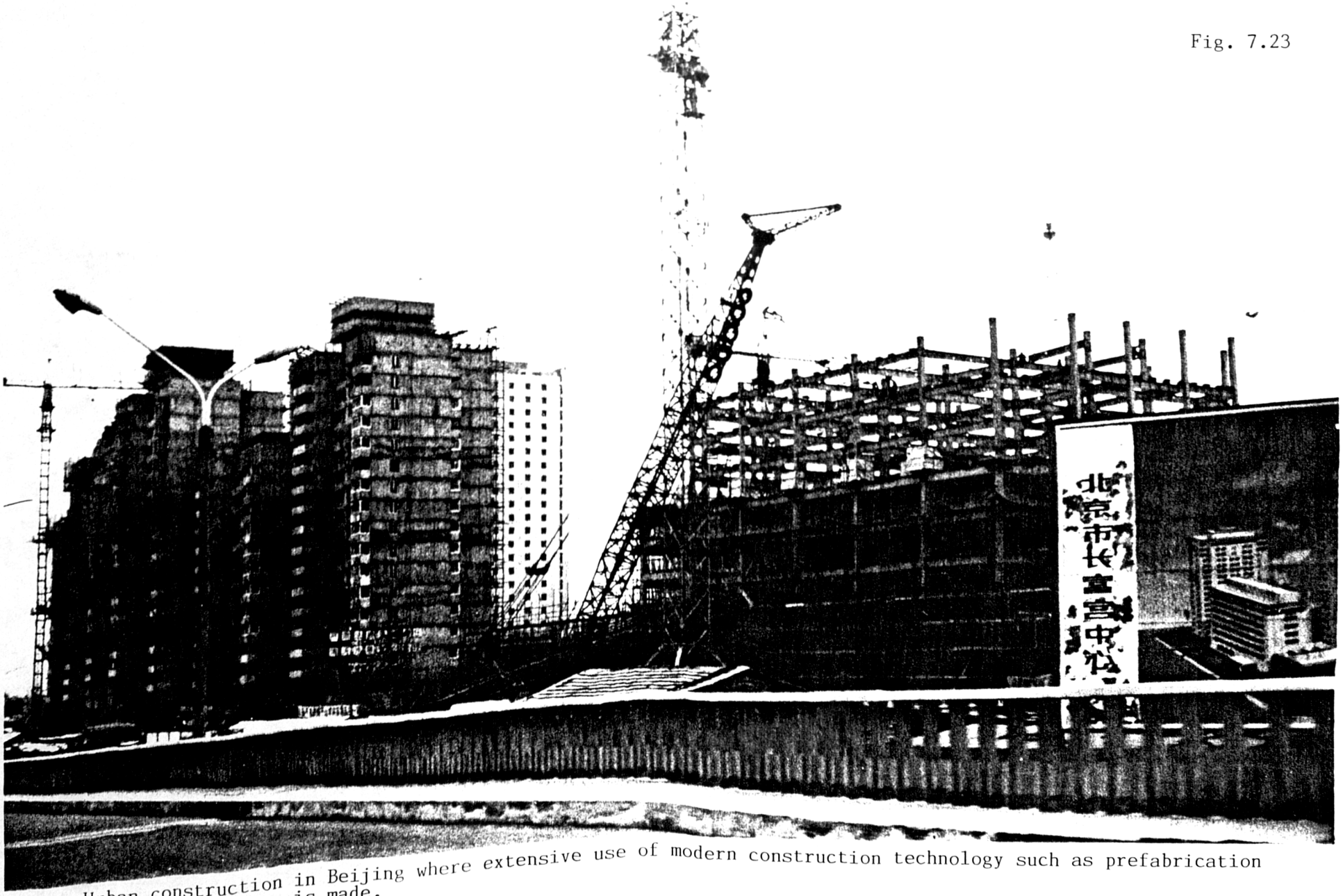
The study has shown that appropriate technology in the construction industry in China has played an important role in the development of the rural areas in particular, and also in the urban areas in the years following the socialist revolution. However, it is important to notice that this has been achieved only through the unique method of implementation in a society where it has been backed up and promoted institutionally and based on the goals of self-sufficiency and independence. Appropriate technology was chosen as a base for development by the leadership and adopted in various aspects of public life in both the rural and urban areas, not only in the construction industry, but also in energy technology (Zhang Ji-G et al Mimar 1983) and public transport, with the most apparent sign being the use of bicycles in every corner of China. However, China is very diferent in 1987. It seems that the country has passed through a period of consolidation, during which time it developed an organised infrastructure, social services and industrialisation. Ever since the end of the Cultural Revolution and early 1980s, the goal of modernisation has been set and the country is geared for significant changes with a different emphasis on development (Figs 7.24 and 7.25). It is

Fig. 7.22



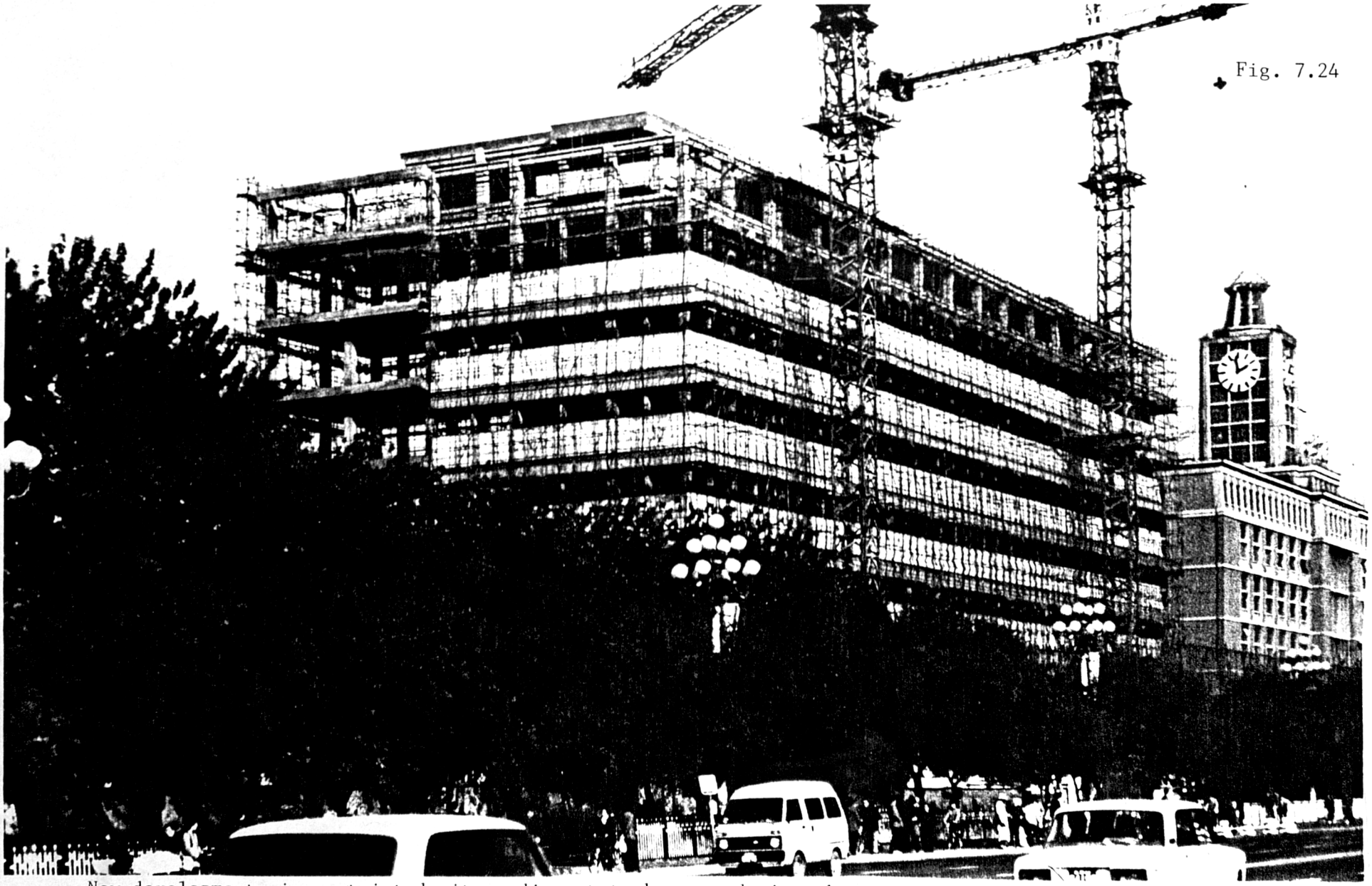
The South Lake District one of the many new residential districts built in recent years near Nanjing. Many of such developments are made with extensive use of prefabrication method of construction.

Fig. 7.23



Urban construction in Beijing where extensive use of modern construction technology such as prefabrication or steel structure is made.

Fig. 7.24



New developments in restricted sites adjacent to busy roads in urban centres often requires sophisticated technology and site management. The Chinese construction industry has in recent years acquired such sophisticated capabilities.

Fig. 7.25



One of the many new international hotels constructed in major cities of China. This particular development in Beijing is an example of post modernism architecture in China designed by Professor Hu Shao Xue and Professor Li Daozhen.



Fig. 7.12e

Another example of modern office developments which have changed the urban scene in Beijing and other major cities of China.

important to remember that even during the Cultural Revolution, whilst there was much emphasis based on the use of appropriate technology in the field of construction, at the same time long term plans were drawn up for the development of the construction industry in order to achieve a degree of sophistication which would enable the industry to meet the requirements of China in the years ahead.

Today the construction industry has reached a level of sophistication which allows it to use modern technology for the construction of nuclear power plants, a sophisticated railway network and large scale commercial and housing development and international construction in many countries, thus competing with other international contractors from the industrialised countries. The lessons which can be learnt from China by countries such as Iran could be particular aspects of long-term planning, resource management, flexibility and standardisation. Standardisation is perhaps one of the most striking features of the construction industry in China, and can clearly be seen throughout the country. Examples can be found in the universal use of prefabricated panels, which can be built both in small purpose-built workshops in smaller cities and rural areas or large scale production plants in big cities.

It is probably appropriate to mention that because of the current state of thinking in China, unfortunately most professional people consider many aspects of the country's achievements inferior to those of western countries, and the notion of modernisation at least in the field of housing, is seen in terms of high rise, prefabricated developments. In fact this issue created much debate during the Conference on Housing Planning and Design. Whilst most of the participants from the western countries were giving countless examples of various development schemes which have failed in their countries, the majority of the delegates from China were promoting the idea of high rise residential developments. The same change of attitude is visible in the official media; for example the following extract is from a speech by the Minister of Urban and Rural Construction and Environmental Protection in "China Reconstructs" on the subject of housing development;

> "The quality of housing has improved. New housing units all have running water and electricity, with shops, schools and places of entertainment located conveniently near. Beijing, Nanjing and Changzhou are good examples of

> these improvements. Thanks to advances in architectural design and technology, rows of high-rise apartment buildings can be found in most of China's cities." (Rutang Ye 1987).

An important feature of Chinese planning which is relevant to this discussion is the importance that is attatched to the role of small and medium sized cities. This policy not only has proved an effective deterrent to urbanisation, but at the same time has proved a good basis for developing small scale industries, especially those producing construction machinery, materials and consumer goods, whilst utilising the local resources fully. The urban population of China will be around 250-300 million by the year 2000; this is equal to the whole population of the United States and will place a great burden on the Chinese planners in their task of meeting the requirements of so many people (Kirkby, 1988). As industrialisation proceeds, so the emphasis on agriculture decreases and there will be a population of around 300,000,000 looking for alternative jobs in the urban areas. Currently one idea which seems to be the preoccupation of the Chinese strategist is that in order to absorb this demand they will probably need to construct either 150 new cities of 2 million, or 300 cities of one million inhabitants. It is obvious that the construction industry is going to have to play an important role in regional planning. The housing situation in China is already acute and the quality of housing quite inadequate in many cities, with a large number of sub-standard dwellings. If the construction industry is to meet the task of housing the present and future population, it needs all the resources to be channelled so it could deploy both modern and appropriate technology in order to face the future. As a consequence of the "four modernisation" policies the Chinese planners have set their development goals along the lines of those of western and other industrialised countries including Japan. This chapter has provided an insight into the mobilisation of resources in China by a centralised planning process. The construction industry has developed on the principles of self reliance, and now on the basis of modernisation.

Another country which faced major reconstruction efforts in the post Second World War period is Japan. Japan's effort at reconstruction, contrary to that of China, has been based on a great deal of private sector contribution with significant government support. In this endeavour, the Japanese planning

and construction process has made a big contribution. The following chapter will focus on the examination of the planning process and the contribution of the construction industry to overall development in Japan.

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CHAPTER 8

8:1 Introduction

Chapter Seven presented the process of planning and construction in Chin through an analytical account of the National Development Strategies on the one hand and the performance of the Construction Industry on the other. It was concluded that the nature of economic and physical planning had a direct impact on the choice of construction technology and resources (Hypothesis 2). This chapter sets out to validate Hypothesis 3:

> National Development Planning and Physical Planning Strategies have a direct impact on the performance of the Construction Industry.

In order to facilitate the above, this chapter will, therefore, examine the following issues within the context of a capitalist society;

> The impact of land use planning policies on the construction industry.
>
> The role and significance of the private sector in the planning and construction process;
>
> The impact of government action on construction companies.

Following the examination of development planning in Japan the chapter provides a detailed account of the nature of the construction industry in that country. There are different actors in the development process in Japan whose roles are examined in this chapter with an analysis of the effectiveness of the policies adopted by different agencies in charge of the development and implementation of projects.

8:2 The General Setting

In the aftermath of the Second World War the Japanese were faced with massive reconstruction tasks, including the derelict state of industry and all levels of infrastructure. The speed of economic and physical reconstruction of Japan has aroused interest worldwide. As Masser notes;

> "In recent years there has been worldwide interest in Japan from both the developing and the developed countries in the eastern and western world. As a result, 'learning from the Japanese' has become a minor growth industry (Masser, 1986, p123).

Most visitors to Japan are impressed by the strength of its economy and the extent to which the Japanese appear to have adapted ideas from other countries to their own requirements. However, for the purpose of this thesis, the interest lies in the manner in which the Japanese planners have managed to cope with the pressures of urbanisation, which occured more rapidly than in any other country. In this thesis we will concentrate on the economic development and land use planning in so far as they affect the shape of the Japanese construction industry. Therefore, by briefly examining the nature of development planning and land use planning, it is attempted to show how land use planning is used in conjunction with the construction industry in the development process. It will be shown, through examples, how policies are formulated to encourage the partnership between private and public sectors through adapting innovative methods.

At first impression most observers of the Japanese economy point to the strength of exports mainly of consumer goods, but it is another aspect of the economy which has proved to be a major factor in the economic development of the country. With more protectionist market measures and political pressure on the Japanese government to curtail its exports to other industrialised countries, the Japanese economy has shifted from an external to a domestic "demand-led" structure, in an effort to avoid trade frictions and a high "yen-led" recession (Shishido 1987). One way of absorbing a sudden reflationary economic policy amounting to Y6 trillion has been heavy investment in the construction sector in the form of public investment in housing. This has provided growth to the housing construction consumer expanding and private capital investment sectors of the national economy (Shishido, 1987). Public investment is seen as a measure to change regional infrastructure and develop the growth potential of regional communities and also yield high production inducement and job creation effects capable of quickly stimulating the economy and providing job opportunities. The view is that, when supported by the development of infrastructure, comprehensive strategic projects can produce timely and multiple effects.

The construction industry is seen as a major sector which plays a vital role in the economic well-being of that society. It is through this sector of the economy that the task of improving the quality of living standards and the improvement of the environment in urban centres is carried out. This is done by adapting land use policies which have a high degree of public participation and making efficient use of private sector investment in the construction sector.

Apart from the destruction incurred during the Second World War, Japan suffers from natural disasters such as flooding, earthquakes and land slides. The Japanese construction industry has been responsible for devising preventive measures in order to minimise the damage caused by such disasters. In order to achieve this a comprehensive system of land zoning, river administration, mechanism of building land supply administration, urban planning administration, road administration, government building administration, and supervision of construction industry is in place (MOC 1988). Figures 8.1 and 8.2 show the earthquake resistant modern office buildings in Shinjuku district of Tokyo.

8:3 National Development Planning

Japan has a long tradition of planning (Watanabe, 1980), as illustrated by the City Planning Act of 1919. According to Tamura (1977);

> "A basically centralised Act aiming to achieve 'national profit', not 'citizen society' thus producing state prosperity, rather than a good planned environment". (Tamura 1977, cited in Fujimori, 1988, p4).

In fact various writers on Japanese planning (eg. Alden, 1986) explain the planning practice in Japan through different phases. These phases are: the so called the pre-modern Japan i.e. before the Meiji restoration in 1868 (Watanabe 1980); the second period of planning commencing with the Meiji restoration; and finally the third period of planning, which commenc-



Fig. 8.1
The famous headquarter of Yasuda Insurance Company in Shinjuku (Tokyo) an example of earthquake resistant high rise development.

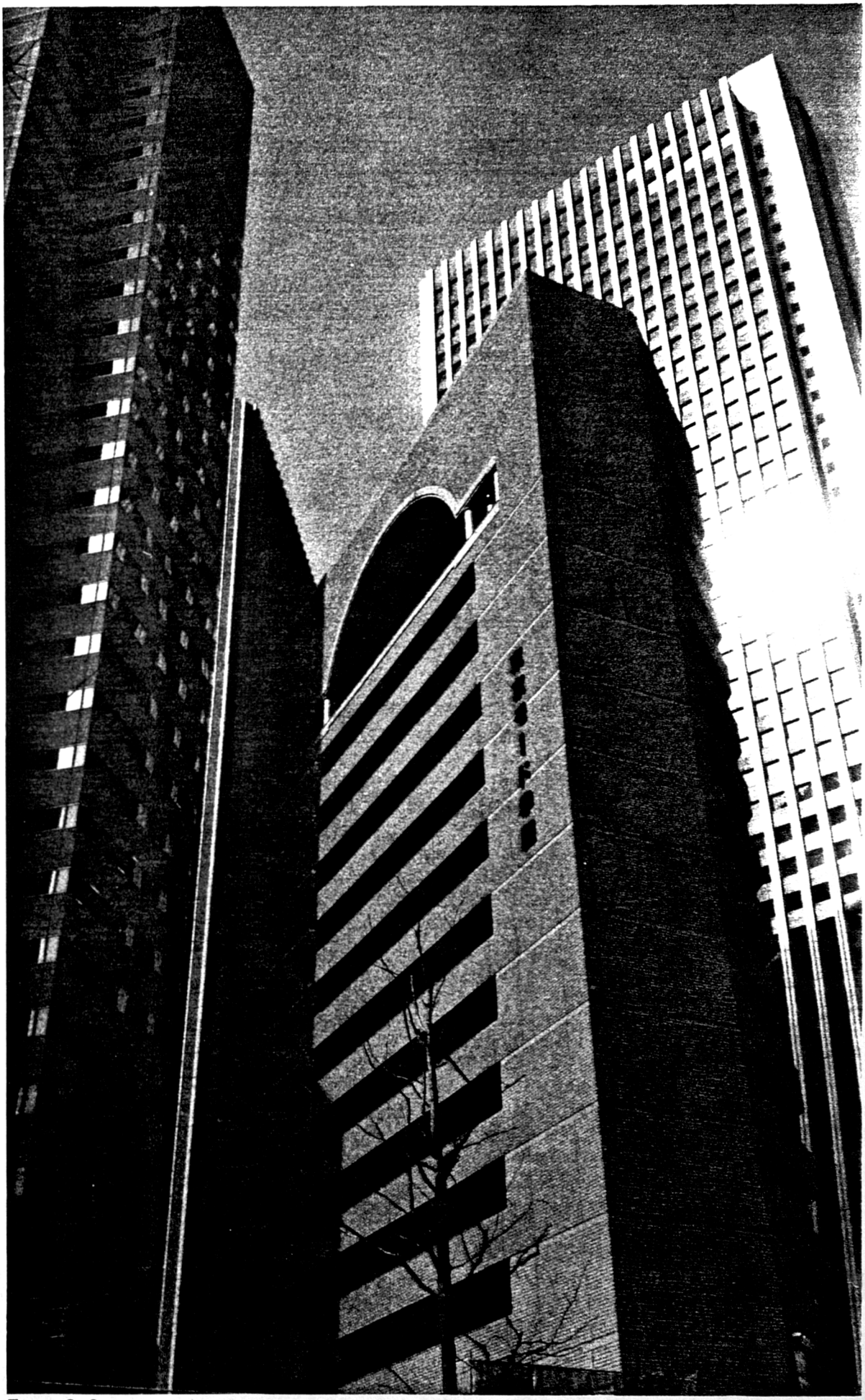


Fig. 8.2
Modern high rise earthquake resistant office buildings in Shinjuku. Tokyo.

ed in 1912 (Alden 1986). The City Planning Act of 1919 was the basis for first attempts at a comprehensive planning system.

Economic development planning in Japan is carried out by the Economic Planning Agency (E.P.A) and land use and development by the N.L.A (National Land Agency) in the form of National Comprehensive Development Plans (Sanzenso) of which four have been prepared. The first NCDP was in operation in 1962 and it was prepared by the Economic Development Agency to last until 1970. The first three NCDPs have each been;

> "a major statement of development goals for its time, setting out the basic principles according to which investment is to be allocated as between regions of Japan and identifying key projects." (Hebbert, 1986)

Japan's planning system, whilst having its own identity, has also adopted and incorporated elements of Western European and North American planning. Some elements of Western Planning which have been adopted include the Green Belt Policy, the New Towns Movement, and Comprehensive River Basin Development similar to that of TVA in the U.S.A. in the form of Pacific Belt Development. However, Japanese professionals believe that, although such theories originated in the west are adapted by the Japanese planners, in practice they have not been implemented. For example although some measure of comprehensive regional development on the basis of the T.V.A did occur, they had limited success (Shin-kentiku 1980, p174). The first NCDP adopted a growth pole strategy. As the result of two acts, the New Industrial Towns Development Act 1962 and the Industrial Development of Special Areas Act, 1964, 15 new industrial cities together with six special areas for industrial development were designated. The First NCDP aimed at directing industrial investment along the Pacific Coast and the improvement of public transport facilities (Fujimori 1988).

The second NCDP published in 1969, whilst focussing primarily on economic development, contained some elements of environmental and welfare objectives. It was during this plan that the construction of the Shinkansen (Bullet Train) railway sytem took place, and as the consequence nine out of ten cities of over 1 million population were linked. As the result of problems caused by urbanisation and congestion in the big cities this programme was amended (Fujimori 1988).

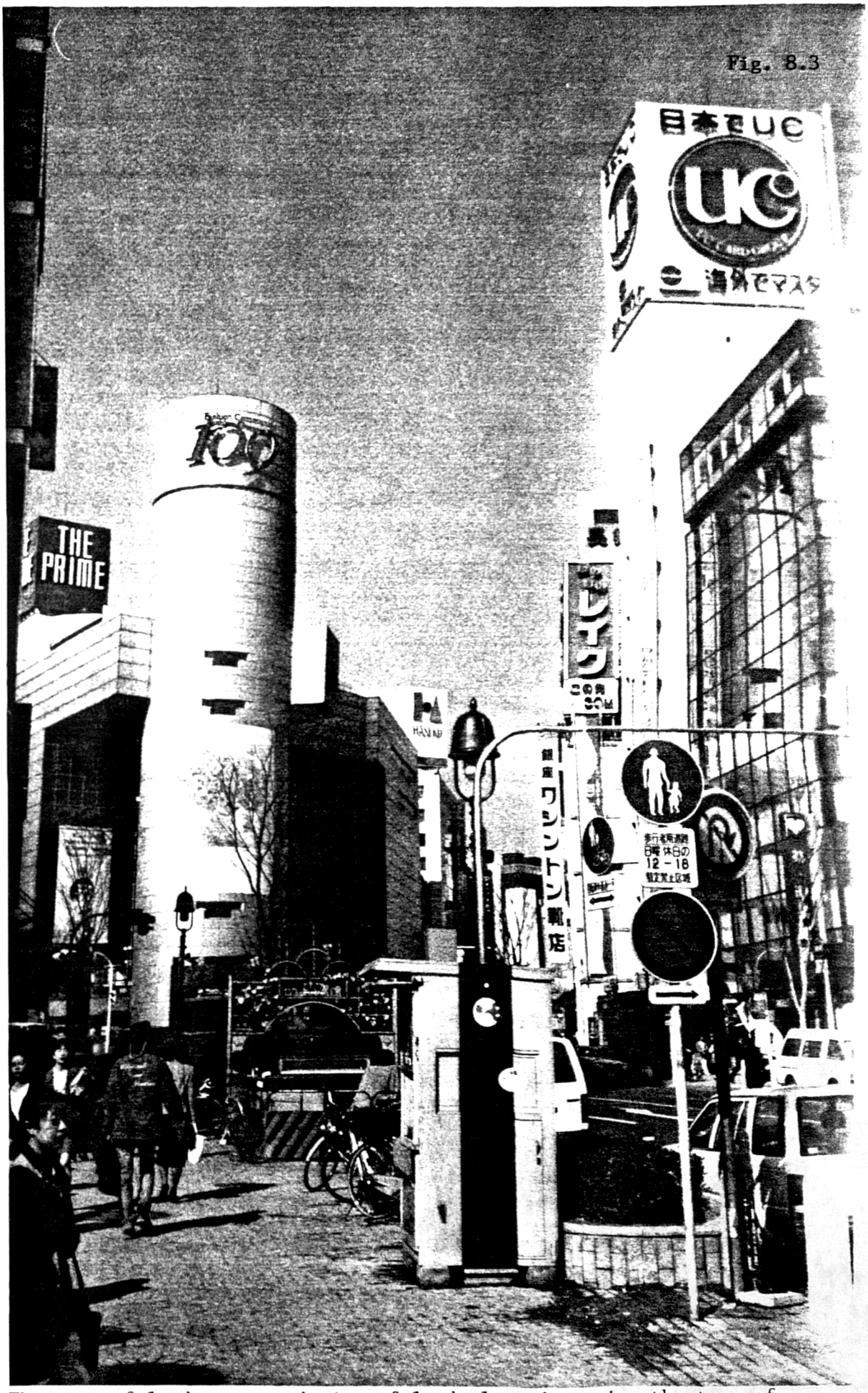
The Third NCDP was prepared by the National Land Agency (NLA) which had replaced the Economic Planning Agency (EPA) in 1974. The fundamental objective of the plan is refered to as "the Integrated Residence Policy" and thus aimed at developing and improving, on a systematic basis, an environment fit for human habitation with harmony between people and nature, making the best use of regional characteristics with consideration given to the fact of the limited national land resource. However because of political implications and controversy surrounding the concept of the Garden City Policy advocated by Ohira, then Prime Minister, in 1983 the NLA announced that the implementation of the plan was impractical. Therefore, the NLA embarked upon the preparation of the Fourth Plan to direct the development of Japan in the next century (Sotomura, 1988, p20). The Fourth NCDP was launched by the NLA in 1987 due for completion in the year 2000. The objectives of the Plan is to provide a measure of regional distribution of political, economic and cultural institutions, thus reducing the burden on Tokyo. (Fujimori 1988, p7)

The previous analysis of the concept of national development planning, either by choice or out of necessity has been concerned with problems of urbanisation, limited supply of land and thus the policies devised have had to create a balanced urban development. The extent of urbanisation can only be measured against other industrialised countries through the analysis of some data. Various publications on this subject (including the OECD 1986 report which was requested by the Japanese Government) provide sufficient sources of reference and therefore this dissertation will not dwell for long on this matter.

8:3.1 The Hierarchy of Japanese Planning

There are two types of plans in Japan; the first type are those referred to as Upper Plans and the other type are called Lower Plans. Accordingly there are different government agencies dealing with these plans; for example the National Land Agency is in charge of the Upper Plans and the Ministry of Construction (M.O.C) deals with the Lower Plans (Sotomura 1988 p3). The Ministry of Finance exercises its control over the total volume of public investment (Hebbert & Nakai 1988, p34) whilst the Ministry of Home Affairs and the Ministry of Trans-

Fig. 8.3



The type of land owner and size of land plots determine the type of development in urban areas of Japan. For example the area shown in this photograph (Shibuya Station) is the result of incremental development offering variety in function and design of buildings.

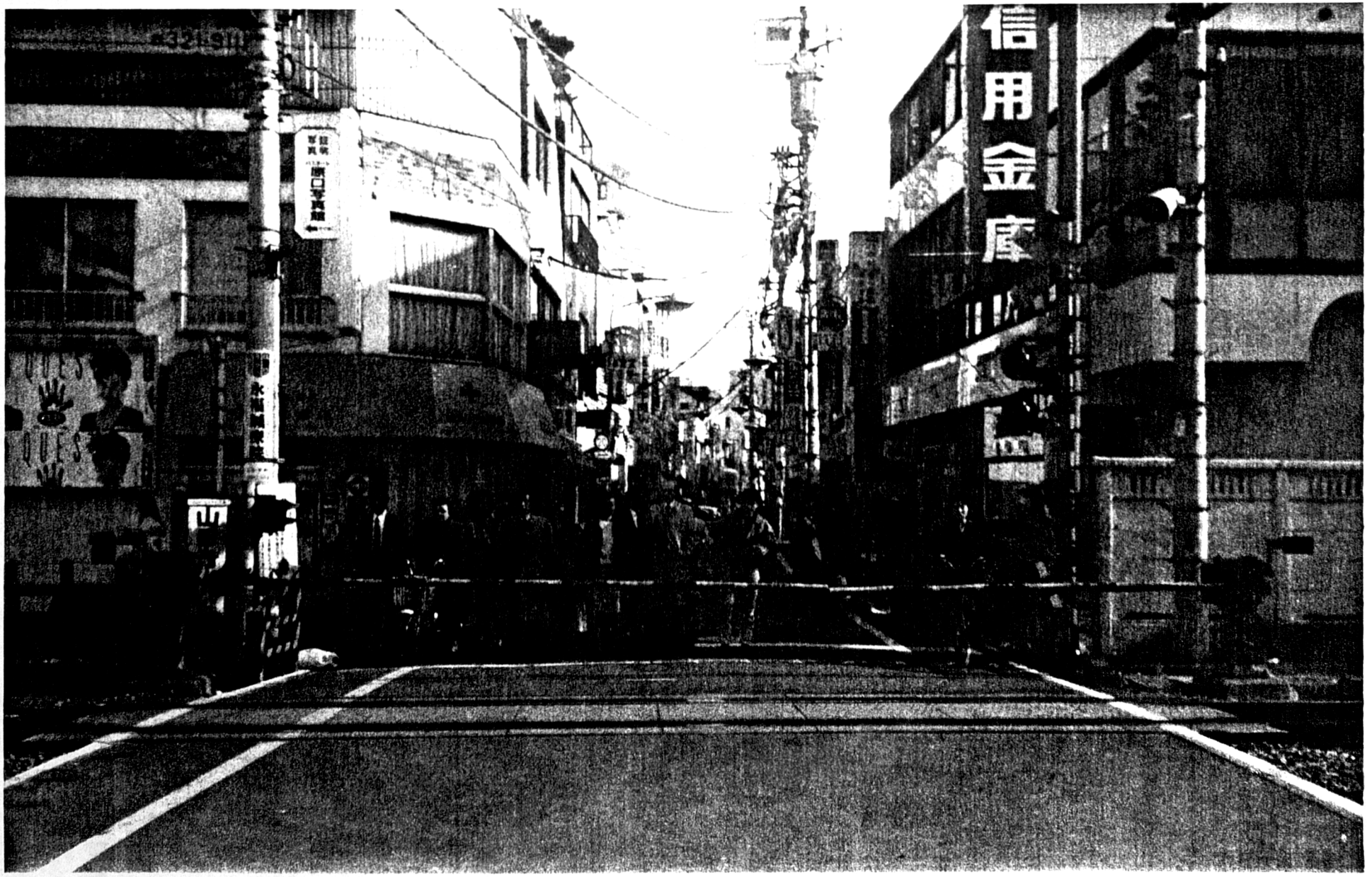


Fig. 8.4
The photograph shows a typical scene a mixed residential and commercial area in Eifuku.

port are responsible for the administrative aspects of local government. Other agencies include the Ministry of Agriculture, Forestries and Fisheries which is involved in agriculture and rural planning. The Ministry of International Trade and Industry (MITI) is also involved in aspects of industrial policy and industrial location.

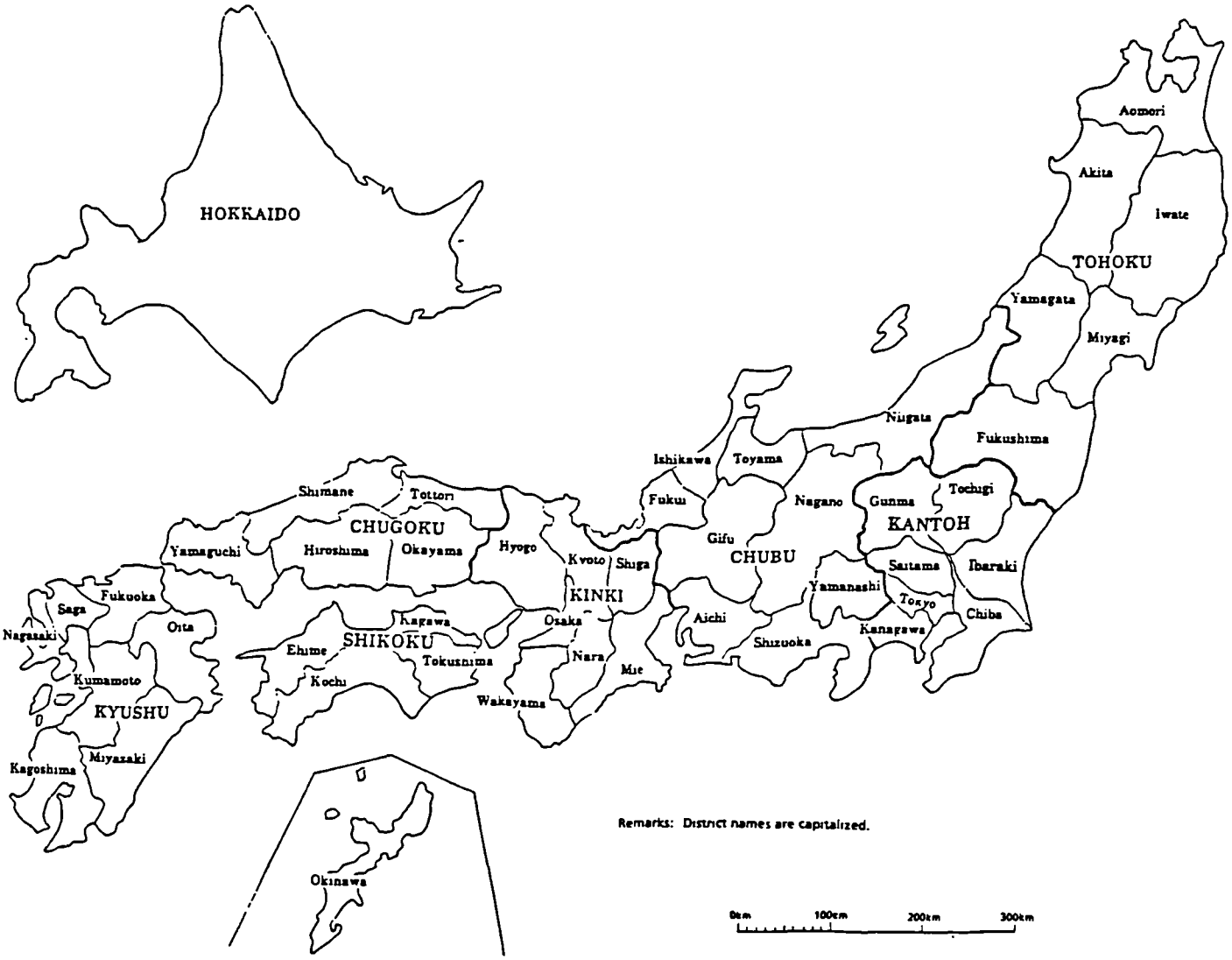
Upper plans which include national and regional plans are produced by the N.L.A for the Central Government. Lower plans on the other hand consist of Prefectural and Municipal plans. Japan has 47 prefectures (todo-fu-ken), ten designated cities (shi) with a population of over 500,000, each three major Metropolitan areas (Tokyo, Osaka and Nagoya), and seven rural regions (Diagram 8.1). Each prefecture consists of Municipalities (shi-cho-son), towns (cho) and villages (son) (Alden 1986, p129).

In order to focus more on the notion of urbanisation in Japan and to show the preoccupation with prevention of urban sprawl in Metropolitan areas of that country it must be pointed out that the housing situation in Japan from a qualitative point of view is to some extent inferior to other industrialised countries. For example 11.4% of the households in urban areas live in substandard housing (miminum housing standard for four people is a unit of 50 sqm floor area, comprising three bedrooms, a dining room-kitchen) and 50.9% live below the average housing standard (MOC 1987). This is a fact well known by the Japanese Government and planners and, for this reason, land use planning with regards to urban development is given prominence. This has had fundamental impacts on the construction industry in Japan.

8:3.2 City Planning & Urban Development

In 1974 the National Land Use Planning Act extended the domain of the 1950 Act and initiated the concept of a long term national land use plan. As outlined in the 1986 OECD report, a National Land Use Plan was required in addition to the Comprehensive National Land Development Plan (CNLDP) of the 1950 Act, thus more emphasis was put on prefectural and municipal plans. The first CNLDP was drawn up in 1962. Various CNLDPs have shown a preoccupation with preventing urban sprawl, the effective utilisation of land and the promotion of local development (OECD 1986, p39). It is this preoccupation that

Diagram 8.1: Prefectures and Districts of Japan



Source: White Paper on Construction 1987, compiled by Ministry of Construction, Research Institute of Constuction and Economy.

has forced Japanese planners to rely on different approaches regarding planning policies in order to solve much of the urban sprawl and shortage of good quality housing. These approaches have been backed up by a series of sophisticated planning acts and legislation in order to direct both economic and physical development in that country. Various acts have designated areas where urbanisation is subject to control or promotion. In order to curb the ever increasing metropolitan growth, the MOC campaigned for a measure of development control and the result of this was the City Planning Act 1968 (Hebbert et al 1988, p34-35).

Furthermore the extent of the increase in urbanisation which Japan witnessed in the 1950s and 1960s forced the Japanese government to take measures to combat these problems. Various bills were passed and resulted in a series of planning tools which have characterised the land use planning process in Japan. The 1950 Building Standard Law, closely related to the City Planning Law, provides for a minimum standard in the construction of individual buildings, and at the same time defines detailed limitations in zoning (Irisawa et al 1974). Two systems of planning in urban areas are in use which categorize the urban areas into two zones where urbanisation either will or will not be promoted. The City Planning Act only covers those areas of the country which are designated as "City Planning Areas (CPAs)", which in turn are designated by prefectural governments pending the approval of the MOC after consultations with appropriate interest groups such as municipalities (Nakai 1988).

The Land Lot Adjustment Law of 1954 and the Urban Redevelopment Law of 1969 were enacted to guide the redevelopment of existing urban areas. For the development of new urban areas, the New Residential Town Development Law of 1963 was devised to regulate the procedure of large scale development of urban areas (Irisawa et al, 1974). A City Planning Area according to the act is defined as:

a) an area consisting of an existing built up area and its surrounding area which can be regarded as one urban area, and

b) the area which has not been urbanised so far but has been recognised on planning grounds that should be urbanised on a systematic basis.

Diagram 8.2 outlines the mechanism of urban planning and administration. The City Planning Area is in turn divided into Urbanisation Promotion Areas, Shigaika-Kuiki (UPAs), and Urbanisation Control Areas, Shigaiaka-Chosei-Kuiki (UCAs) (Hebbert 1988). The concept of city planning and the nature of UPAs and UCAs are demonstrated by Diagram 8.3. Within the UPAs one planning policy regarding land use planning, i.e. Land Readjustment Technique, has been extensively in use for a relatively long time in an effort to control the development process and also provide a sufficient level of infrastructure. The following section, however, focuses upon the activity of the Ministry of Construction as the main agency responsible for much of planning and development in Japan.

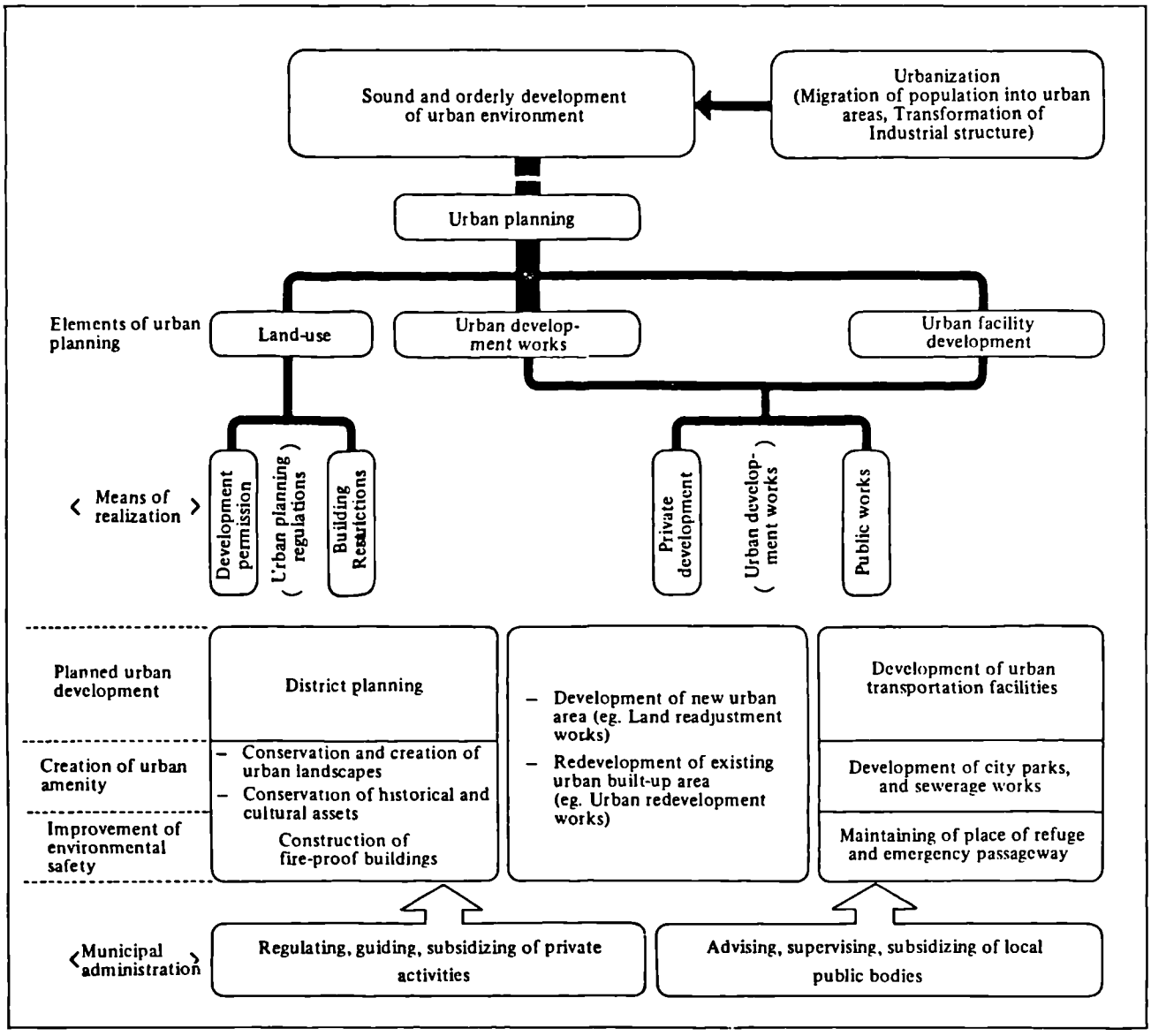
8:3.3 City Planning Administration

In 1987 the Ministry of Construction (M.O.C) celebrated its 40th anniversary. In the past forty years the M.O.C has been involved with land preservation, water resource development, road improvement, the provision of urban infrastructure, housing construction and the promotion of the construction and real estate industries. Diagram 8.4 sets out the span of control and the Organisational Hierarchy of the MOC (Ochi 1987).

As already stated, apart from the NLA, the MOC is the Ministry most directly concerned with the land development system, and its activities also cover all development and construction activities as well as urban planning, road construction and river management (Hebbert et al 1988, p34). The MOC has five main Bureaux, including: Economic, City, River, Road and Housing. The MOC's hub of control and involvement reaches into prefectural and municipal levels by means of direct contact or the secondment of personnel, and an extensive network of local offices (OECD 1986, p29). Together with the cooperation of the National Land Agency, the MOC has the overall responsibility for the initial formulation and eventual implementation of policies regarding the urban areas of Japan. It has already been explained that the notion of housing and urban revitalisation attracts a large degree of attention from the government, and the Ministry of Construction, as the agency responsible for this task, has to accommodate the government's

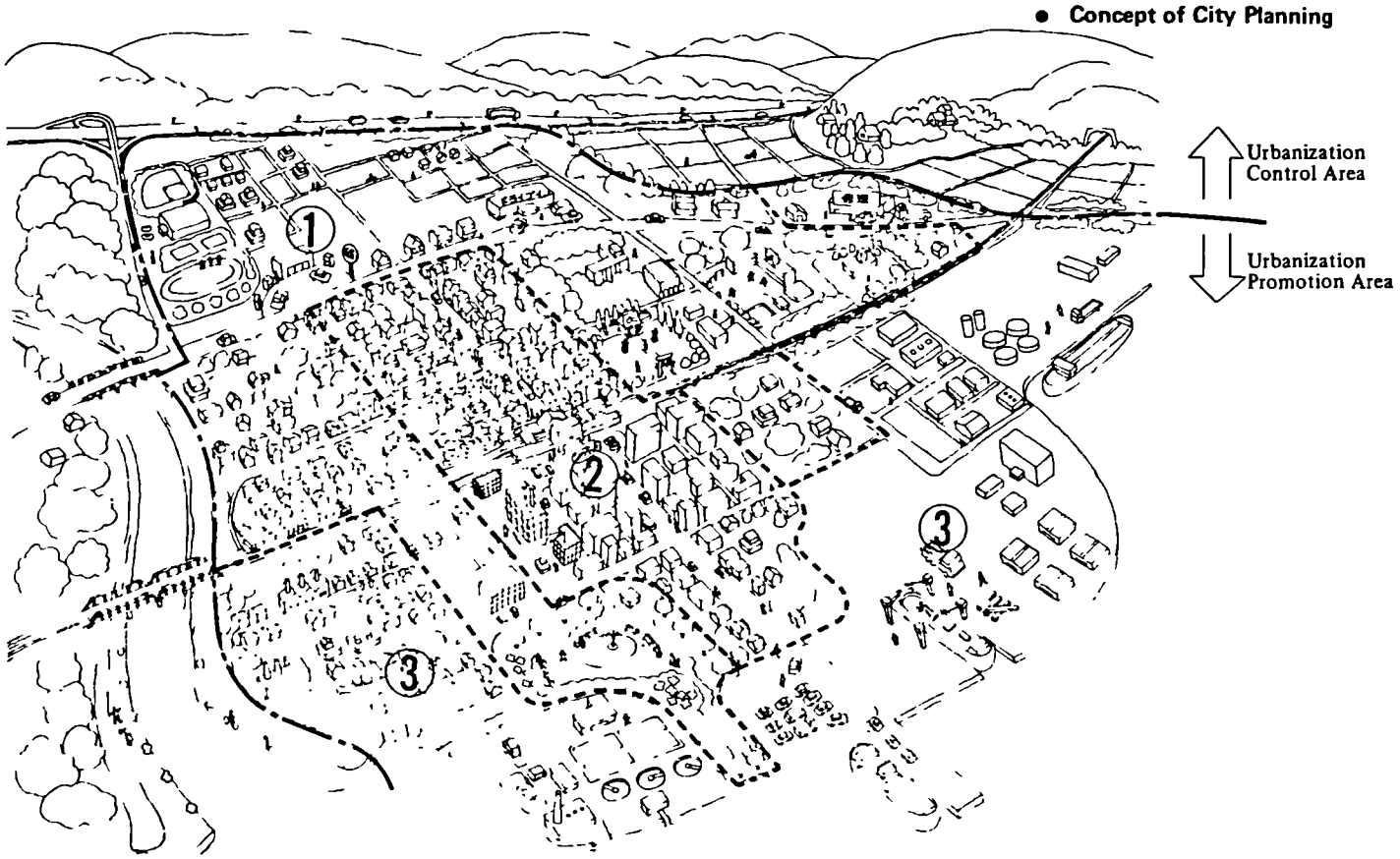
Diagram 8.2: Mechanism of Urban Planning Administration

- **Mechanism of Urban Planning Administration**



Source: Activities of the Japanese Ministry of Construction - at a glance, Ministry of Construction. Published by International Engineering Consultants Association (Japan), 1987, p6.

Diagram 8.3: Concept of city planning and the nature of UPAs and UCAs



① Residential zone

② Commercial zone

③ Industrial zone

City Planning Area

Total City Planning Area in Japan:

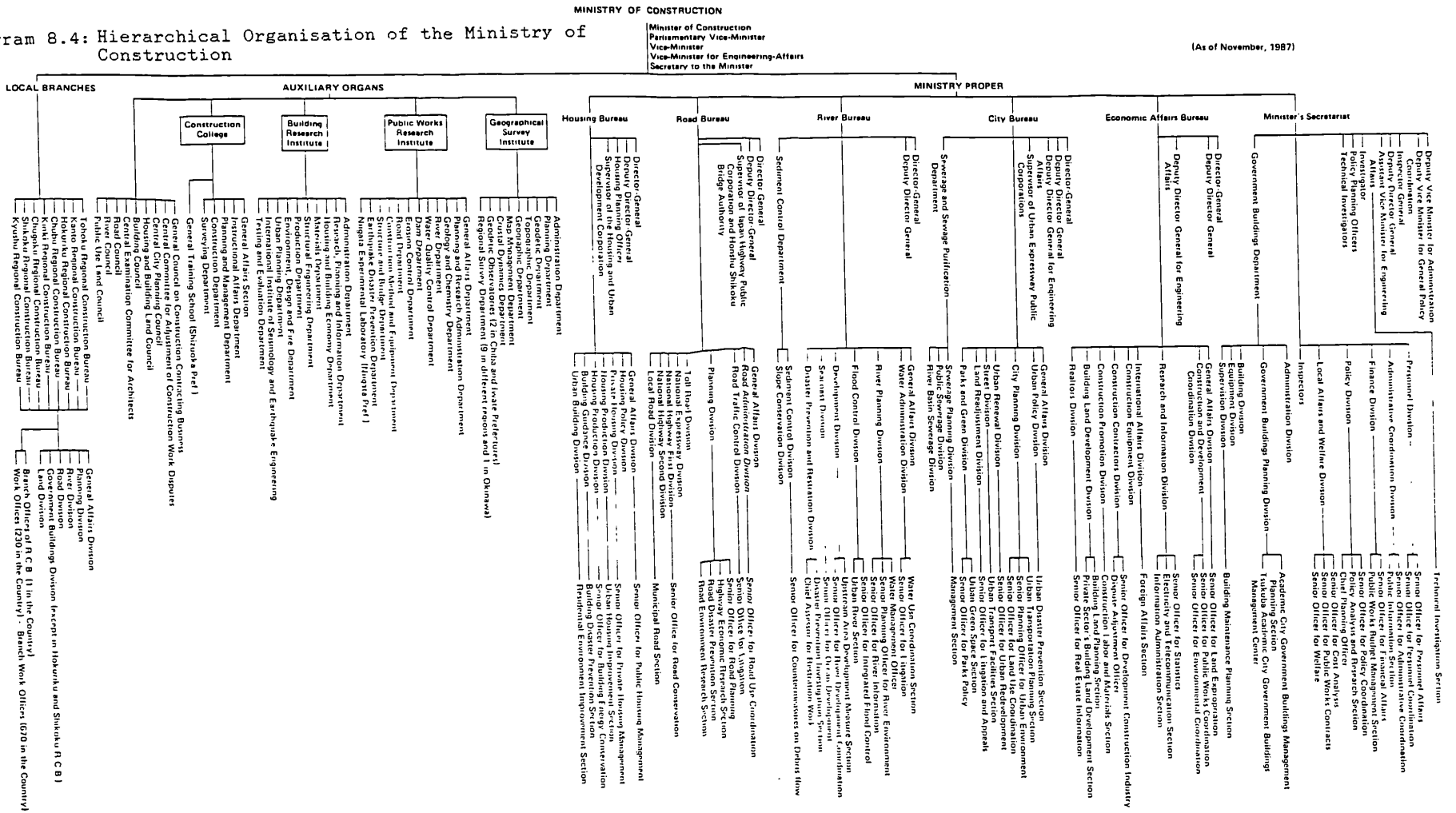
91,271 sq km (24% of the national teritory)

Total population of City Planning Areas:

104,281,000 (89% of national population)

Source: Activities of the Japanese Ministry of Construction - at a glance, Ministry of Construction. Published by International Engineering Consultants Association (Japan), 1987, p7.

Diagram 8.4: Hierarchical Organisation of the Ministry of Construction



Source: Activities of the Japanese Ministry of Construction - at a glance, Ministry of Construction 1987. Published by International Engineering Consultants Association (Japan).

Fig. 8.5



Business District in Hanzou-Mon. The building in the foreground is an example of 1980s Japanese Modern architecture and is the Headquarter of WACOAL the major specialist clothing manufacturer.

Fig. 8.6



The commercial area near Shibuya station (Tokyo).

housing aim which is:

> "to provide housing that will enable the people to live securely in a good residential environment, taking into account the family composition, the process of household growth and the neighbourhood". (OECD 1986)

In order to achieve these goals the MOC has devised five year construction programmes concerning the issue of housing. As the price of land in metropolitan areas of Japan is very high, and thus a large volume of public investment for the purchase of land and the provision of infrastructure is required, various initiatives have been taken which have formed the basis of housing policy. The situation in the urban areas is a complex one exacerbated by the extent of urbanisation, the shortage of good quality housing, urban sprawl and the decreasing government expenditure in public programmes investment due to high land prices (MOC 1988). In order to alleviate this situation and achieve the stated aim of enhancing the quality of amenities in the metropolitan areas, the MOC has had to help create the necessary process of implementation. The task of implementing of the development programme is carried out by the construction industry in Japan. This has been possible with continued efforts in Research and Development in administrative and technological fields by both the public and private sector of the Japanese construction industry.

8:4 The Characteristics of the Japanese Construction Industry

It is important to state the reasons for and intentions of looking at the case of the construction industry in Japan and its relevance to the overall context of the thesis. A number of questions need to be answered. Amongst these the most prominant should revolve around; what makes the construction indus_try unique, what is it that has given rise to so much worldwide interest, even from other modern and industrialised countries? Is the experience of Japan relevant in any way to the situation in Iran, or does the fact that there are cultural differences between the two countries make this connection irrelevant?

The construction industry accounts at present for one fifth of the Gross National Product, and the industry also employs about 5.3 million workers, accounting for 10% of the total number of employees (Ministry of Construction 1987). In their study of the Japanese Construction Industry commissioned by Capital and Counties, Bennett et al (1987) single out the industry as yet another area where the Japanese will pose a serious threat to western construction industries and therefore the construction companies at the international level. They seem to be impressed with the long term strategy and the so-called "Japanese approach of inter-industry joint ventures" and they go on to add;

> "adopting this approach would require a commitment to undertake long term research and development between construction, manufacturing and electronics firms and the universities. The pay-off would be longer term and perhaps less certain. Outside the USA it may well need international cooperation to be effective. However, it may be essential to adopt such a risky long-term strategy if European industry in the 21st Century is to have a share in the 10 per cent of world growth product which construction provides. The only other option is to surrender yet another industry to Japan". (Bennett et al 1988, p82)

There are two features which are unique to the Japanese construction industry. The first feature is the large number of small firms and individual operators, 99% of the companies having capital of less than $500,000, and 95% employing fewer than 30 people in 1984 (MOC 1984). On the other hand, there are very few large companies who carry out the largest part of the work in the construction market. Through a mechanism of tendering and qualifications for tendering which is applied to contractors for the award of contracts, the large businesses apply for large national projects whilst smaller companies compete for small regional and local projects. In fact the Japanese government, with the adoption of regional policies, promotes and supports small companies and sub-contracting.

There are interesting unofficial systems of co-operation between companies which are practised widely but not recognized officially and there are uniquely Japanese. Mention can be made of situations where a number of companies decide to reach an understanding between themselves that if there is not

enough work to go round in a particular area, if one company wins a contract (both public and private) this year, then next year it will not compete for any job and one of the other companies thus takes the contract. This understanding is reached through a sophisticated and difficult process of negotiation which is truly Japanese and, although widely practiced by both big and small businesses, officially it is illegal. The nature of such practice will be detailed in the next section of this chapter. Another practice is called 'zaikai', the way the big businesses co-operate and try to influence the government. Zaikai replaced another practice which was called 'zaibatsu' (money cliques), according to Bennett et al (1987); these were a group of large companies which were exerting influence over the working of the government. In 1947, however, with the introduction of the Law of Elimination of Excessive Concentration of Economic Power, zaibatsu were dismantled. Zaikai leadership is formed from the top executives of business organisations which in turn forms the Federation of Economic Organisations. It should be noted that the Japanese consider as dangerous discussions on the practice of Zaibatsu. The recent political scandals involving illegal financial activities by industrialists and politicians indicate the extent of such practices.

Table 8.1: Number of construction companies in Japan classified by the size of capital

Year	Total No of enterprises	Individuals	Firms & Companies with capital of $1000's				
			<30	30-60	60-600	600-6000	>6000
1975	350,817	56.6%	29.9%	6.5%	6.3%	0.5%	0.2%
1980	488,520	54.1	28.0	8.6	8.6	0.5	0.1
1984	515,729	49.4	27.8	11.0	10.4	0.6	0.1

Source: Ministry of Construction 1984.

As was seen in Chapter Four, a similar set of powerful business clubs were in existence during the 1970s in Iran which had close contacts with the government of the day and thus made sure they would receive their share of the market. This

was particularly true when, in the 1970s, the government chose the strategy for the 'crash housing programme' and decided to embark upon large scale building activities using industrialised building system carried out entirely by the private sector (McCutcheon 1979).

According to Hippoh (1984), two landmarks act as the standing point of the construction industry in post-war Japan: the first was the establishment of the MOC in 1948, and the second the enactment of the Construction Contractors Law of 1949.

These policies by the central government were adopted in order to prepare for the post war reconstruction of that country including:

a) agricultural civil engineering works on facilities for food production increase;

b) flood control against indiscriminate deforestation caused by lumber demand for the reconstruction of wooden houses, etc

c) the U.S Army's military facilities works, which brought about changes in and modernisation of, construction management and industrial relations

This clearly illustrates the type of strategy adopted by the Central Government in order to revitalise the construction industry for national reconstruction. In the next sections of this chapter it will be shown how this effort was particularly enhanced by high levels of investment. The extent of investment in construction is evident by the fact that investment in the sector grew by nineteen times between 1960 and 1979. The subsequent affect of this in economic terms has meant that during a period high economic growth the GNP share of construction increased from 15% in 1969 to 20% towards the end of the 1970s. According to Hippoh (1984), from the analysis of construction investment, it is evident that residential construction contributed to a constant growth of the building sector.

It is interesting to note that most observers of the construction industries in the modernising countries argue that the construction of large national projects do little to contribute to the construction industry of these countries, but in

Japan's case such projects helped to stabilize demand and construction employment in that country. These projects included the construction of facilities for the 1964 Tokyo Olympics, the International Osaka Exposition of 1970, the Okinawa International Ocean Exposition of 1975, Potopia at Kobe 1981 and Tskuba Expo 1986 (Table 8.2). The following section provides further detail of the major trends which have occurred in the construction industry during the high economic growth period of 1955-1973 and early 1980s, especially in the urban construction process.

8:4.1 The Urban Construction Process

The Japanese construction industry has been particularly affected by both economic development and land use planning policies, especially in the urban areas. This has been most profound in the areas of housing and infra-structure. Planning policy measures affecting the construction industry include the 1950 Capital City Construction Act, the National Capital Region Development Act, 1956, and the Promotion of Industrial Relocation Act, 1972. The formation of the New Towns Development Corporation in 1975 in the aftermath of the adoption of the growth pole strategy at the national and metropolitan level, put an impetus on the construction of New Towns. Another public agency participating in the construction industry is the Japan Housing Corporation which, prior to 1975, had been responsible for the construction of 27 New Towns. In 1981, however, another newly created agency called "Japan Housing and Urban Corporation" replaced the New Towns Development Corporation and Japan Housing Corporation. Japan Regional Development Corporation, as implied by name is active in the promotion and construction of New Towns (OECD 1986, p43). As early as 1970, the idea of constructing a research city surfaced in the form of the Tsukuba Academic City Construction Act of 1970, which, with a population of 142,000 in 1984, acted as the location for Expo 86, and as a result has attracted international attention (Nakai 1988).

Amongst other planning tools introduced by the government for the improvement of the urban areas, mention can be made of the 1954 Land Readjustment Act. This planning instrument has proved an effective means of financing and implementing urban

Table 8.2. Total Trend of Production and Chronicle of the Construction Industry

Period	Year	Major Events and Projects
a	1962	Start of Combinet construction and new industries
	1963	Building boom, Kurobe Dam No.4
b	1964	Tokyo Olympic Games, start of new Trunk Railway System (Shinkansen) Mishin Highway, Cost-down Zero-defects movement
c	1967	New National Synthesized Development Plan
	1968	Kasumigaseki Building
d	1970	Osaka International Expo, introduction of supervising system by big general contracting firms, serious labour shortage
	1971	start of Seikan tunnel works, drastic revision of Construation Contracts Law, Housing industry boom, Licensing syatem for contractors
e	1972	End of Vietnam War, Japan Archipelago Remodelling boom, real estate speculation
f	1973	First Oil crisis, adoption of :slide system" to main materials
	1974	National Land Utilization Plan
	1975	Okinawa Ocean exposition, start of Construction Industry Promotion Fund
	1976	Law Concerning the Improvement of Employmnet of Construction Workers
g	1977	Third National Synthesized Development Plan
	1978	Sunshine 60 Building, start of bridges works, (Honshu-Shikoku)
	1979	New Socio-economic 7-year National Plan, Daishimizu tunnel, start of Modernaization Model Plan for Construction Industry, Total Quality Control Movement, second oil crisis.

Source: Tomoya Kaikuka, "Constructuion Industry" 1980, cited in Hippoh (1984)

improvement projects (Fujimori 1988 p64). As government investment in the provision of such services in the urban areas has diminished more and more, prefectural, municipal and local governments are adopting the land readjustment technique where urban farm land as the only source of urban residential land is parcelled and developed (Hebbert 1986). The MOC and Japan Housing and Urban Development Corporation are actors involved in the land development process. The corporation is active in the main metropolitan areas with the aim of developing sites for the construction of houses for rent or sale. The private construction companies are also involved in this type of development. The Five Year Housing Programmes put forward by the the JHUDC for the periods of 1971/75, 1976/80 and 1981/85 have set targets for newly constructed houses of, respectively, 9.6, 8.6, and 7.7 million. In Japan 6% of the GDP is spent on housing, a much higher proportion than in other OECD countries (OECD 1986, p64). Part of this is due to the high land price in urban areas of Japan. Figures 8.7 and 8.8 show good quality housing in residential areas of Eifuku.

Kirwan (1987), identified two problems dominating urban policy in Japan: the high price of housing, and the high price of land for housing and other forms of urban development. According to the Japan Real Estate Institute the price of land in six large cities increased by around 30 per cent between 1983 and 1987. Most large companies tend to hold land in reserve both for speculative development and also as one way of getting tax exemption (Capital gains tax) for particular developments before such loopholes were closed (The Economist, 1988). An example of this is the diversification of business activities of NKK, a steel and ship building company, which is currently involved in the Tokyo Bay Development, using much of the land that it had previously purchased. Such development is attracting government subsidies rather similar to that of the Docklands Development in the U.K.

Various planning policies in Japan have been influenced by both political and geographical presuures. The same factors have also had an impact on the construction industry. For example mention can be made of the natural disasters which affect Japan such as earthquakes, flooding and the effects of the Second World War.

The discussion on the urban construction process has revealed an interesting connection between planning and construction.

Fig. 8.7



A typical residential neighbourhood in Eifuku. In Japan all residential and commercial buildings are designed to resist seismic activity.

Fig. 8.8



A small Children's park in a neighbourhood in residential area of Eluku.

A small Children's park in a neighbourhood in residential area of Eluku.

This clearly illustrates how effective planning policies can be adopted to induce the improvement of the urban aress through the participation of the government, the private sector and the people. Amongst the planning techniques which have been identified, the Land Readjustment Technique was introduced as the most effective planning tools for financing urban housing and infrastructure. The next section provides a detailed account of the mechanism of this innovative planning tool.

8:4.2 The Mechanism of the Land Readjustment Technique

> "Land readjustment is a technique by which public facilities in a certain area such as roads, parks and sewerage that are necessary for life, are created and/or improved, and individual sites are made easier to use and their site utility is increased by dividing them into more regular shapes". (Nagoya City Planning Bureau, 1982 cited in Masser, 1987)

The land readjustment technique (Kukaku-seiri) is a process of land development in the urban centres. This process involves the development of "raw" land directly by landowners without involving any speculative intermediaries. Thus land readjustment is a process by which fragmented and irregular agricultural land holdings are rearranged and changed into serviced regular building plots by exchange of land between the land owners involved (Diagram 8.5). This process is called "kanchi" (Hebbert et al 1988, p22). During the 1970s, land readjustment projects averaged 35 hectars in size; fifty percent of these were initiated by the private sector and another fifty percent were promoted by the public sector agencies including prefectures, municipalities and public corporations. The origins of the technique go back to 19th Century German rural land use which was adopted in the Arable Land Consolidation Act of 1899 and further reinforced by the Land Readjustment act of 1954 (OECD 1986, p56). It has been suggested by some scholars (Pizor 1986), that there are similarities between the LRT and the American concept of TDR (Transfer of Development Right Program). It should be noted that the TDR aims at large scale farm land development and not readjustment. The methods of compensation also differs between the two techniques (Fujimori 1988, p4).

The Government provides subsidies for the preparation and implementation of such projects through the road improvement budget of the MOC. It is particularly attractive for local governments because it offers considerable public savings in the supply of infrastructure and services. It has provided a good basis for public and private co-operation in urban development. Land readjustment can be initiated in two ways. One method involves a group of land owners who form a "Land Readjustment Association" to carry out the project (Diagram 8.5). The other method involves public bodies such as local government and the Japan Housing and Urban Development Corporation in designated areas (Hebbert et al, 1988, p22). These types of projects are of different sizes both small and large.

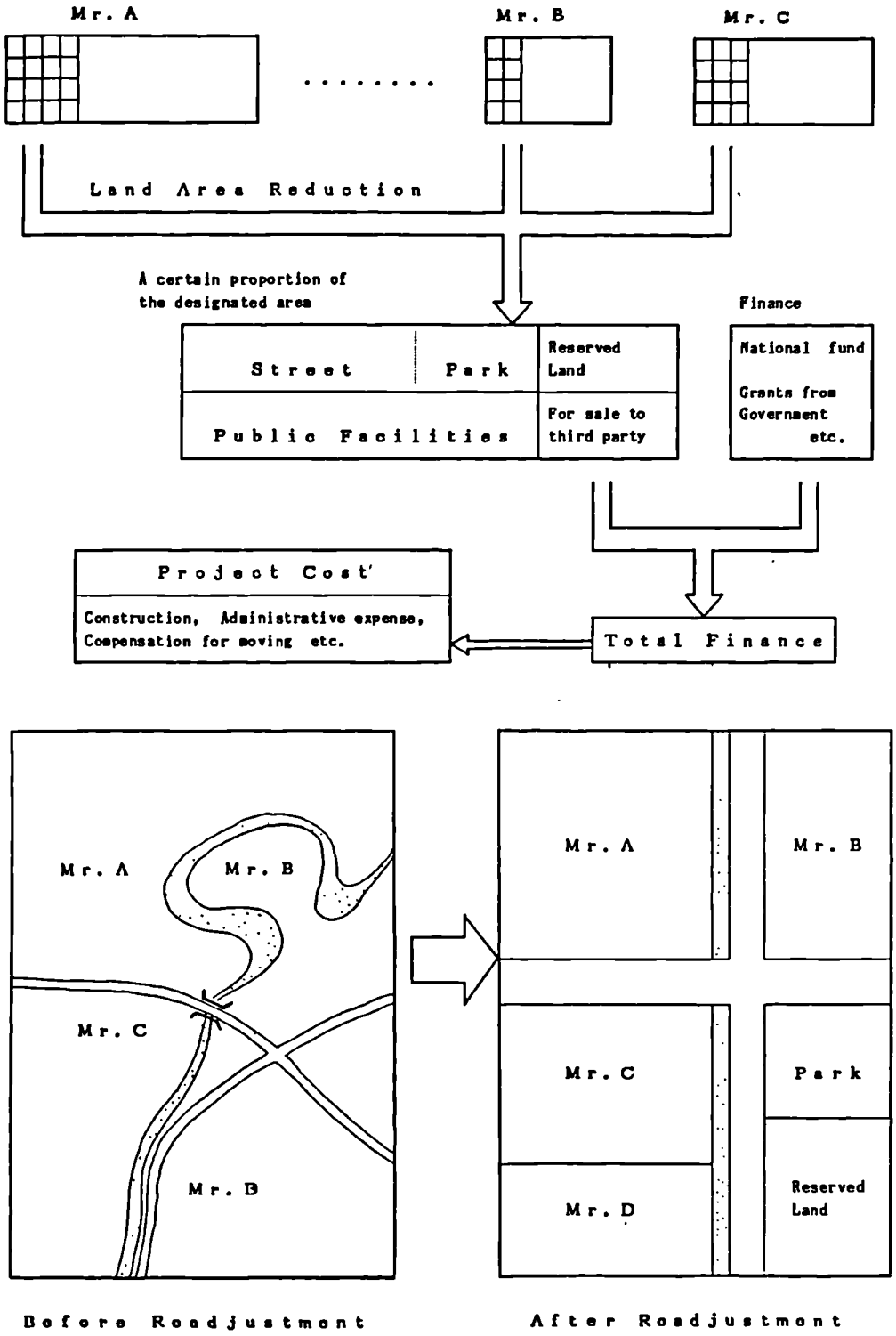
The Yokohama scheme, of Kohoko New Town, involved 1300 hectares of land and 7200 land owners (OECD 1986, p58). In the Kohoku project, emphasis was placed on the role of public participation in the form of community development. This was made possible with the formation of a committee which consisted of the Urban Development Corporation, the City Government and the local residents. The committee was charged with the responsibility for design, construction and implementation of the project. Various sub-committees have the task of informing the residents of all the decisions and inquiries.

This type of development scheme takes a considerable time to be implemented, an indication of this is given by the fact that the negotiations for the Kohoku project commenced in 1966, but the actual construction started in 1973, and has continued until 1987 (Diagram 8.6a). Diagrams 8.6b and 8.6c show the Master Plan of MM21 Project. The delay in the implementation of such a project is due to the complex nature of decision making. As Fujimori (1988) notes;

> "There are some disadvantages in this method. The project schedule tends to be lengthy because of complicated decision making. There are additional conflicts between the original residents and new residents. However, the project should be considered as a success in which public participation has lasted for more than 20 years".(p34)

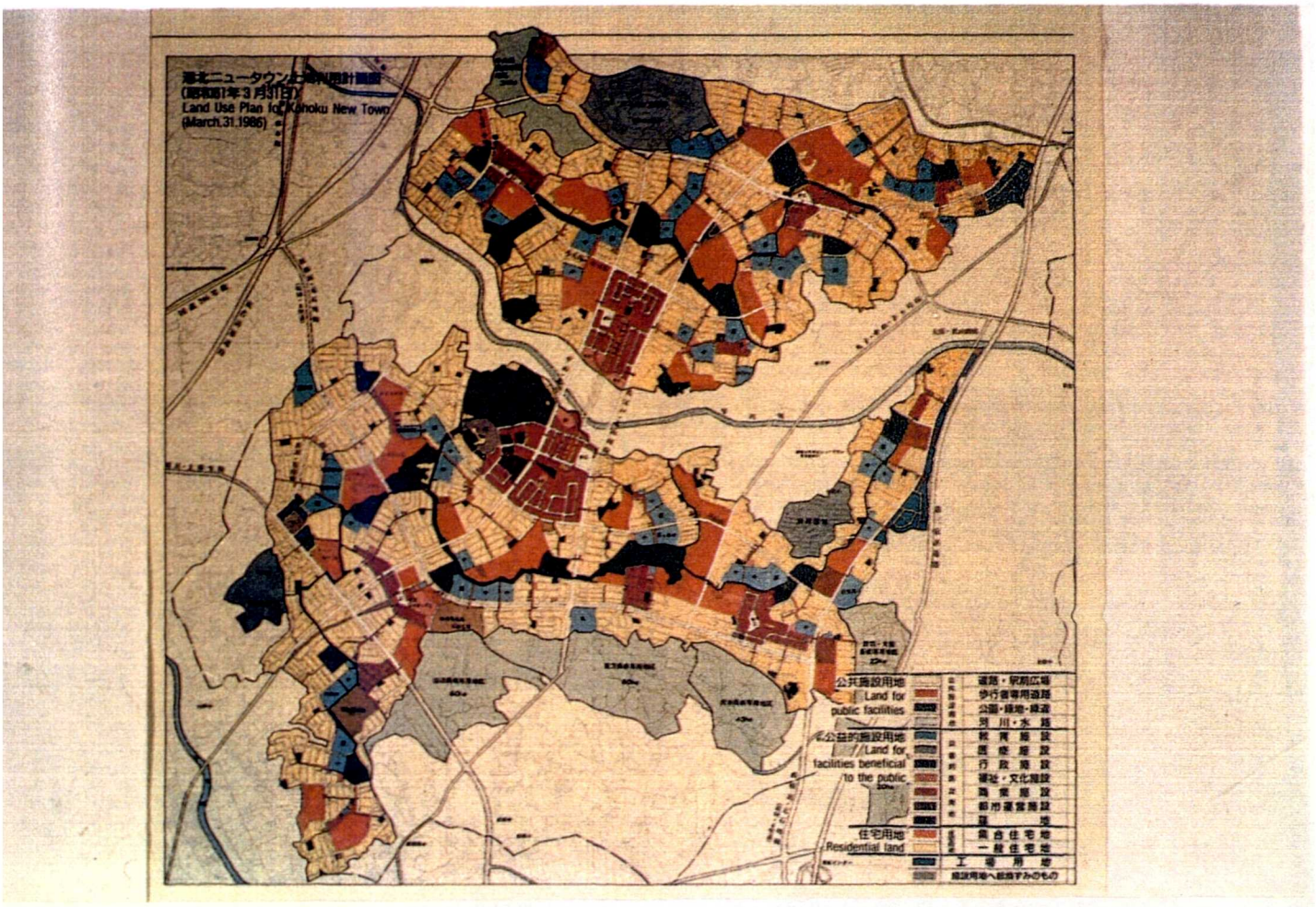
There is, however, a tendency for most such projects to be located on the urban fringes because of easier and less expensive implementation methods. As surplus land is sold to finan-

Diagram 8.5: Land re-adjustment technique.



Source: Japanese Local Planning in "YOKOHAMA STYLE", by Takashi Fujimori, 1988, p64a.

Diagram 8.6a : Master Plan of Kohoku New Town



Developers: Yokohama City, Housing and Urban Development Corporation, and private enterprises

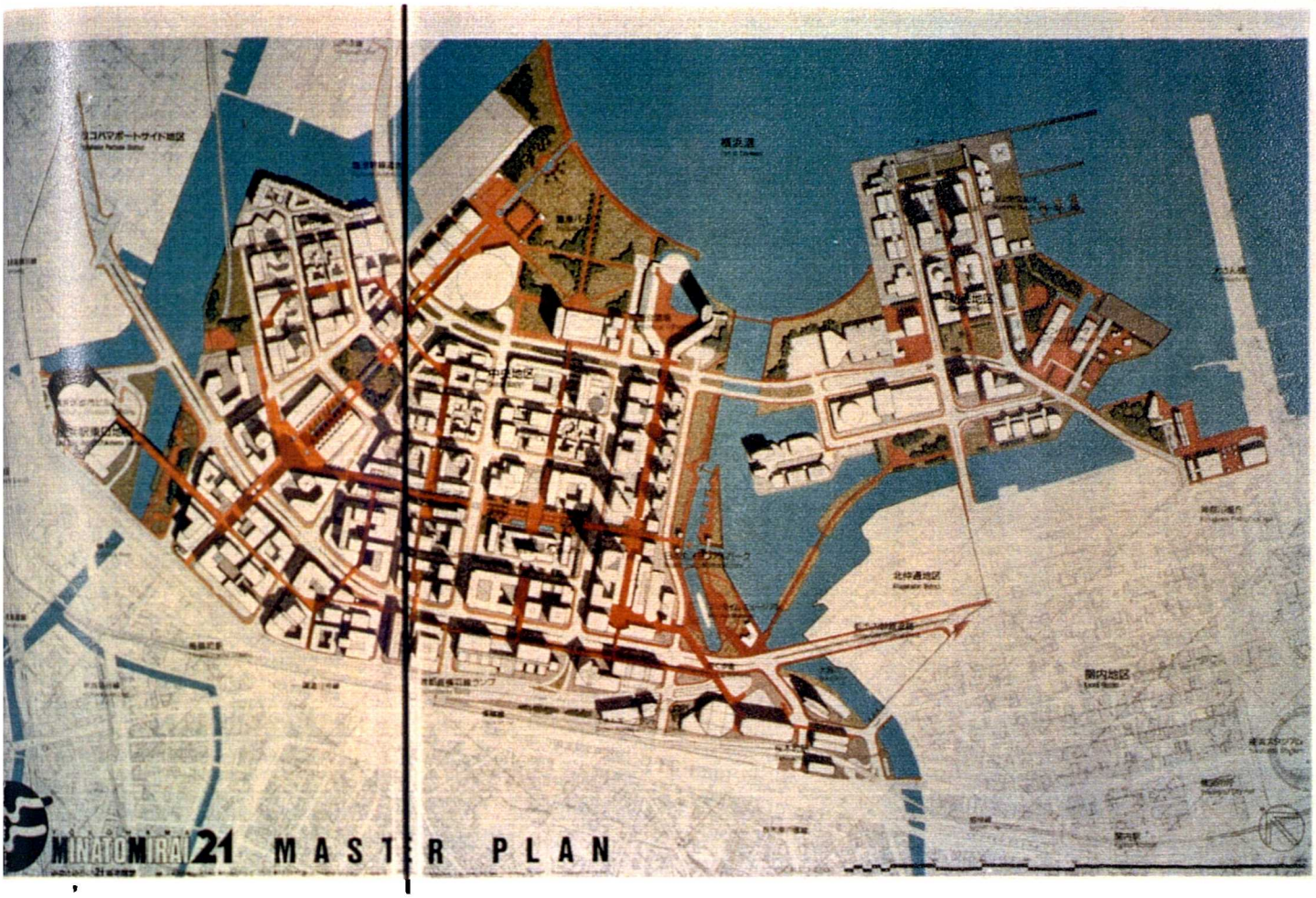
Development Method: Land readjustment project (1317 ha)
Land improvement project (230 ha)
Municipality operated housing project (67 ha)

Location: 12 km north northwest of central Yokohama, 25 km southwest of central Tokyo

Administrative Area: Kohoku and Midori Wards
Planned Population: 300,000
Development Area: 2,530 ha

Source: Yokohama Housing report 1987, p102, published by Bureau of housing and Architecture, the City of Yokohama.

Diagram 8.6b: Master Plan of Minato Mirai 21.

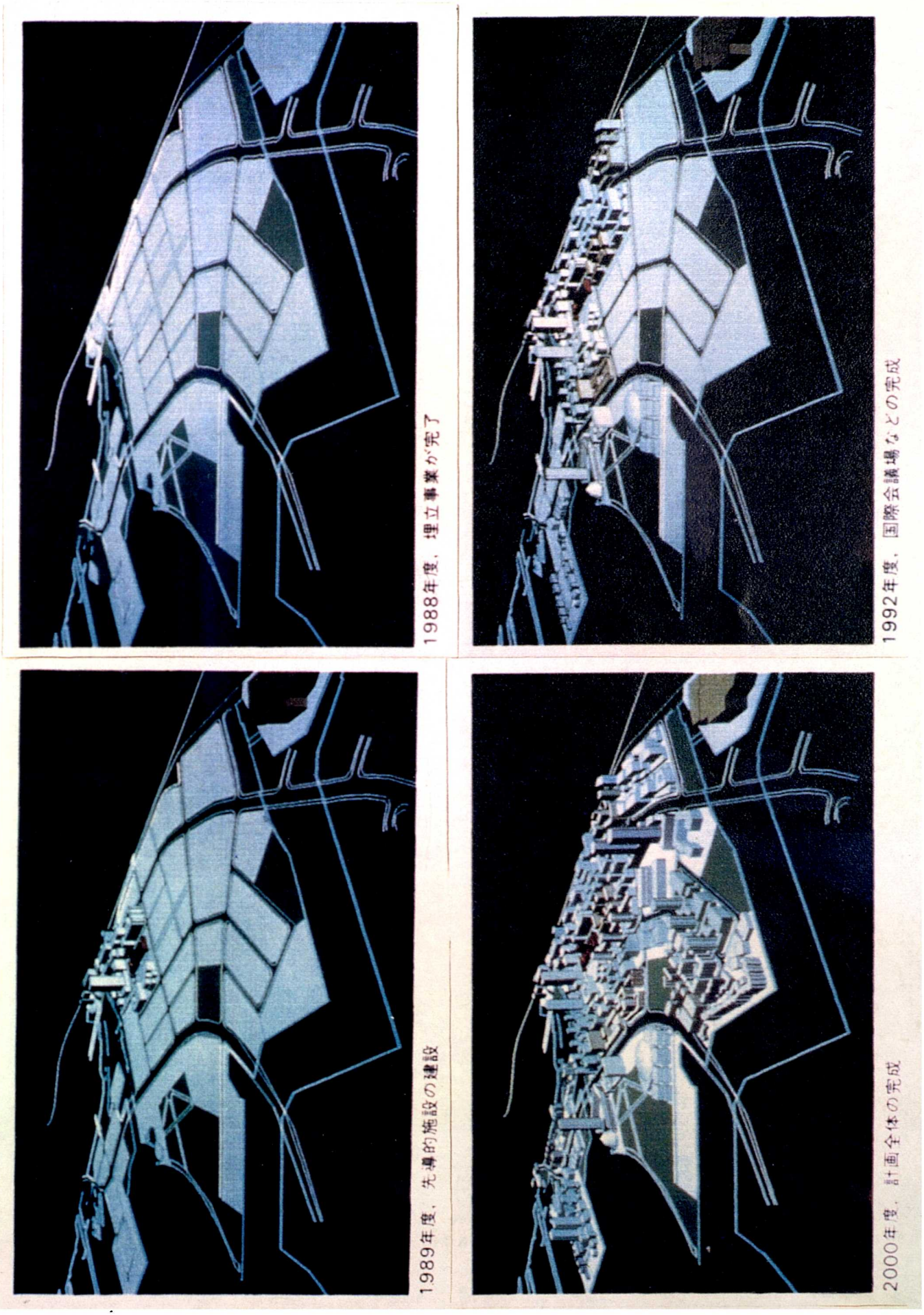


Minato Mirai 21 project was part of the NLA 1985 programme of "Plan to Restructure the Capital Region". One of the "Six Big" projects, it intended to disperse business functions thus reducing the concentration of government and private sector agencies in the Tokyo metropolis. The MM21 project aims to connect the Yokohama station area with Kannai are and to create a business core area.

Project Area: 186 ha (commercial & residential buildings 87 ha, Roads & Railways 42ha, parks 46ha and 11ha for wharfs).
Population: 10,000 residents and 190,000 workforce.
Main co-ordinating Body: Yokohama City
Main Developers: Third Sector (Public & Private sector finance)
Implemetation Agency: MM21 Corporation
Method: Land readjustment and Land reclamation
Start Date: 1983 Completion Date: 2000

Source: Newton, Graphic Science Magazine, Vol.8, No.2, Feb 1988, pp26-27. Yokohama Housing Report 1987, p128. Takashi Fujimori, 1988, pp41-45.

Diagram 8.6c: Phased Development of Minato Mirai 21 Project

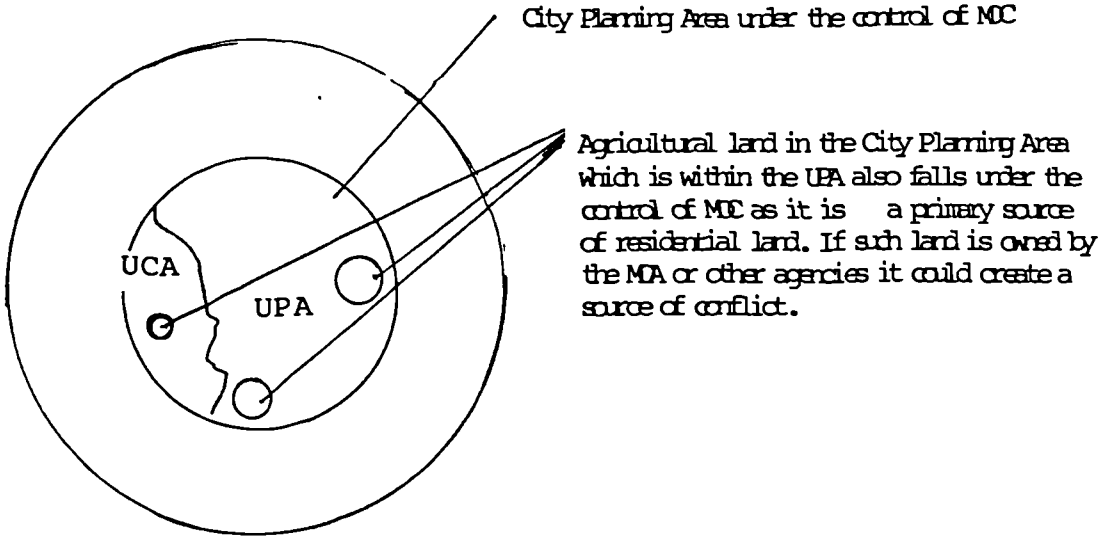


Source: Newton, Vol.8, No.2, February 1988.

ce the infrastructural and service requirements on urban fringes, less subsidies are required. This has an adverse effect by encouraging the spread of urban development. In fact this situation was brought about in the early 1970s through a process of pressure on and financial incentives for politicians. Businesses wanted them to draw the boundaries of Urban Promotion Areas in a way that their land would be located within such and thus attract high land prices during that period of land and property speculation (personal discussions). What happened was that UPAs were large and thus large amount of agricultural land is located within them. It is this land which is being parcelled and sold to consumers as the only source of land for residential development. The land readjustment technique is used to service such land within the urban areas.

Diagram 8.7 presents the sphere of control of MOC and Ministry of Agriculture. The Ministry of Construction is responsible for all land development within the urban areas and the UCAs. One source of conflict between the MOC and Ministry of Agriculture is the agricultural land which is within the designated UPAs.

Diagram 8.7. The relationship of UPA and UCA and sphere of control of MOC and Ministry of Agriculture.



Source: Drawn by author in consultation with Ohara, 1989.

For projects in the existing built up areas another method is adopted. This is based on the participation of owners, involving the title conversion system, and uses land more intensively. In the Title Conversion System (TCS), each owner or title holder is entitled to co-ownership of the reallocated land. It involves a cooperative construction of blocks which entitles the owners to a pro-rata share of the floor space after demolition of their original buildings and higher density rebuilding (Diagram 8.8). Another similar method for urban development is the Equivalent Exchange System (EES) (Diagram 8.9), in which the agreement is between a land owner and a private company, based on tax legislation. According to the OECD report, one third of newly urbanised land in Urban Promotion Areas is covered by land readjustment projects.

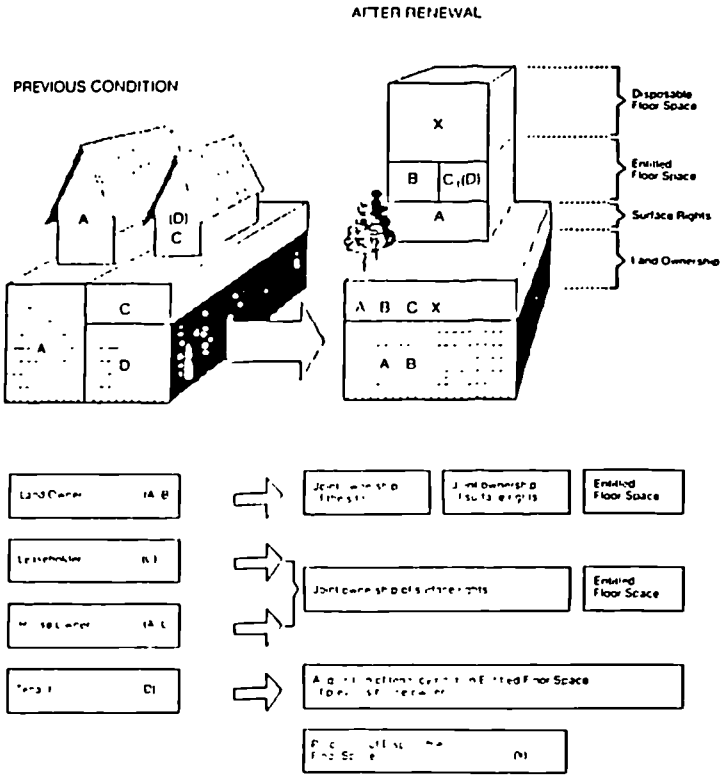
8:4.2 Japanese Method of Project Procurement

The previous sections set out the process in which planning is carried out both at the national and regional levels, the way public works programmes are initiated and some planning practices which are used to implement such projects. In this section attention will be focused on the way projects are awarded to different contractors both at the national and local levels and methods of contract management and control.

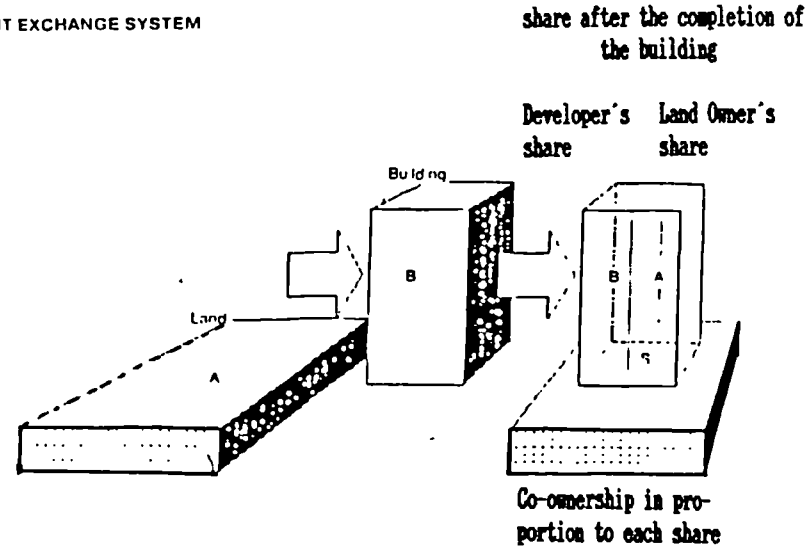
Diagram 8.10 illustrates the development system and the way development programmes and construction work is conceived, designed and then commissioned. There are three stages which are referred to as "out-put composition"/ market structure, "Contractor's Composition"/ market operators, and finally "In-Put Composition"/ industrial results on GNP. It can be seen that different projects or orders are initiated by both the public and private sectors and these orders are executed by the contractors which are classified by capital and thus their ability to carry out specific projects. In Japan there is an organised and sophisticated system of sub contracting by specialist contractors and an army of one man operators. The end products show themselves in a variety of ways and their contribution to the economy is in the form of business profits, income for employees and for corporations. The product generates income through real estate and other financial rewards. Through the usage of manufacturing products in the form of construction materials (such as steel, cement, wood products

Diagram 8.8 & 8.9: Title Conversion System and Equivalant Exchange System.

TITLE CONVERSION SYSTEM



EQUIVALENT EXCHANGE SYSTEM

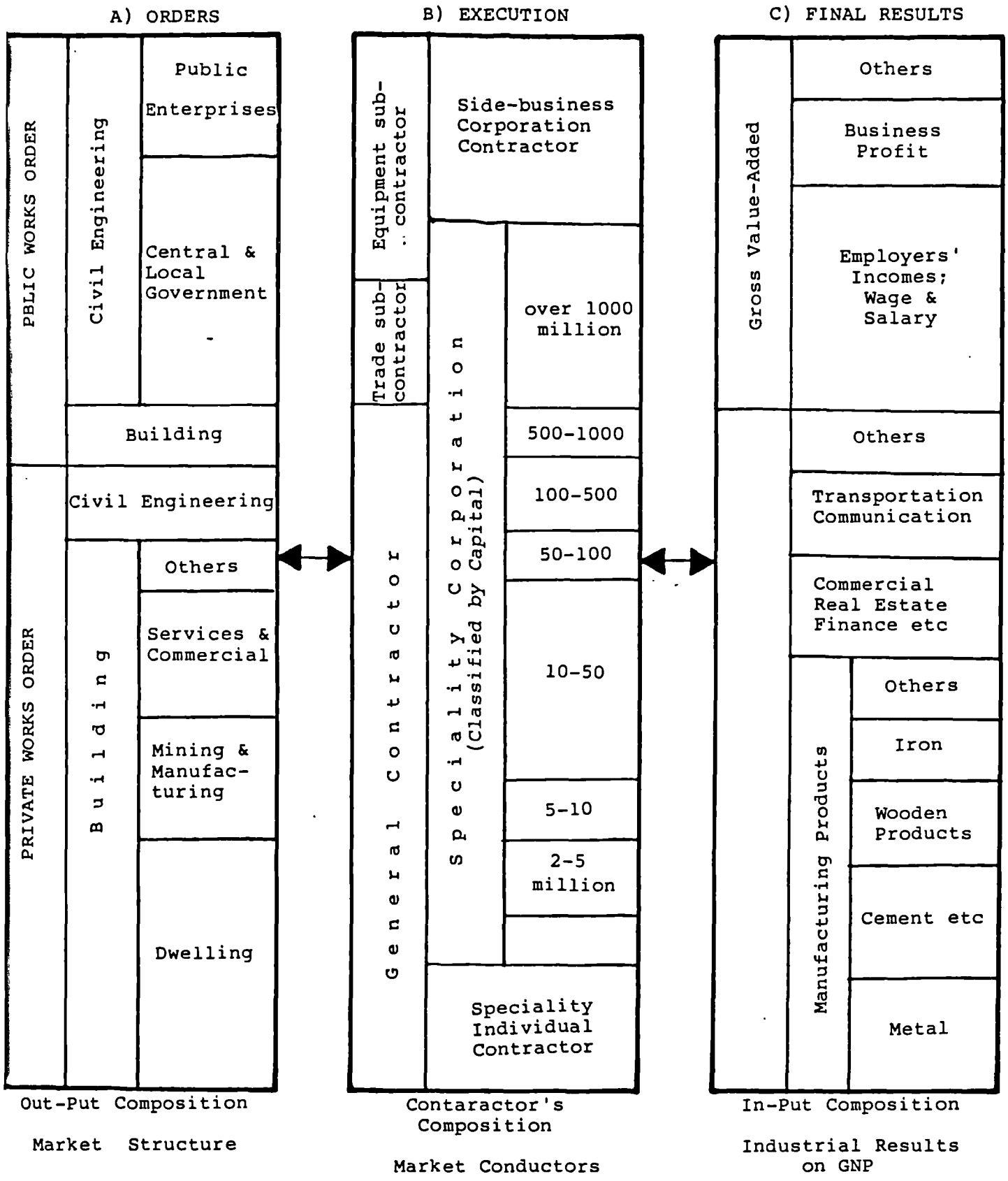


$$\text{Land Owner's share} = S * \frac{A}{A/B} \qquad \text{Developer's share} = S * \frac{B}{A/B}$$

A: Total price of land
B: Total construction cost
S: Total floor space of multi-storey apartment

Source: Urban Policies in Japan, OECD Report, 1986

Diagram 8.10. The Development System and the Stream of Construction Economy



Source: Construction Industry Promotion Fund, "Monthly Report of Construction Labour and Materials", No.76, Sept. 1981. Cited in The Construction Industry in Japan: A Survey, YasukiHippoh,Asian Productivity Organisation,Tokyo, 1984.

and others), there is a major contribution to the economy and industrial out put.

Public works in Japan are designed and executed separately by different contractors. The method of contracting is based on the Nominated Competitive Tender for about 90% of the works. In 1982 contractors were classified into 4-5 ranks, and from each rank 5-10 firms are selected as nominated competitors (Hippoh 1984, p120). Diagram 8.11 illustrates the structure of the contracting and sub-contracting system. In the previous sections, it was pointed out that there are unofficial forms of cooperation between contractors which results in profit sharing and distribution of contract work for a group of contractors at both ends of the size scale.

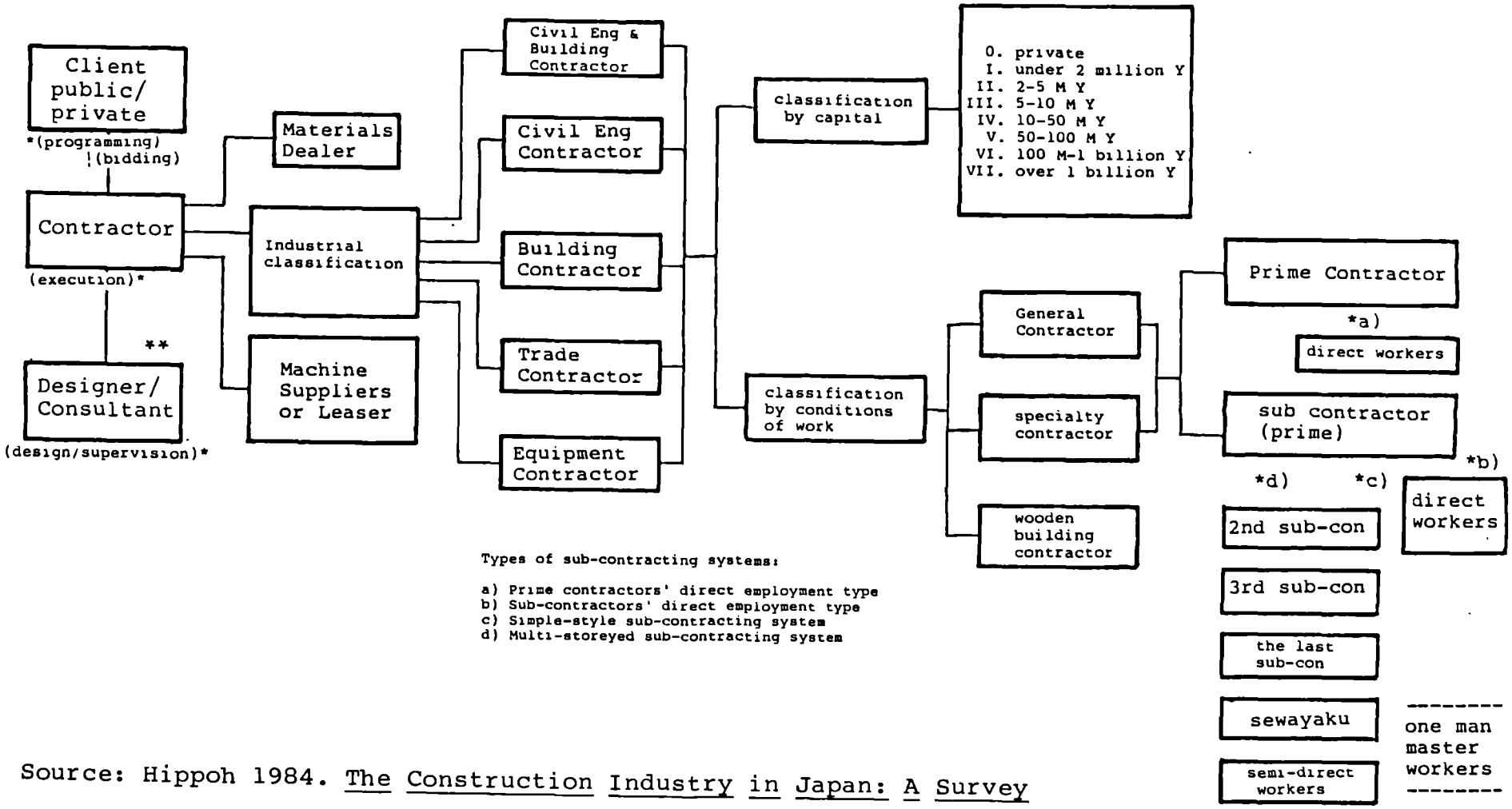
This system is called 'Dango' or collusive tendering and is prohibited by the Criminal Law. However, as it is well known and accepted; in the Japanese context what is called unofficial is official and widely practiced as a way of life (personal discussion).

It has been argued that there are different elements which contribute to the effective functioning of the Japanese planning system and the operation of the construction industry. The most prominent amongst these elements is the long term strategic planning of the construction industry. Another is the importance which is attached to the role of research in developing the industry in every aspect, both technical and managerial. The following section will pay particular attention to the role of research in the development of the construction industry in Japan.

8:5 Elements of Success in the Japanese Construction Industry: the Role of Research

Due to ignorance, the outsider's concept of the Japanese approach to technological innovation has always been said not to be "original" but rather a modification of foreign technology. Although this was probably true to some extent in the 1960s, it is no longer the case. The Japanese think long term and plan long term thus viewing research as a long term investment. On the other hand most of the western companies tend to have short term desires for products and profits and do not

Diagram 8.11. The structure of contracting and sub-contracting system in Japan.



Source: Hippoh 1984. The Construction Industry in Japan: A Survey

view long term research as economically viable. In their report for Capital and Counties on the Japanese Construction Industry The Centre of Strategic Studies at Reading University noted with regards to research:

> "Japan's approach to science and technology has changed and has moved from being a copier of ideas to a high-tech innovator. The whole nation is taking research seriously. Japan now has 317 researchers per 100,000 population, compared with 80 per 100,000 in the UK. Japanese manufacturers have realised that they need to be at the technological edge in order to ensure long term survival". (Bennett et al 1987)

8:5.1 Construction Research

One feature of the Japanese Construction industry both the public and private sector is the importance that they attach to research. Japanese companies (excluding the 27% with less than 30 employees) all possess their own research laboratories mainly because of competition: if their competitors have one then they must have one. It was in the aftermath of the Meiji (Ohara 1989) that the Japanese construction companies set out to look at the latest foreign technology in order to modify it for the post war reconstruction of Japan. Whole cities, much of the Japanese industrial plants, and the physical infrastructure were devastated as the result of intensive bombing not to mention the nuclear bombs deployed against Hiroshima and Nagasaki. The construction industry faced an immense challenge of re-building. In his report entitled "The Japanese Construction Industry Today" Professor Osamu Furukama of Kyoto University (1980) lists six areas or problems of the Japanese construction technology in which extensive R & D is concentrated, these are as follows;

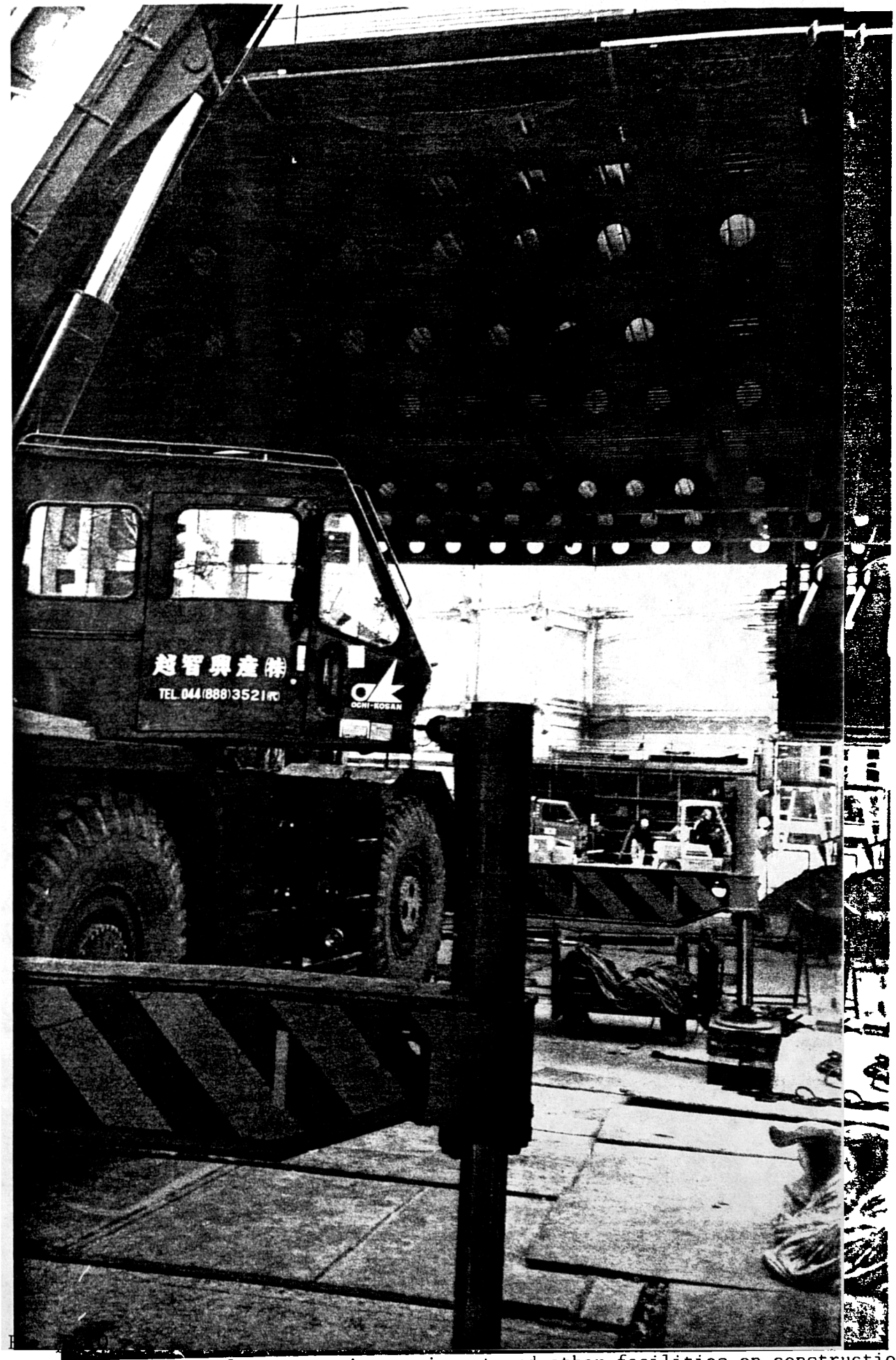
I) Earthwork and Foundations
II) Structural Dynamics
III) Industrialized Buildings
IV) Pioneering Studies
V) Computer Technology
VI) The Management Fields

However, there are other areas to which extensive research is

Fig. 8.9 .9



A typical construction site in a congested urban centre. Such construction activity in crowded city centre areas require careful site management techniques and safety measures, which the Japanese construction industry is particularly famous for.



Extensive use of construction equipment and other facilities on construction sities. Such sites often resemble a production or assembly site rather than a construction site.

devoted, including research in construction planning and high technology research, such as robotics and its application on building sites. For example the Ministry of Construction has established its own research institutes and has entered joint ventures with Central and Local government. There are numerous private research institutions in addition to all construction related technical colleges and departments of major universities and their auxiliary organisations (Bennett et al 1987). It seems that Japanese research embodies all aspects of the construction industry in the areas of materials, components, building systems, hazard reduction, construction management, methods of improving the function of local small firms, and new methods of land use planning and implementation policies, and all other related topics.

Building Research Institute was established in 1946 as the consolidated research organ of the Government in the fields of city planning and architecture. BRI's main concern is the development of construction technology and improvement of construction administration and other problems related to the scientific and engineering aspects of architecture (Hippoh 1984). The principle goals of the institute can be classified into:

a) research on protecting the cities and buildings from all type of disasters,

b) research to enable people to enjoy urban life and their dwellings,

c) research on low-cost public housing and increase of production,

d) research on construction of cities and buildings which will economise the use of materials and energy.

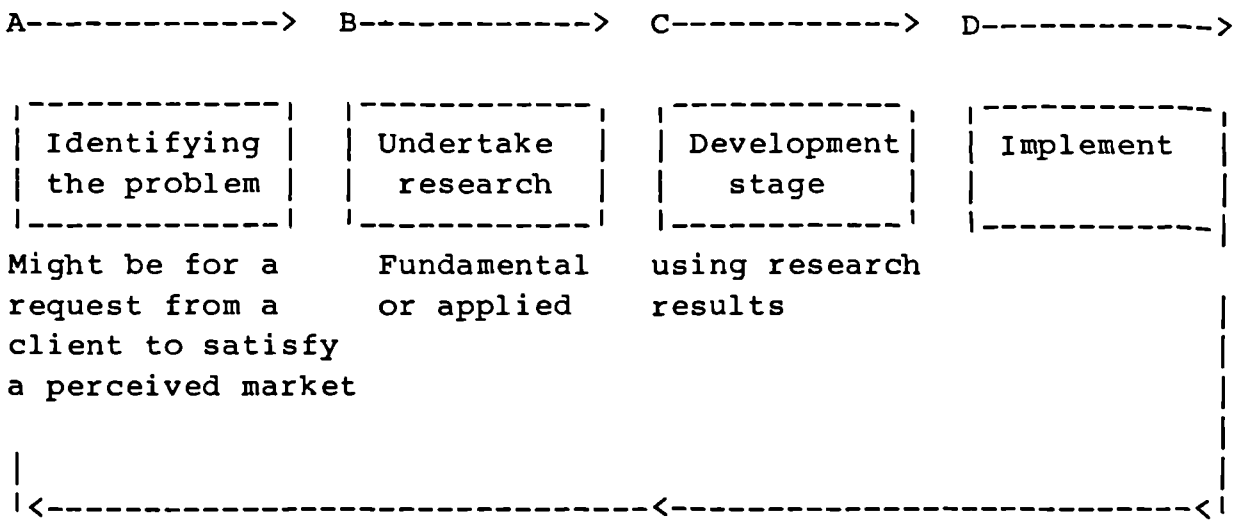
It has special concern for the needs of small contractors. By necessity, it places particular emphasis on earthquake and storm resistance for buildings (Takahashi 1986). These two engineering issues form a major part of the research activities of most research organisations in Japan. One important aspect of the work of the institute is that results obtained from research are incorporated in drafting amendments to legislations related to building regulations and city planning law.

8:5.2 Private Sector Research

Private Sector involvement with construction research is one feature which distinguishes the Japanese attitude to research from other countries. Almost all of the large private construction firms have established their own research departments. These research departments have become an integral part of construction in Japan (Bennett et al, 1987, pp 53-54). There are around fifty private sector organisations including the Big Six construction firms which maintain research departments of varying sizes employing 15 to 250-350 resear- chers with estimated annual budgets of $40 million. In 1976, private research departments employed a total of 4,400 people.

The private sector research departments are engaged in three types of work. They undertake a planned schedule of research work for the company, or they do research commissioned by both public and private sector clients on specific issues, and finally they solve problems that occur on the companies' national and international projects throughout the world. Japanese attitude towards research is best described by diagram 8.12.

Diagram 8.12. The research cycle



Based on Bennett et al 1987, p54.

Of the two types of research which were described in the early part of this chapter, i.e. the "fundamental" and "applied" (or in simpler form long-term and short-term benefit), the Japanese have gained a reputation for inception of ideas and developing them into innovation and incorporating research results into practice. These are presented in the last two phases of the research cycle in Diagram 8.12. With this strategy, the companies guarantee short term benefits in commercial terms but, with emphasis on fundamental research, they also maintain a leading role in the development of new products which will keep them ahead of their international counterparts.

This section has provided an examination of the Japanese approach and importance attached to construction research as an integral part of the construction industry. Various issues have been raised as the result of this intriguing approach. The ones which deserve special attention are the methods of dissemination of research results and application of such ideas to the actual situations. The role of R & D has been specially important in the development and modernisation of technology. Technological advancement has itself been the strategy for economic development in Japan (Sugimoto et al, 1988). Technology has also played an important role in the modernisation of the construction industry. Therefore, the following section is devoted to the issue of technology adaptation.

8:6 Technology Adaptation

Japan and the U.S.S.R are the only countries which have succeeded to base their industrial development on imported technology since the end of the First World War (Meiji). They managed to use this imported technology as a basis for the advancement of their own technological development (Stewart 1978, p133). In Stewart's view;

> "The two countries have had three things in common in their policy towards technology imports;

> Firstly, they maintained a strict control over technology imports and deliberately restricted them to particular areas where they considered the need greatest, and where they would not inhibit local development efforts.
>
> Secondly, they allowed technology imports via licensing agreements, but they did not allow the imports to be accompanied by foreign investment with majority foreign share holding.
>
> Thirdly, they adapted technology they received, and rarely introduced it unmodified". (Stewart 1978, p134-135)

Utida (1988) classifies the industrialisation of the construction technology into four major fields. These are:

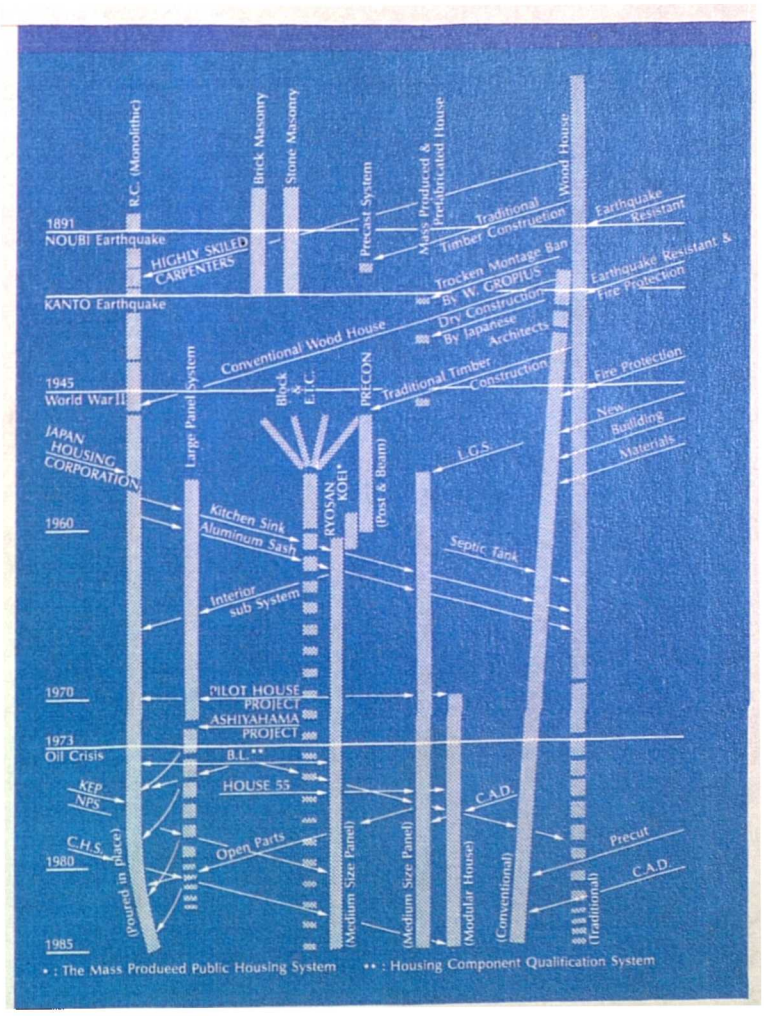
1. Curtain walls for high-rise office buildings
2. Medium-rise apartment houses
3. Mass produced prefabricated houses
4. Conventional wood houses

In order to get a more beneficial impression of the discussions relating to Technology Adaptation, attention will be focused on the application of technology in the field of housing.

8:6.1 The Adaptation and Development of Housing Technology and Production Methods

About 120 cities, including Tokyo and Osaka were partly destroyed by air raids in the Second World War (Irisawa et al 1974). Various production methods were imported in order to meet the quantitative target of housing which was achieved in the 1960s. Table 8.3 presents the chronology of the development of different construction technology and methods of production in Japan since 1891. Since the early 1970s there have been co-ordinated efforts by the MOC, MITI and the private sector to develop new modes of production and delivery in housing (Kendall 1987). The results of such intervention by both the public and private sector have been in the form of the Co-operative Housing Movement, regionalisation of housing,

Table 8.3 The Chronology of the development of different construction technology and methods of production in Japan since 1891.



内 田 祥 哉

Source: Utida Yositika, 1988. 10th Japan-France Building Colloquium: Building Production in Japan: its past, present and future. Tokyo: Building Centre of Japan.

and adaptable housing production systems (Kendall & Sewada 1987). For example Housing 55 Programme was initiated to promote Mass Produced Prefabricated Sytems. Another programme recently launched by the MOC under the title of "Operation Breakthrough for Urban Housing" is for the development of technologies for production of Support/ Infill systems in high rise and high density residential buildings. This is based on the concept of Open House as advocated by Habraken and the SAR Eindhoven. Table 8.4 illustrates the chronology of development of Open Housing Concept in Japan since its introduction in the 1970s.

process of housing has changed dramatically since the end of the Second World War mainly as the result of the rapid shift of population to urban areas. As Kendall and Sewada note, prior to World War II, settlement patterns in Japan were "predominately based on small city or rural traditions" (apart from Tokyo and Nagoya with populations of over one million). This form of settlement pattern changed rapidly to turn Japan to one of the most urbanised countries in the world. The high density urban areas produced much social strain for the population who were not accustomed to confined ways of living. This was caused by;

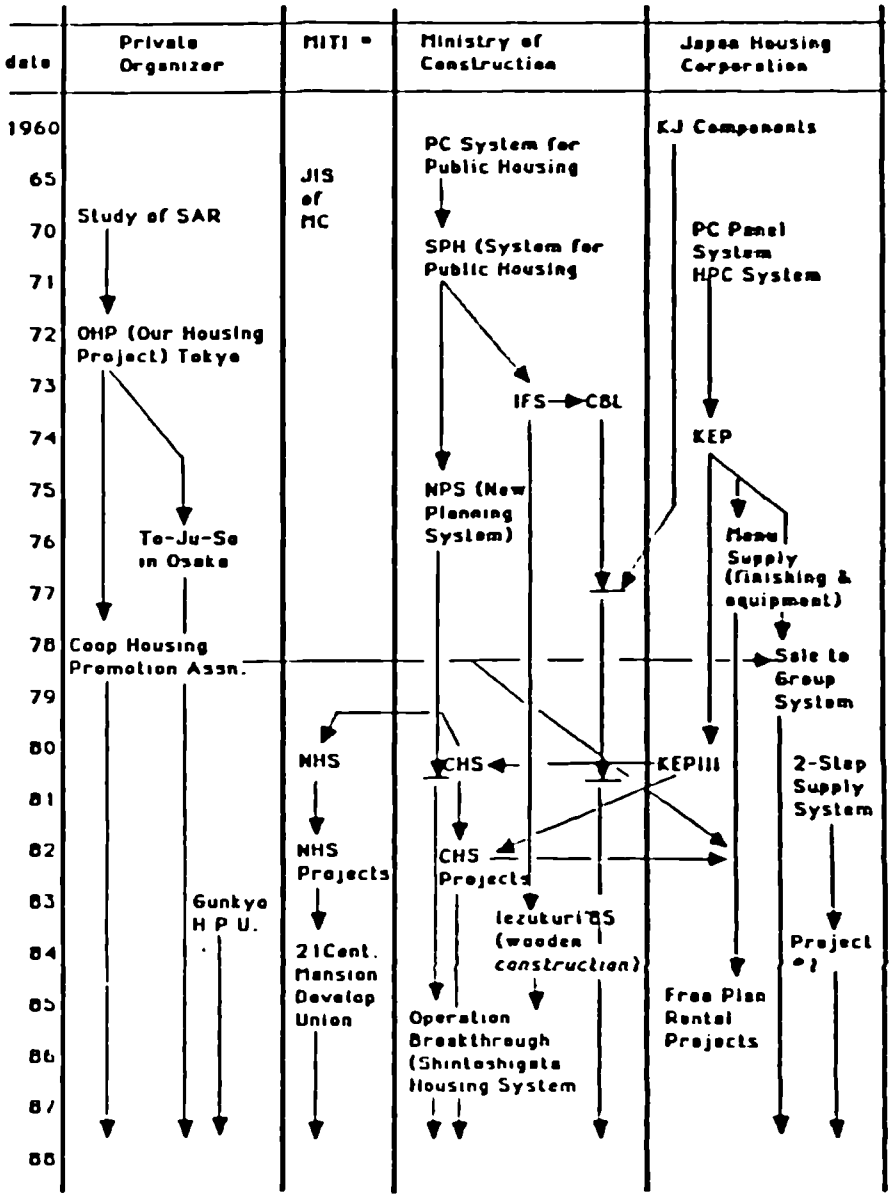
> ".....the emergence of this new housing pattern, with its associated land use, infrastructure, urban services and social changes which produced new lifestyles and new social and administrative patterns...". (Kendall & Sewada 1987, p8).

The universal application of modern technology for the production of housing to all areas of Japan had endangered the conventional technologies and local craftsmen. As Ando (1987) notes;

> "You could never think of any one persuasive reason that explains why every part of this nation should be homogeneously covered with the same technology and the same products." (Ando 1987, p47)

The development of industrialised production systems had virtually halted the construction of conventional wooden house. Once the Housing 55 programme reached its targets in the 1970s, according to Kaneko (1989);

Table 8.4 The Chronology of development of Open Housing Concept in Japan since 1970s.



Source: MITI, 1987. Cited in Open House International, Vol. 12 No.2, 1987, p10.

> "At the Building Research Institute and Japan Building Centre, we realised whilst we had succeeded in modernising the technological aspect of housing production, the conventional methods of construction had been so neglected that they were in danger of being lost for ever."

8:6.2 Regionalisation of Housing

As the consequence of this in 1980 the MOC initiated the "Promotion of the Conventional Wooden Housebuilding System" with the aim of regionalisation of housing. Japanese carpenters have always played an important role in the field of construction. The master carpenters were instrumental in the development of modern technology specially institue concrete methods. Their contribution was in the understanding and adapting the necessary formwork for R.C methods of construction. At a much earlier time, according to Minami (1986, p141) when in 1873 three students imported the technology for building the hand loom with batten apparatus from France to Nishjin, Kyoto, the local carpentres managed to build it easily. When this was fitted to the traditional hand loom it led to an increased efficiency in silk weaving.

The industrialisation of production in construction has, therefore, had a major impact on the carpenters as it converts these skilled people and subcontractors into house-builders and general contractors. As changes in construction technology reduced the need for carpentry work, there is no more demand for such sophisticated conventional skills and subsequently younger generations have turned their backs on construction (Ando 1987, p48). Ando's concern about the role of carpenters and other similar skilled labour is the impact of their work on the local or regional economy. He added:

> "Rural economies, in comparison to urban ones, are supported more by primary industries than by secondary industries, and more by secondary than tertiary industries. Since the construction industry can be counted as one of the most primitive forms in the secondary industry sector, it is quite natural to find more construction workers in rural areas." (Ando 1987, p48)

This suggests that in the rural areas the ratio of carpenters as subcontractors is higher than in urban areas. Therefore in the context of Japan, as urbanisation progresses the construction demand in the rural areas declines and so does the number of carpenters as subcontractors. Thus the proponents of the idea of regionalised housing argue that, with the decline of rural construction, there is a tendency for the unwanted local builders to be reduced to a minor role. They need help and this help should come in the form of modernisation of their skills. In the case of Japan, the research launched by the MOC addresses this issue.

The regional housing concept aims at identifying the local or regional potential (human and material resources) and finding methods of construction which can utilise such resources. In this way the conventional construction technology is both simplified and modernised. This process leads to the updating of local traditional construction technology on the one hand and the local production of materials on the other. In Ando's view;

> "... The commercialisation of housing has led to the dissolution and reorganisation of housing community. All these trends are rooted in the greater trend toward industrialisation. Commercialisation occurs not only in building materials and whole houses, but also on land and other capital which are intrinsically not productive unless they are used to produce something. Housing which used to be more public, more related to social welfare, is now being privatised, i.e industrialised. (1987, p55)

It appears that the modernisation of the construction industry has reached its climax. This has been achieved by adapting foreign technology and nurturing the modern sector of the industry based on a systematic and institutional support whilst encouraging the private sector. At the same time the experience of Japan has shown that, even in an industrially developed country, it is necessary to support small operators and to preserve the conventional methods of construction. The regional housing concept is seen as the key to the problem.

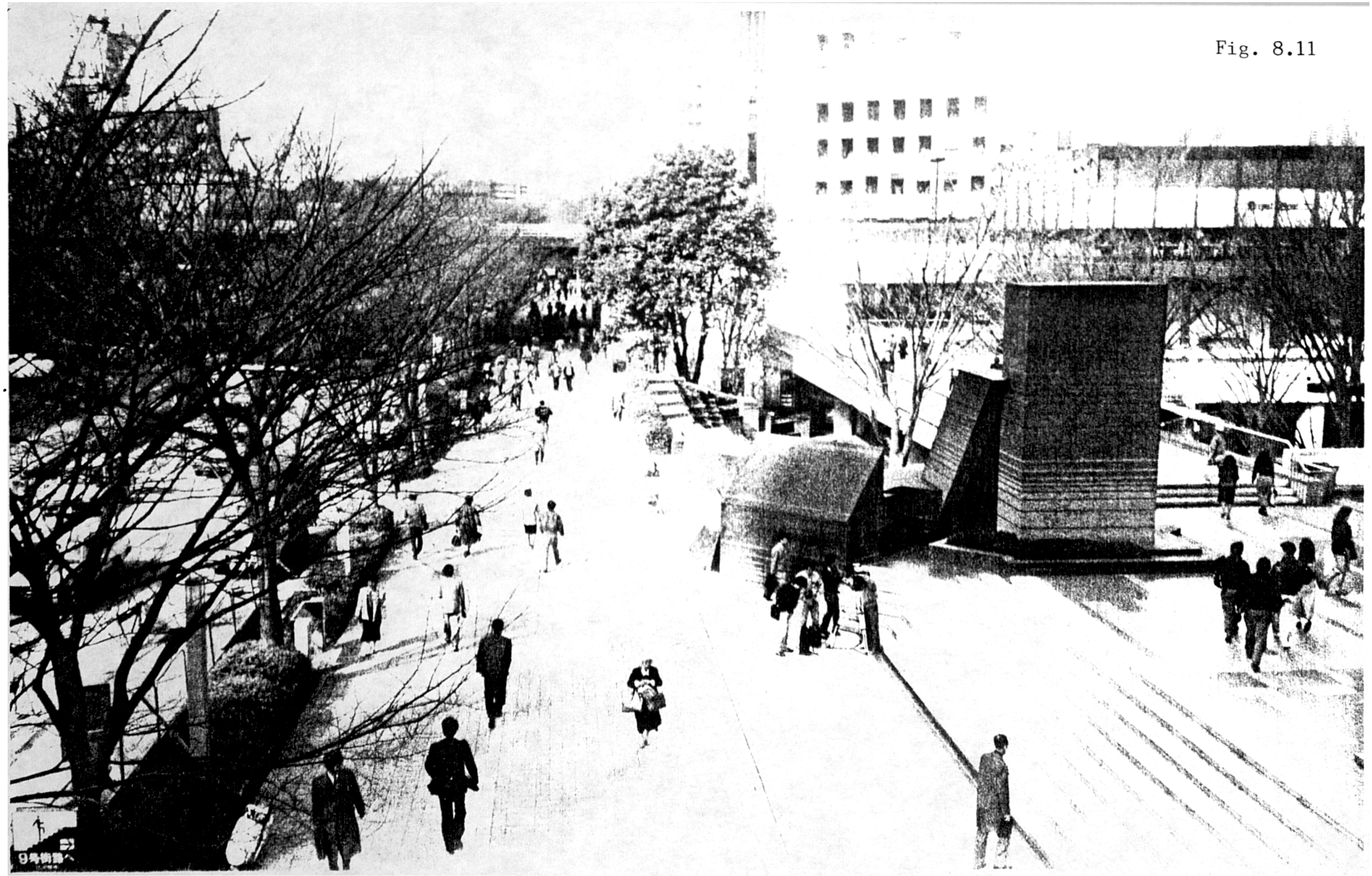
8:7 CONCLUSION

In the proceeding pages it was attempted to examine the Japanese system of planning and decision making and to determine how various policies affect the operation of the construction industry in that country. The examination revealed a sophisticated hierarchical decision making system both at the national and at the regional levels. Decision making at the national level, in the form of comprehensive national development plans, sets out objective with regard to the government's goals and the way national resources are to be used. At the regional and local levels there exists a level of autonomy which the local, municipal and prefectural governments exercise. However, this is to some extent restrained because of dependence on finance for major capital projects from the central government. The methods that have been invented or modified from planning experience from other countries include land use readjustment techniques and the zoning policy of Urbanisation Promotion Areas and Urbanisation Control Areas. Mention was also made of various approaches for financing of the development projects particularly that of infrastructure provision in the existing urban areas. These comprised a sophisticated system of participation and collaboration between the private and public sectors. Of the methods of financing development, mention was made of three ways that are currently being pursued in Japan, these included public sector financing, private sector initiated development work, and the "third sector" (i.e. public /private sector cooperation) which has been in use in Japan especially in the past four to five years (Ohara 1988).

It should be recalled that the logic for this brief examination of the Japanese planning and construction process was to see how the system of planning and the construction industry has developed particularly since the end of the Second World War. This was seen as vital especially as a base for a brief comparative study with Iran, a country which has endured some of the difficulties that Japanese society has experienced notably a devastating war and various natural disasters.

Another important reason is the fact that, as the result of the discussions put forward in chapters six and seven, it was realised that, although appropriate technology did provide a good basis for development, at the same time it was necessary

Fig. 8.11



Urban scene in Shinjuku, this area was developed by large private corporations and as the result shows the appearance of more harmonized surroundings. In new developments the planning regulation requires a minimum area of open space.

Fig. 8.12



Commercial area in Shinjuku. The use and shape of buildings in commercial zone is determined by the Capacity and Building to Land Ratio, hence the relatively uniform height of buildings.

for countries such as Iran, which enjoy from good natural resources, to develop a modern construction sector as well because of political and strategic consequences. At the same time, the Chinese experience in Chapter Seven revealed that it was vital to modernise the construction industry in order to be able to implement specialised complicated projects despite the fact that, in case of China, it has deployed the concept of appropriate industry to the full for a considerable time.

The Japanese experience also illustrates the logic behind the central concept put forward in the thesis the "Planning Construction Interaction" (PlCI), the way planning policies affect the operation of the construction industry. The Japanese experience has vividly explained this notion, it has been shown how different planning policies affect the construction industry. It has also been shown that different policies have been adopted as planning tools in order to create a constant flow of work for the construction industry in order to protect it from rapid fluctuation of demand. By examining the construction industry itself, it was determined how effective government intervention can help develop the basis of the industry, through education, assisting and promotion of small companies, soft loans and a comprehensive method of project procurement and contract management.

The interesting part of the Japanese planning system was shown to be that of studying and adapting western planning concepts. The same situation exists in Iran and China, and is an area in which the former countries can learn from the Japanese experience. But at present the Japanese planners have at last managed to pull away from western concept of a planning system and, as a result, contemporary Japanese planners are developing a new idea for planning human settlements. This is called konju-ka, which means to create rural-urban mixed settelements where urban dwellers live in harmony with agricultural activities. As Nakai (1988) notes;

> "konju-ka is a departure from the previous, mainly British inspired, planning concept which has proved less effective in Japan because of the existence of distinctively Japanese urban politics".

Further support for such confidence in Japanese planning can be found by observers. In 1988 Japanese planners celebrated 100 years of city planning in Tokyo. As the result of his

Fig. 8.13



Urban scene, Maranouchi.

study of Japanese planning system Cherry (1989) noted:

> "The conventional western impression of Japanese cities being over crowded metropolis and mismanaged environment is not real. In fact you notice a measure of confidence and certainty in Japanese planning. An example of this is the improvement of the central area of Tokyo that is the achievement of Japanese planners."

Figures (8.11, 8.12 and 8.13) show the quality of the central districts of Tokyo inluding Shinjuku and Maranouchi.

But what are the consequences of these discussions for Iran? In Iran, due to the diversity of the type of education that planners and others in charge of development planning receive (mainly in different western countries), there is a disparity between the ideas that each of these officials have about development. As a result, different policies have been adapted from different countries without full consideration of political, institutional, ideological, cultural and economic characteristics of such policies and their consequences in the Iranian society. In order to illustrate the findings of the study, the next chapter presents the general conclusions and recommendations of the thesis.

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CHAPTER 9

9:1 Re-examination of the Hypotheses

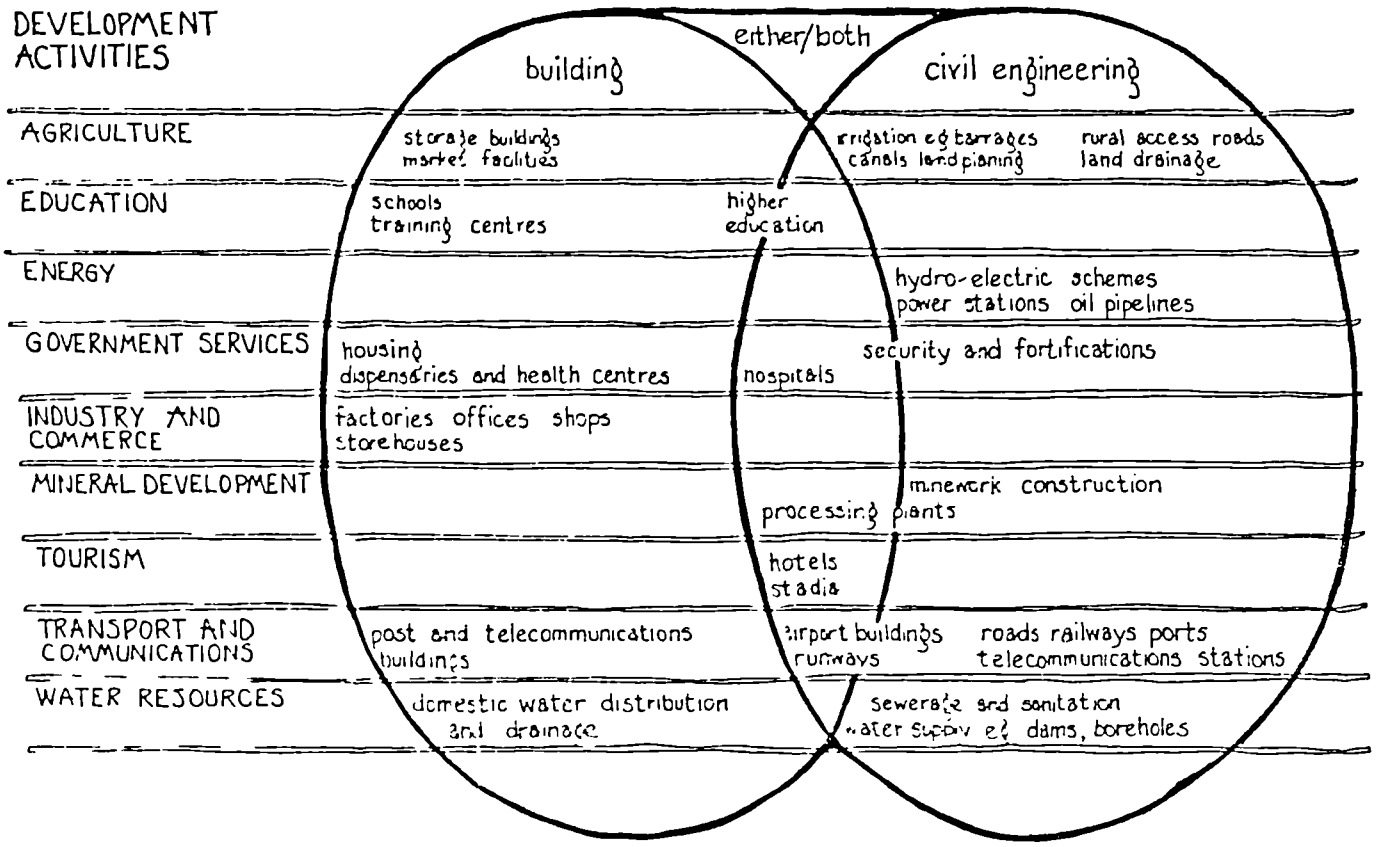
In Chapter One three hypotheses were postulated to direct and focus the research on Planning Construction Interactions (Pl.C.I).

The first was that development plans at national and regional levels are formulated without proper consideration of the ability of the indigenous construction industry to meet development demand. In this context the timing of investment allocation and spatial distribution of development schemes could endanger the implementation and outcome of the development plans. The second hypothesis asserted that planning policies strongly influence the choice of construction technology and resources. It argued that development strategies directly or indirectly affect the development of the construction industry. Finally the third hypothesis stated that national development planning and physical development planning have a direct impact on the performance of the construction industry.

Major sectoral activities in national economies depend on several different forms of construction output to be able to function properly. The majority of this output is newly commissioned work in the form of buildings and physical infrastructure, capital assets owned publicly or privately. Austen et al (1984) in their study of the construction industry estimate the share of construction in gross fixed capital formation (GFCF) at about 50 per cent in the industrialised and higher figures in developing countries. As to the role of construction in national development they argue;

> 'It is this role of the industry more than any other that has led to its characteristics as an economic driving force - a fuel to growth and development - by providing some of the essential means of production, trade, personal and social services in other sectors of national economies.' (Austen et al, 1984, pV)

Figure 9.1 illustrates the construction output required by major economic sectors.



Source: A.D Austen and R.h Neale (eds): Managing Construction (Geneva ILO, 1984, pV). Cited in 'Guide-lines for the Development of Small-scale Construction Enterprises, ILO 1987, pp15.

The adoption of any given development strategy will have a direct impact on the location of projects, the technology employed, and resources utilised. Governments influence the location of sector investment through the distribution of public funds and power between national and sub-national levels of government; through changes made to the transportation and communication networks and other forms of infrastructure. These affect the flow of goods and information such as electricity, water and gas supply, energy pipelines, flood-

control and irrigation infrastructure, through the nature, level and spatial distribution of public services.

Regional planning in Iran, based on the experience of Comprehensive River Basin Development and the T.V.A, resulted in major irrigation and agro-business developments in the south west of the country. This was part of a strategy to boost agriculture in Khouzistan region. In this case construction of access roads, a regional airport, ports and harbours boosted the internal distribution and export of agricultural produce. Establishment of factories and workshops facilitated the repair of agricultural equipment whilst government offices provided commercial services to agriculture. Further the construction of water supply system for irrigation, hydroelectric power generation contributing to the national grid system and finally housing for the agricultural workers were part of a comprehensive regional planning policy.

As far as the first hypothesis is concerned, the analysis of the development planning policies in Algeria, Nigeria, and Iran verified how failure to assess construction resources resulted in the partial failure of the development programmes in these countries. The failure of many internationally famous programmes, including the Socialist Villages Programme in Algeria, Nigeria's New Capital at Abuja, the crash of "the Crash Housing Programme" in Iran, Operation Breakthrough in the USA, Housing 55 in Japan and the Post War Housing Programmes in Britain clearly illustrated the over-emphasis on modern construction technology and resources.

As the literature on the construction industry indicates, maintained growth rates in developed countries have been partially dependent on the construction industry. Whilst it is difficult for the developing nations to attain viable means for implementing their development programmes, the experience of countries such as China has demonstrated how rational utilisation of internal resources and modification of indigenous technologies expedite development. What has facilitated this positive development has been the recognition of the importance of the construction sector in economic development. Rational decisions both about investment decisions and spatial distribution of developments allowed the efficient organisation and management of this sector.

The failure of the construction industry in many developing countries is because of the fragmentation of the industry and its composition of various components and sub-sectors. Furthermore, in the case of Iran, it was found that there was hardly any mechanism to coordinate the different activities of these sub-sectors and obtain benefits that could be derived from having a policy for development of the construction industry. There is neither a programme which seeks to meet the requirements for resource inputs in an integrated manner nor a strategy for managing available supply capacity of the construction sector parallel with the demands placed on the industry.

The construction industry in most countries is highly susceptible to government policy. This is the consequence of government monopoly over expenditure and investment in development projects in most countries. The importance of a nationally evolved construction industry has been realised by international agencies concerned with development in the Third World. However it is not only the poor countries in the Third World that are having difficulties in meeting the task of development. Even in those countries which have the financial resources at their disposal experience has manifested that, although foreign expertise can be purchased in the short term, "development" cannot be bought.

With regards to the second hypothesis, the examination of the development planning policies in Iran and China indicates how economic and land use planning policies can influence the choice of construction technology. The overemphasis of economic development plans on industrialisation in pre and post revolution periods have largely contributed to industrialisation of the construction industry. In this case ambitious development policies advocating the use of imported technology led to the project oriented type of planning procedure. The rationale for this approach is that a few large scale projects can achieve results more quickly, thus politically being seen as more desirable. The Chinese experience, on the other hand, suggests that spatial settlement planning policies exhibit an awareness of the danger of inappropriate technology being used in the construction of new settlements.

The question of technology and what is implied by appropriate technology is an issue meriting particular attention. This study suggests that the appropriateness of particular technol-

ogy depends on its application to a particular space (location) and time (stage of development). This could be achieved by the adoption, modification and development of indigenous or foreign technology, appropriate for different space and time. Responding to an interview question about whether Habitat had adopted a particular concept of appropriate technology for the provision of shelter, Dr Ramachandran the Secretary General replied:

> 'No, I would say that there is no such thing as a single technology that we have adopted. It depends upon the country again. What we encourage is the use of local building materials. We are against the importation of building materials which are costly and that the people cannot afford. For example in Costa Rica, they use bamboo for construction because there is plenty of that. In some other country it may be cement or hollow cement blocks. In a third country it may only be mud architecture-compacting mud blocks and then building with them. They are very comfortable, cool in the summer'. (Steiner et al p102, 1990)

In order to illustrate further the emphasis on appropriateness of technology, he continues:

> 'Therefore, the technology appropriate to the country is what we recommend rather than anything which is uniform and which is just high technology for high technology's sake. We'll use high technology where it is necessary'. I give an example of what high technology we've used. Most of the cities in the developing countries do not have adequate data, for example tax collection or getting back what loans have been advanced for housing. We use micro-computers and help these city governments to maintain their whole data and to keep on top of the resources that they have for expenditure, continuously monitoring it. etc. So the technology adopted is what is required at that point of time in that particular locality in that particular country.' (Steiner et al 1990, p102)

This approach played an important part in economic development strategies of China and Japan. Differing political ideologies led to China's political, economic, social and technological isolation. Whilst political ideology dictated the notion of

self reliance, aspiration for economic development made technological modernisation based on foreign technology prerequisite. The examination of the concept of appropriate technology in Iran and China and the process of technology transfer in the three countries including Japan point to interesting indicators. The contradictory evidence from Iran demonstrates the failure of appropriate technology in that country due to a number of important factors. The most influencing factor appears to be the changes in people's aspirations especially in housing production process. Other factors include market forces and their impact on the current vogue in construction and use of materials. The choice of technology is also influenced by the image led developments by both private and public sectors.

As most changes happen within a very short period of time, very often during the life span of one generation, as in the case of Iran and Algeria, this gives rise to many conceptual conflicts between indigenous values and aspirations. These conflicts are characteristics of contemporary societies in rapid transition. Such rapid transitions are reflected in the self build housing production process as indicated by the Iranian case study. There appears to be contradictory evidence even in the Iranian context. On the one hand there is need for an alternative approach in selection and diffusion of technology, but at the same time the goal of modernisation and closing the technological gap in order to achieve technological and economical self reliance necessitates the transfer of foreign technology. As the pace of change in development accelerates in the industrialised societies, the technological edge widens accordingly. This factor alone gives rise to debates as to whether industrialised development strategies in some developing countries are the correct option for development.

Of course there is a conflict between self reliance and modernisation. In effect people's values and society attitudes are not static but evolve and change with time and cross cultural influences are as old as recorded history. They are even stronger now that development in communication technology and technological dependency have made interactions between all parts of the world not only possible but unavoidable. Living in complete isolation is increasingly difficult if not impossible. The experience of China between 1960s and 1970s and Iran in the 1980s illustrate this point.

The adoption of construction technology and its effective application to housing provision at national and sub-national levels necessitates careful consideration. Physical development planning at regional and urban levels could foster development and diffusion of technology at the settlement level. Evidence of research on housing form and design in Iran and other developing countries indicate that indigenous house form and patterns use land and building materials more effectively than the modern house plan and production systems. As Chabbi (1989) in her study of the Algerian housing and settlement pattern suggests:

> 'As far as housing is concerned, the adoption of a courtyard housing type would release three sides of the compound wall, which could be used as common or party walls. hence, houses could be built contiguously, without the need for external walls except for the facade. This means a reduction of the size of the building plot, a higher density and an exploitation of the land to its full potential, and therefore considerable economic advantages. Furthermore, since courtyard houses are built with party walls usually along three sides of their building plots, they constitute a multi-cellular structure giving mutual lateral support and also economising on building materials *and using simple* building techniques and local labour.' (Chabbi, 1989, p292-293)

Effective diffusion of imported technology could play an important role in the development and modernisation of the construction industry. At the same time the development and rationalisation of indigenous technology could be achieved by regionalisation of housing and construction technologies. Such a policy has been practised in Japan a country with a highly industrialised construction industry. The result of research carried out by the Japan Building Research Institute indicated that much of the traditional crafts and technology for rural housing was lost due to universal industrialisation of housing production. It is such experience which could be most useful for adoption by Iran. Therefore before indigenous housing is abandoned as a design concept of the past, land consuming and too expensive, they should be appraised objectively. They can then be incorporated into the design of new housing types, taking into consideration the changing needs and new aspirations as well as the prevailing environmental and economic conditions.

The third hypothesis concerned the 'ways and means' of how development planning strategies at the national level influence the construction industry. Here, the question is how an appropriate construction industry can be created for an appropriate planning strategy at the level of national economic planning and physical development planning. In this context the examination of planning and construction processes in Iran, China and Japan demonstrate different results. In the case of Iran, industrialisation policies have shaped the construction industry. The development of the construction industry in China appears to be the result of effective utilisation of manpower and material resources based on consolidation of the indigenous and imported technology. Such evidence reveals a series of government actions in support of the construction industry. In Japan government strategies include a series of economic planning and physical planning policies at national, regional and urban levels in order to maintain a constant flow of construction demand.

The innovative nature of private and public sector participation in urban development is an example. Whether it is a deliberate government policy to help the private sector or a side effect of government action in improving the urban environment, urban planning policies including land readjustment appear to play a vital role in creating a constant flow of work. Such development work is then implemented by both small and large construction firms. Other more direct government initiatives in supporting the construction industry take the form of better personnel and management training, financial incentives and administrative support at the national and regional level. Such policies are the product of many years of research carried out by both government and private institutions in finding ways of improving both policy and product related issues to strengthen and improve the operation of the construction industry.

In the light of the above analysis it is imperative to reflect upon the issues raised in this study and their relevance to the main research objectives. The principle objective of the research was to demonstrate the interaction of planning policies and construction technologies. In tackling three important subjects of planning, construction and technology in the same study there is undoubtedly some complications in firstly

conducting such a research and secondly presenting the research findings. It is recognised that each of the three subjects can form the basis of separate research on its own but, the intention of this research was to take an overall view of the relationships and connections between planning, construction and the choice of construction technologies.

Most of the research conducted on Iran or other developing countries on issues of development and the production of the built environment point to a series of factors which act as indicators of the failure or success of development strategies. In the case studies presented in this research the planning and construction processes in three countries were examined. The earlier sections highlighted the findings of each case study. In order to provide a more focused conclusion the last part of this chapter will focus on the relevance of the research findings to the present Iranian situation i.e the post war context. In this context considering that China and Japan experienced long and devastating wars it is pertinent to draw upon their experience in post war economic and physical reconstruction.

9:2 Iran: The Challenge for Development

The challenge that faces development planners in Iran is diverse and delicate. It is not only the extensive damage inflicted by a long war. The destruction caused by the war added to the already troubled process of Iranian economic development. Iran already faced a burgeoning urbanisation problem brought about as a consequence of rapidly deteriorating situation in rural areas. In this context it was illustrated that much of the ills of successive economic development planning has been due to uneven development and regional disparity. This was shown to be in terms of urban bias in the provision of both physical and social services.

Such disparity is shown to be further enhanced by the adoption of excessive industrialisation policy based on importation rather than development of home grown industry. The knock on effect of such development strategy on the construction industry is the emphasis on prefabrication and systematisation of housing and building production. Subsequently the allocation

of investment funds and spatial distribution of such development schemes due to the large initial capital outlay is dependent on government action. As a consequence an over centralised decision making process has been established thus hindering development at regional and local levels. The same pattern is evident in the physical development planning process. It has already been established that the physical planning or land use planning has been greatly influenced by the presence of expatriate consultants or foreign educated Iranian professionals. Indeed the overall administration and organisation of planning in Iran was set up by an American consultants group in the shape of the country's first development plan in its modern history.

With such background it is not surprising that the same pattern of planning procedure and practice has remained unchanged despite fundamental shift in theories of planning and development at the international level. The impact of such planning procedures on the built environment of Iran has been the partial destruction of the indigenous settlement patterns and their replacement by the international grid pattern development at the city levels. Furthermore, the substitution of much of the existing building materials and methods of construction by imported technology and materials has shifted the patterns of house building process. Such developments have not fully taken into consideration the socio-economic implications and cultural identities of a society undergoing rapid transition.

In the course of the investigation of the planning and construction processes in Iran in this research many aspects of the process have been criticised. Such criticism has been directed on the development strategies adopted so far. In concluding the study it is important to discuss what alternative options are available and indeed applicable to the development of contemporary Iranian society.

According to different observers who have studied the economic consequences of the war, the economic and physical damage is estimated to be at $200bn by 1986 (Kiyoteke Tsuji 1988) and 369bn until mid-1987 (Mofid, 1988 and 1989). Many cities, towns, and hundreds of villages together with other strategic projects such as bridges, ports, refineries and many industrial complexes are in desperate needs of reconstruction. The symptomatic nature of the present situation in Iran puts an

obvious burden on the construction industry; ie the task of reconstruction.

But how will this task be undertaken? In order to adhere to the goals of the Revolution i.e that of self sufficiency, the authorities still insist that reconstruction of the country will be carried out by Iranians i.e. people's participation. As early as 5th September, 1988, only days after the end of the war, the former Prime Minister Mousavi in his speech at the gathering of Provincial Governors stated that;

> "....in the reconstruction of war damaged areas, you must seek the participation of the people".

Whilst political support for radical participation of people in development efforts is essential, it should be noted that the setting up of such a process will require careful consideration. Participation will be vital in the post war reconstruction due to the magnitude of the destruction and the availability of limited financial resources. Iran relies heavily on her oil exports as a primary source of income for investment in development programmes. Based on the value of oil exports in 1988, some observers, estimated that the task of reconstruction could take 90 years. Due to political and economic implications, Iran cannot wait 90 years just to return to the situation prior to the out-break of the war, at least in physical terms.

Finally in this context a number of questions need to be answered. For example what has been the outcome of this study and what are its implication for the planning system and the construction industry in Iran? How can the constraints to development be overcome? The future scale of demand for construction in Iran is enormous. There is an urgent need for revitalisation of the infrastructure. There is an acute housing shortage. There are large parts of the rural areas of the country which are under-developed. Natural disasters, notably risk of earthquake damage, are ever present. Capital is scarce and there is shortage of manpower. These are some of the problems that Iranian planners and decision makers have to face.

9:3 The Post War Context

In order to address the above issues in the post war reconstruction of Iran a rethinking on the factors involved in the planning and construction processes is prerequisite. This includes a re-examination of the economic development planning and the physical development planning strategies. The organisational and administrative aspects of the planning and implementation agencies form the basis of such examination. Subsequently a series of parameters could be established to direct the development of the alternative procedures.

The set of parameters here are referred as the interaction between planning and construction processes. These have been identified in the different chapters of this study as factors influencing the planning and implementation of the development programmes at different levels. This could range from reorientation of the hierarchy of the planning system i.e the top-down or bottom-up decision making process to localised utilisation of resources and implementation. The appropriateness of bottom-up planning system has been validated as a result of numerous studies by development experts.

The relationship of urban and rural space and its consequence for national development is particularly relevant. The debates on the future role of cities i.e. centres of production and economic activity or centres of consumption give rise to conflicting views. Whilst the economic rationale for cities in the industrialised world is that through agglomeration, certain activities can be carried out more effectively and efficiently, this does not appear to apply to cities in developing countries. However the creation of such a system requires sophisticated organisation of space, i.e at local, regional and national levels. To do this it is necessary to define the role of city and its contribution to national development. The emerging organisation could be based on the dynamic process of bottom-up planning.

In the case studies presented in this research, the evidence from the three countries are contradictory. In Japan the massive urbanisation since the second world war has contributed greatly to the economic development of that country. Cities have been the major centres of production and services. On the other hand in the ideological debates over development, cities were seen as centres of consumption rather than production. In

this context the evidence presented in Chapter Seven indicates to a deliberate policy of disinvestment in physical development of cities thus inhibiting growth and preventing urbanisation. Urbanisation in China was seen to undermine national development. Thus the strategy with regards to the role and function of cities was seen in maintaining the position of cities whilst redirecting investment at rural areas of that country. In Iran however cities appear to have grown beyond control becoming the main centres of consumption and political and administrative hub of the society. The uncontrolled growth of urban centres in this case has been as a result of decline in the countryside, diminishing agriculture production and lack of basic services. This unequal relationship between the urban and rural system has undermined the economic and political development of Iran since the mid 1970s.

Thus the development strategists in Iran are caught amidst the contradictory debates over the role of the city and its contribution to economic development. This situation is not unique to Iran. At the time that all the evidence suggests the need for a balanced urban-rural system, the current vogue as advocated by the international development agencies encourages a 'laissez faire' attitude towards cities as the main centres of growth. One glance at the current literature on Third World development indicates that there is no shortage of prescriptions for policies and programmes, institutional and legal changes, that might alleviate if not transform the conditions in these societies. In tackling the development in a developing society, the character of the state and politics in the society merit special consideration.

So what is the appropriate option available to development strategist in Iran? The economic, physical, social and political conditions in Iran are different and to some extent unique. As with other developing countries, the character of state and politics have some unique features. These include firstly the State's role as the most central institution in national development and secondly the State is seen as the main institution of social and economic reproduction. The new political order draws much of its support from grass root committees in the country-side, small towns and the low-income communities in the larger urban centres. This has been achieved through the establishment of grass-root committees run on the basis of neighbourhood units which are an important component of security and political system. Providing there is

a genuine will in the part of politicians, with some modifications the same hierarchy could be used as channels for identification of priorities and mobilisation of local resources for implementation of development projects. As the Chinese evidence indicates such units are particularly effective in providing local advice and channelling social services.

In recent years there has been increased reliance on community participation or self-help in both planning and implementation of numerous development projects. This concept has been used in much of China's rural development for many years. If such a concept is nurtured in the Iranian society, its contribution to development will be particularly relevant at this stage. The decentralisation of decision making and localised development would require the transfer of know-how and resources to the areas at the bottom of the present hierarchy. This bottom-up approach is a more people centred approach, since it involves the political mobilisation of ordinary people. As Akin Aina (1990) states;

> 'It also involves a process of education (not formal but political) as to their rights, duties, and obligations towards the environment in which they live. In this context, participation is defined not only as involvement through consultation and elections, but rather as the yielding of the direct control of decision-making in urban settlements to the communities who live in them.' (p202)

It is agreed by most commentators on the post revolution Iran that major sections of the population have become politicised, therefore the potential of mobilisation at the grass roots is much enhanced. As discussed in the chapters on the Iranian planning and construction processes, in many low-income areas of cities, it has been possible to initiate a number of self help upgrading and improvement projects. This has only been possible through mobilisation of capital and material resources by the local neighbourhood councils.

In the post war reconstruction of Iran, the relationship between land, labour and capital in the context of the production of the built environment necessitate careful consideration. The economic and physical reconstruction of Iran requires particular emphasis on the exploitation of domestic resources. With the present status of world integration, it is

impossible for any country to take an isolationist attitude towards coexistence and development. However, development efforts in Iran should take full consideration of social and cultural conditions of the country. The physical reconstruction of the many settlements in the post war period has brought about an opportunity for the improvement of the physical fabric of urban and rural areas. It is imperative for the reconstruction plans to be realistic. The government actions could play an important role in raising expectations by setting high standards.

The situation of the construction industry may be regarded as unique, mainly owing to the existence of a war economy and a period of economic stagnation. However, the over-optimism of many professionals involved in the construction industry, within the Government and the private sector, was evident during the survey. On many occasions it was mentioned by such professionals that most problems regarding the shortages of construction resources will be automatically resolved once the war has ended. In the two years after the end of the war, the evidence does not reveal any improvements. The shortages of many materials has worsened and the black market price of such items has increased dramatically. Such major problems will have a negative impact on the development efforts. The effective organisation of the construction industry is prerequisite to any development.

The major players in the construction industry: firstly, the government i.e the main source of investment, secondly the private sector, responsible for implementation, and finally the informal sector, a major source of small scale activity, are all dependent on each other. The relationship between the State and the construction sector in Iran is different from that prior to 1979. The previous administration encouraged the creation of a powerful private sector heavily involved in real estate development, in the post revolution era, the private sector has been viewed with suspicion. Since 1979, land and property speculation has been discouraged. This action has been justified on the basis of prevention of speculative investment as the main cause of 'economic instability' and high inflation. Undoubtedly there are conflicting views as to the role of property development and its contribution to economic development and employment generation. They point out to the pressures that illegal speculative development placed upon the economy in the 1970s.

With growing pressure on the government and its limited resources in tackling project planning and implementation, a well developed private sector can make positive contribution to the development of the construction industry. So, what measures could be taken to achieve this.

An understanding of the actors involved in the planning and construction processes is necessary. This is a vital prerequisite in evaluating the full potential of the role and contribution of the construction industry to economic and physical development of the country. These include the formal organised public and private sector and most importantly the informal sector. The other questions requiring particular attention include the ability and potential of the indigenous construction sector. In a simplified terminology that is the availability of domestic resources to convert land into buildings. This is a very sophisticated process. In this process capital, labour and equipment are the main players.

The main issues concerning land is the method of land use, conservation of land and controlled conversion of agricultural land into urban housing. Land is the most politically sensitive commodity. The issue of ownership remains an unresolved problem in many countries including Iran. The legal status of land has been subject of heated debate in the Iranian Parliament for a good part of ten years. One of the causes of acute housing shortage in the urban areas is land. Access to land is restricted by financial and administrative constraints. In many urban housing developments in developing countries in recent years the successful outcome of such project has been partly due to the status of the land for development. The government effort to rectify this situation in Iran has been the creation of the Urban Land Organisation as discussed in Chapter Seven. The main responsibility of the organisation is the appropriation and distribution of land to low income people.

In this case the organisational infrastructure for low-income housing production has been created. What is required is slight adjustments to its procedure in selecting the correct target population and its speed of operation. The main criticism regarding the target population is that the real groups in need of housing i.e, those without stable employment and regular income are kept out. In order to have access to land one of the main conditions is to provide proof of regular

income to pay for the land and the ability to build a house within a year of the allocation of the plot. This initiative has been particularly successful in making more effective use of land by imposing higher residential density, provision of space for the necessary retail, commercial and service activities. As much of the implementation has been through the formation of co-operatives or self-built process the level of technology used is much more realistic. Apart from a few schemes there has been a move away from prefabrication and extensive and un-necessary use of modern building materials. The success of such initiatives has been reliance on the indigenous construction industry in Iran.

Development and improvement of the indigenous construction sector could contribute to overall development of Iran. In order to develop the indigenous construction sector a number of issues need to be considered. These include the development of manpower resources, the building materials sector and plant and equipment production facilities.

The development of manpower resources could be achieved by the diversification of training potentials, the promotion of new training methods and improving the existing training procedures. Such measures include both the conventional apprenticeship system or through the formal education system. Establishment of vocational training institutions in turn require greater mobilisation and co-ordination of resources. Therefore it could be argued that by improving the education of skilled labour and technicians more effective use of construction resources could be made. The examination of the construction industry in Chapter Four and the Survey of construction firms in Chapter Five illustrated the extent of problems involved in obtaining construction materials, skilled labour and competent managers.

To solve the acute shortages of construction materials especially in the context of post-war reconstruction, there is a real need for identification of available resources and ways and means of production and distribution. The development of the building materials' sector will depend on the promotion of indigenous building materials and components. Much of the problem regarding the shortage of materials could be attributed to bad quality domestically produced materials. The dilemma facing the domestic producers of building materials is the competition with imported foreign materials often of much

higher quality. This is partly due to incorrect methods of production. The government could provide assistance with the improvement of indigenous methods of production technology by research and diffusion of such results. Increased competition among the producers of indigenous building materials could improved quality. The standardisation of the manufacture of building components also could help improve the quality of locally produced building materials. The private sector can plays an import role in the production and distribution of materials. Since 1979, the private sector has not been involved in this process. The political uncertainty and exclusivity of foreign exchange to selected individuals with vested political interest has been the main constraint to the involvement of the private sector.

The indigenous production sector needs government support in the form of controlling and monitoring of import of construction equipment, machinery and tools in order to minimise unfair foreign competition. Effective utilisation through the development of a comprehensive programme of repair and maintenance and spare parts production facilities.

Based on the findings of the survey the private construction sector is in need of financial support. This is particularly true in the case of domestic contractors and producers of construction related products. Studies carried out by the International Labour Organisation, The United Nations Industrial Development Organisation and UNCHS (Habitat) point out to support of the private sector by financial incentives and the provision of credit facilities, soft loans and tax incentives. Our own study of a typical firm showed that many small contractors fail because of government's delay in meeting payment for the work done and other unnecessary complicated contract procedures. Increased use of private sector investment in the financing of development projects including housing for low income families, and the provision of infra-structure, could ease the burden of government. In this context the Japanese experience in mobilising private sector capital in the implementation of small and large projects is of particular relevance. In this relation it is not only the raising of capital which makes private sector involvement in development possible. It is the whole sophisticated method of administrative support, educational and simplified contract procedure reinforced with innovative policies regarding planning and implementation which act as major incentives for

private sector involvement.

The diverse geographic, climatic and geological conditions of Iran call into question the universal adoption of standard technologies and materials for construction. The regional differences in availability of indigenous materials and methods of construction are good indicators as to the appropriacy of particular technology and resources. This creates difficulties regarding the earlier argument in favour of standardisation of building materials. It is conducive to standardise construction materials and building methods but the numerous earthquakes affecting the different regions dictate location specific solutions to building production. The setting up of appropriate building regulations and standards which are relevant to regional variations in resources and environmental considerations, especially with regard to natural disasters. In Chapter Eight reference was made to regionalisation of housing in Japan.

The relevance of this argument to the overall theme of this research is the innovative nature of such an approach. This strategy shows the awareness of the formal construction sector i.e the Building Research Centre of the informal and indigenous rural construction potentials. It is the recognition of the disappearance of traditional indigenous crafts in regions and rural areas as a result of excessive use of factory made production system that prompts appropriate action. Thus regionalisation of housing policy helps preserve and promoted the indigenous methods of construction and utilise local reources. This also illustrates the role of research in construction. However such research will be useless unless there is systematic dissemination of research results to private sector for wide scale use of new products and research results. Research could play a vital role in adoption and modification of appropriate construction technology.

In the earlier parts of this chapter and the relevant chapters on the planning and construction processes much emphasis has been placed on the relationship between technology and planning policies. This was one of the main parameters set in the development of the research objective in investigating the planning construction inter-actions. In each of the countries examined in this study, it was shown how different economic and physical development planning strategies affected the choice of technology at national, regional and local settle-

ment levels. Within this context the appropriate technology concpet is recognised as an effective alternative in developmetn strategies. Advocacy of appropriate technology should not be interpreated as a neo-Malthusian view of limits to growth and anti-industrialism as argued by Amirahmadi (1988). As the research has pointed out given the many constraints in the application of foreign technology to the production of the built environment in the developing countries it is important to outline what policies could be adopted to foster the development of appropriate technology. The adoption of appropriate technology and appropriate construction resources is particularly vital in the post war Iranian context with limited foreign exchange earnings. With this in mind it is important to note that different technologies require different skills.

Labour intensive technologies could help greatly reduce the massive unemployment situation in Iran. Innovations in development of new technologies which can utilise locallly available resources in terms of efficiency. Decision on the choice of particular technology necessitate major socio-economic and political consideration. The recognition of the limits to the application of modern technology as the magical solution of problems of housing and infra-structure. The importance of such argument was illustrated by the examination of the implication of the crash housing programme in Iran. Evidence from Iran and other countries in the developing world indicate that as far as housing is concerned use of prefabrication and modern methods of production require large initial capital outlay with limited long term success. The central argument here is that it is not only the financial implications which make this method of housing production obsolete but most importantly the long term technological and political dependency.

Japan showed that import of modern technology in construction could be benefitial providing that it is firstly closely examined and adapted according to the local needs and secondly the way it is modified and diffused within the society. There might evolve a typology of technology for different uses i.e the modernisation of construction technology especially for the implementation of strategic projects. In the post war context there is a golden opportunity to promote such a policy. For the first time there seems to be a consensus amongst the professional community in Iran for such a move. However the successful adaptation and use of technology requires the improvement of the management system especially that regarding

the private sector companies.

The examination of the planning and construction processes in three different countries has illustrated some common issues in their development. In the aftermath of the Second World War the three countries had a common goal. This was to modernise through industrialisation in order to gain political and economic independence. The achievement of each country has been greatly determined by their overall strategy for development and exploitation of national resources. The utilisation of factors of production i.e land, labour and capital has been achieved through different approaches to planning and implementation.

In Japan this was achieved by high profile intervention of central government in long term strategic planning and providing continuous support for the private sector. The occurrence of the Korean War played an important role in demand for Japanese industrial products and much needed modernisation. The Japanese construction industry played an important role in the economic development of that country. The private construction industry was a major contributor to this development. The development of the industry as shown in Chapter Eight is the result of continuous research by both government and private sector research organisations.

The practice of "Dango" amongst the Japanese private contractors although not particularly scrupulous, has an advantage for the private construction sector. This practice is not legal in Japan, but it is practised by the large and small construction enterprises. Such cooperation ensures a degree of organisation and unity amongst the contractors. However it is about preserving self interest at the expense of the community. In the Iranian context, the private sector is not united in its efforts to improve both the image and fortune of the construction industry. The long term development of Iran requires a period of consolidation which would allow for the utilisation of all the untapped resources. The Chinese experience is a good example of such policy. The promotion of community development based on community participation is dependent on national reconciliation and "trust" between the people and the government. This will be the determining factor for the post war development.

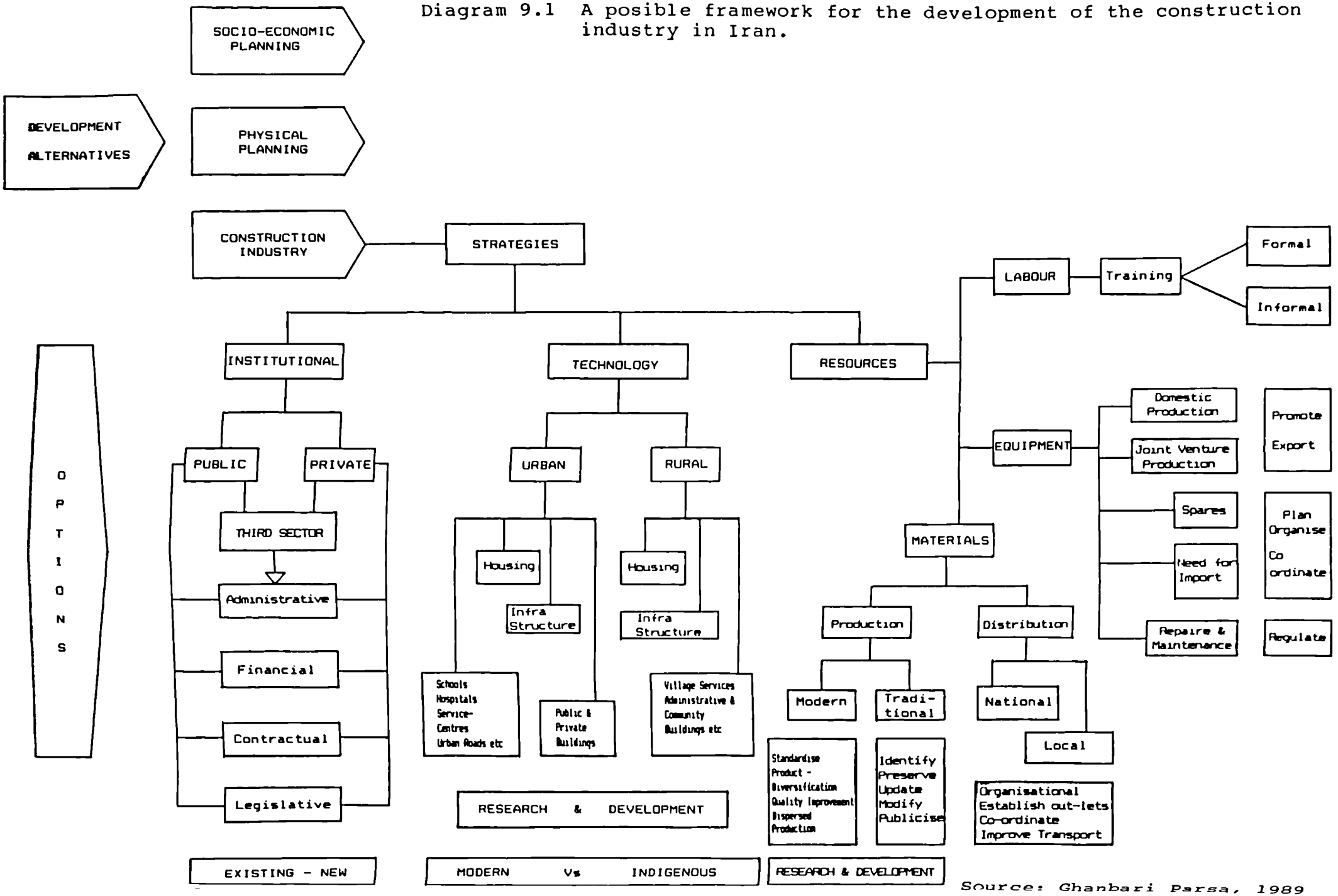
The most urgent problems in Iran at present seem to be both organisational and procedural. Whilst there is a genuine desire on the part of the government for self-sufficiency and technological independence, at the same time there is a continuing piece-meal approach towards the construction industry. The government's stated objective in achieving technological and economic independence does not match its practice. Despite much pleading by the private construction firms for support, the government has once again turned to the foreign companies for the implementation of many strategic projects. Such projects can be implemented by Iranian contractors if the government devotes a fraction of the support it gives to foreign companies. Already many contracts have been signed with Japan, West Germany, Italy, France, Turkey, China, the USSR, eastern Europe, South and North Korea and Brazil. This is part of an effort in filling the gap caused by the shortage of people needed to build complex institutions such as basic industries and infra-structure. Another obstacle to the reconstruction is the lack of appropriate institutions and the existence of many organisations whose activities overlap. Further complications include the confusion over the role of the private sector and its contribution to economy. As Amirahmad notes:

> 'The state must decide whether there are limits to private ownership and wealth accumulation. If so, the specifics of such limits must be clearly spelled out. Otherwise, wandering private cash holdings will fail to contribute to the reconstruction of productive sectors: it would remain partly idle, with the rest continuing to be invested in services and leaving the country. (Amirahmadi 1990, p42)

The existing research on the role of the informal and institutionalised private sector in the development of the construction industry indicate that they can make significant contribution to production and distribution of construction materials. Further smaller construction firms are more flexible in adopting to the use of different materials and methods of construction. Diagram 9.2 shows the framework for a possible development strategy for the construction industry in Iran.

In concluding this study it must be pointed out that it was not the objective of this thesis to act as a blue print for

Diagram 9.1 A posible framework for the development of the construction industry in Iran.



Source: Ghanbari Parsa, 1989

future development of Iran. It merely attempted to examine some of the issues bedevilling the development process in Iran.

9:4 Limitations of the Study

The Hypotheses of the thesis were of a generalised nature partly as a result of the subject of the study. A multi-disciplinary research approach by nature does not allow a very detailed examination of the issues concerned. However, a survey of the available studies on aspects of planning and the construction process would reveal that there is a serious shortage of research documentation either by government institutions or individuals. This work attempted to fill some of this gap.

The limitations of resources, especially with regards to information which could have been obtained through field-work were constrained as the result of the war. Much of the field-work, were carried out in a war-time context. The war and other related factors had caused widespread problems including security awareness. This is the main reason for the limited nature of the questionnaire survey. Although many government departments especially in Mashhad were particularly helpful in giving interviews or providing information, in Tehran however, every effort was made to discourage and disappoint the author. This kind of attitude could be justified as the result of constant bombings and air raids. The hostile attitude of some government officials towards most students who study abroad was based on the view "how could we expect those under unsafe conditions to provide us with information whilst we were living in the safety of Europe".

The survey could have been complemented by a synthesis of opinion of professionals in various planning and executive agencies to provide further empirical evidence regarding the interactions between planning and construction.

The changing context of post-war Iran also necessitated a re-emphasis of the post war reconstruction. Although much of the findings were the result of the war time economy and situation the post war situation so far has not shown any sign of improvement, rather further deterioration. Since 1988 there has

been 100% increase in the black market value of the dollar and further increases in the value of many building materials.

9:5 Areas for Further Research

Similar to any other studies, this research is by no means complete and, therefore, some of the areas which have been examined will require further investigation. On the question of the impact of planning policies on the construction industry in general and construction firms in particular, the questionnaire survey should be treated as a pilot study for further surveys.

A larger survey sample with either national or regional dimensions could provide further evidence of the impact of government policies on the construction companies. A complementary survey of both national and regional/local agencies involved in the planning and construction process could reveal valuable insight of the view of the planning agencies on the construction industry. The combined evidence of such a survey could be very beneficial for further investigation and analysis of the interactions between planning and construction. With regards to the nature of the work of small construction companies, the survey presented in this thesis is already being used for a much expanded version by another Iranian researcher.

As for the process of technology transfer, further monitoring of the work of public sector organisations in the small and rural towns with further empirical evidence could facilitate the understanding of this phenomenon. Any future work on projects which are initiated by what has been termed here as the "third sector" initiated projects will provide a good basis for research on the impact of such investment in the Iranian context. A suitable case for comparative study will be Japan where such a scheme has been operating since the mid 1980s.

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POST SCRIPT

Despite ten years of economic instability and eight years of continuous war, when compared with many other developing countries, Iran does not have any foreign debts. In a post war context many foreign and international companies are eager to offer credit for post war reconstruction. A continuous debate has been going on, focused on the merits of accepting credit by various governments and international agencies. This was further highlighted when the Prime Minister in his speech on the occasion of presenting the 1989 budget to the Parliement mentioned that;

> "the Government has had to resist the temptation of foreign credit and debt for ten years dsepite the war, and we can not afford to abandon the principles of the Revolution by accepting such tempting ideas.." (Keyhan Havaei 1989)

So far the wise men seem to have rejected the idea of foreign credits and the danger that it could pose pointing at the experience of many African and Latin American countries.

Despite the existence of a continuous economic and technological embargo for a good part of ten years the country has managed to pursue a measure of development which has been the result of a policy of self reliance. Although the pace of development has been slow, what has taken place has been as a result of the mobilisation of indigenous resources and development of home grown industries.

Iran is an exteremely rich country with vast amount of natural resources. In addition to oil reserves of some 7000 billion tons it posesses 27% of the non-communist world's gas reserves estimated at 13,600 trillion cubic metres. As well as oil and gas Iran has considerable mineral resources including lead, tin, uranium and copper. Iran has by far the largest population of any Middle Eastern country except Turkey and Egypt (Mofid, 1987).

In recent years a number of very innovative policies regarding national development and physical planning have evolved with

interesting solutions which could help reduce the dependency of the country on imported technology and expertise. This gives some hope. An indication of the importance attached to planning in the post-war context is the fact that the president has assumed personal responsibility of the Ministry of Plan and Budget. Given the right conditions, Iran has the potentials to achieve rapid development. The rapid revitalisation and reconstruction of some of the key industrial complexes within a very short time in the aftermath of the war with limited resources is evidence of such potentials. If the Iranian construction industry is supported by the government and provided with the degree of resources that is given to foreign consultants and contractors, it can play a major role in the reconstruction of the country.

The people of Iran who have made unimagined sacrifices in the safeguarding of the integrity and independence of the country should be given the chance to participate in the process of reconstruction.

APPENDICES

Official Title:	Islamic Republic of Iran
System of Government:	Elected President (four year term) Majlis (Parliament), 270 M.Ps Chairman of the Council of Ministers
Principle Religions:	Islam, Christianity, Jewism, and Zorostrianity.
Languages:	Farsi (Persian), Turkic (Azari) Arabic, Kurdish, Baluchi, Turkman
Currency:	Rial; US $1 = IR 80.70
Population:	49,764,874 at 1986 census
Area (sq km):	1,648,000
Density:	30.2 at 1986 census

Major Cities:

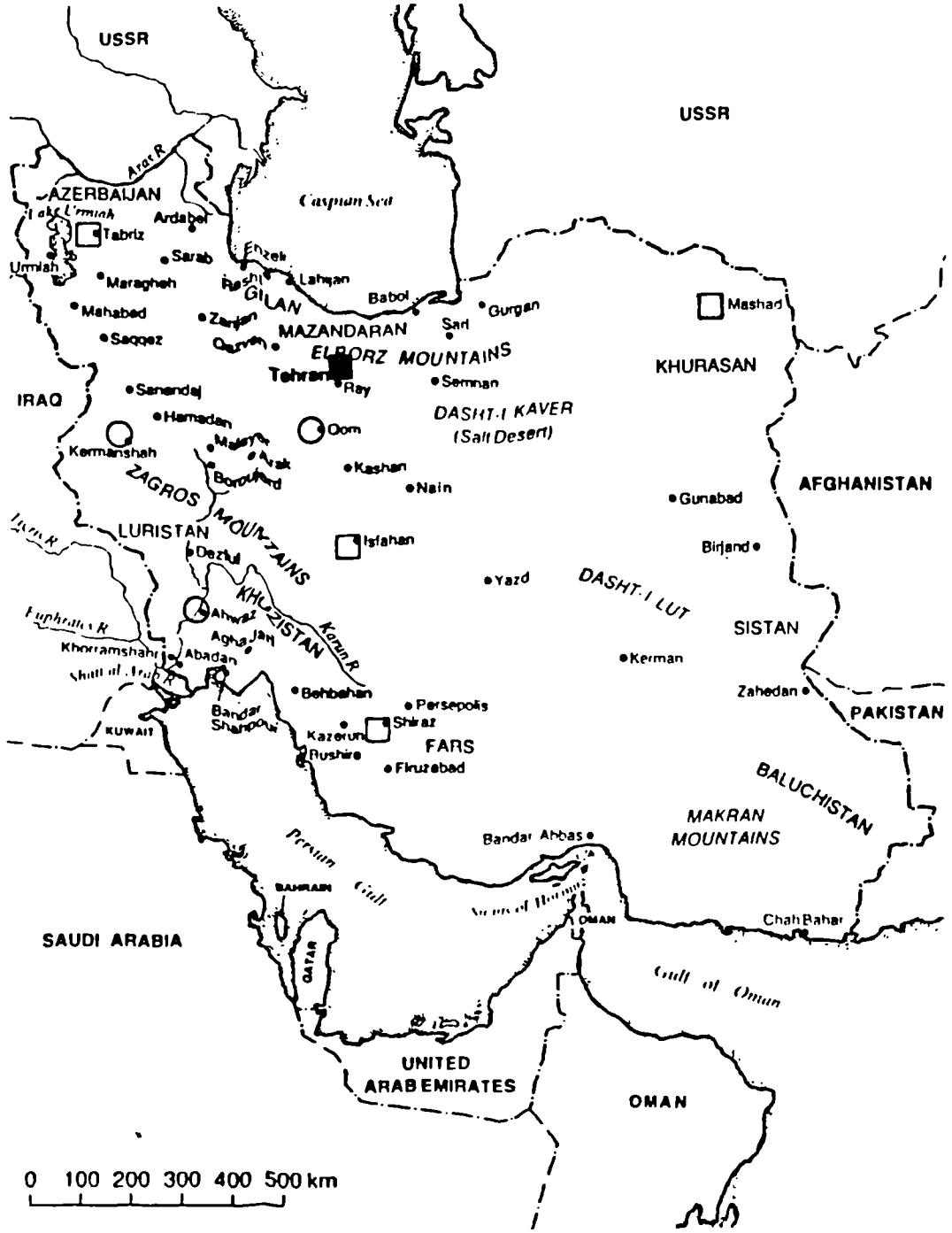
Tehran (Capital)	6,022,029 at 1986, October 8, census
Mashhad	1,500,000
Isfahan	1,000,000
Tabriz	852,296
Shiraz	800,416

Council of Ministers

Minister of Foreign Affairs
Minister of Education and Training
Minister of Culture and Islamic Guidance
Minister of the Islamic Revolutionary Guards Corps
Minister of Commerce
Minister of Health
Minister of Posts, Telegraphs and Telephones
Minister of Justice
Minister of Defence
Minister of Roads and Transport
Minister of Industries
Minister of Heavy Industry
Minister of Higher Education and Culture
Minister of Mines and Metals
Minister of Labour and Social Affairs
Minister of the Interior
Minister of Agriculture
Minister of Housing and Urban Development
Ministry of Energy
Ministry of Oil
Ministry of Economic Affairs and Finance
Minister of Intelligence and Internal Security
Minister of Construction Crusade (Jihad Sazandegi)
Minister of Planning and Budget
Minister of State and Head of State Welfare Organisation
Minister of State for Executive Affairs and Supervisor of Prime Minister's Office

Source: Fisher 1988

Map of Iran

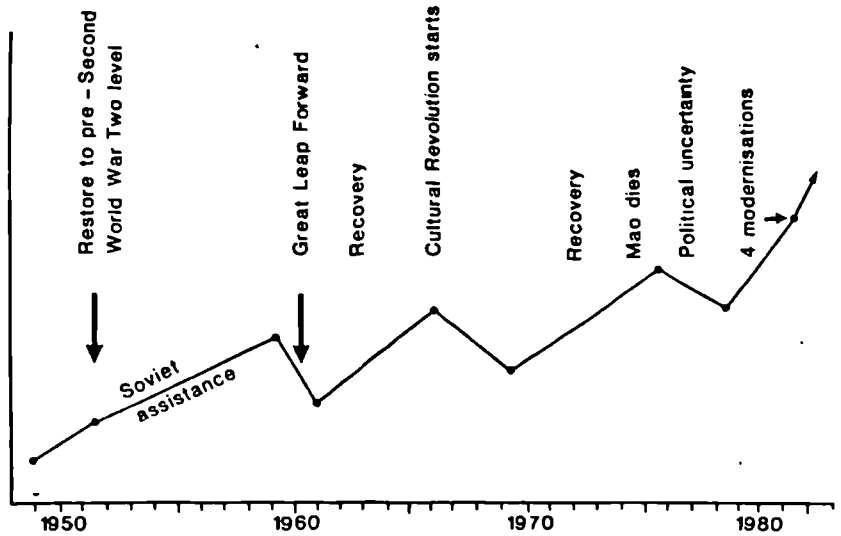

USSR
USSR
Caspian Sea
AZERBAIJAN
Tabriz
Ardabil
Sarab
Maragheh
Mahabad
Saqqez
Lahijan
Babol
Gurgan
GILAN
MAZANDARAN
Sari
Mashad
KHURASAN
ELBORZ MOUNTAINS
Tehran
Ray
Semnan
IRAQ
Sanandaj
Hamadan
Qom
DASHT-I KAVER
(Salt Desert)
Kermanshah
Kashan
Nain
AFGHANISTAN
Gunabad
ZAGROS MOUNTAINS
LURISTAN
Dezful
Isfahan
Birjand
Yazd
DASHT-I LUT
KHUZISTAN
Ahwaz
Agha Jari
Abadan
Khorramshahr
Behbahan
Persepolis
Shiraz
SISTAN
Kerman
Zahedan
PAKISTAN
KUWAIT
Bandar Shahpour
Kazerun
Rushire
FARS
Firuzabad
BALUCHISTAN
MAKRAN MOUNTAINS
Bandar Abbas
Persian Gulf
BAHRAIN
QATAR
OMAN
Chah Bahar
SAUDI ARABIA
Gulf of Oman
UNITED ARAB EMIRATES
OMAN
0 100 200 300 400 500 km
> 500,000
250,000 - 500,000
100,000 - 250,000
> 6,000,000
1984 Population

Official Title:	People's Republic of China
System of Government:	Chairman of the Communist Party Central Committee of the Communist Party People's Congress Prime Minister elected by National People's Congress
Principle Religions:	Buddhism, Islam, Christianity
Langusges:	Chinese, regional/local variations
Currency:	Yuan = 100 fen, jiao/mao = 10 fen
Population:	1,008 million on July 1, 1982
Area (sq km):	9,600,000
Density:	332.89, varies significantly from 2 in Tibet to 1296 in Beijing and 2050 in Shanghai

Major Cities:

Urban population in 289 cities in 1983, 100 million

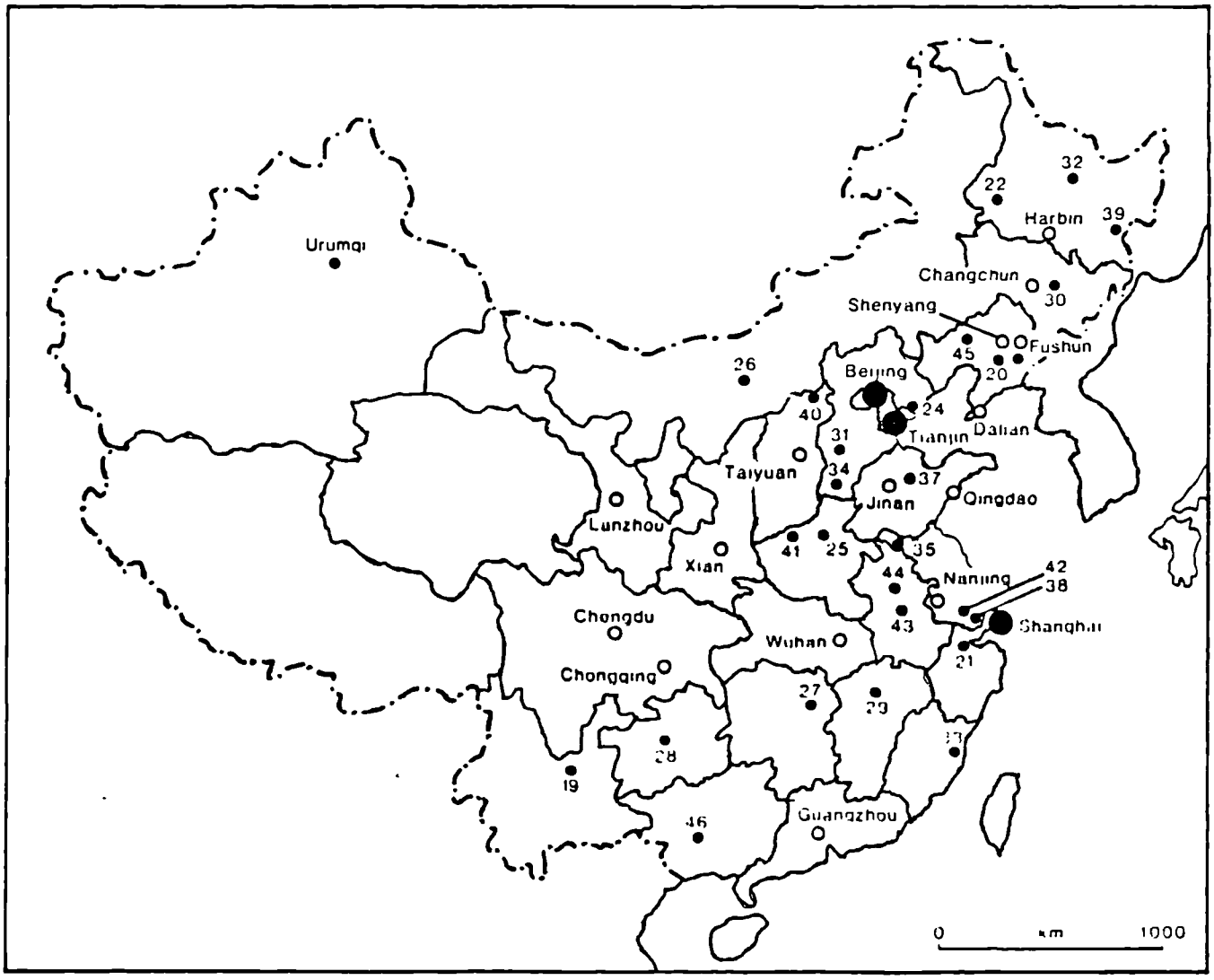
Beijing 1981	9019
Shanghai	11628
Tianjin	7628
Shenyang	5029
Wuhan	4101
Guangzhou	5537
Harbin	2460
Chongqing	6434
Nanjing	3680
Xian	2888
Chengdu	3957
Changchun	5689
Taiyuan	2149
Dalian	4645
Lanzhou	2330



Production of goods and services per inhabitant between 1950-1980

Source: J.P Cole 1985.

Cities of China with more than 500,000 inhabitants in 1982



● > 3 million

o 1-3 million

• 500,000 - 1 million

Urban Population 1982

Official Title:	Japan
System of Government:	Constitutional Monarchy Presently Emperor Akihito National Parliament, the Diet House of Representatives 512 members House of Councillors 252 members The Prime Minister chooses members of his cabinet
Political Parties:	Liberal Democrats (LDP) Socialists, Komeito and the Democratic Socialists, and the Communists
Principle Religions:	Buddhism "Mahayana", Shintoism
Language:	Japanese
Currency:	Yen
Population:	121 million
Area (sq km):	380,295
Density:	318
Urban Population:	104,281,000 (89% of total population)
City Planning Area:	91,271 sq km (24% of national teritory)

Major Cities

Tokyo 1983	8,170 million
Osaka	2,534
Nagoya	2,066
Yokoham	2,915
Kyoto	1,479
Sapporo	1,464
Kobe	1,381
Fukuoka	1,098
Kitakyushu	1,052
Kawasaki	1,049
Hiroshima	907

Ministries

Ministry of Construction
Ministry of International Trade and Industry
Ministry of Finance
Ministry of Foreign Affairs
Ministry of Agriculture Forestry and Fisheries
Ministry of Health and Welfare
Ministry of Transport
Ministry of Labour
Ministry of Justice
Ministry of Education
Ministry of Home Affairs
Prime Minister's Secretariate
Environment Agency

Source: The Ministry of Construction, 1988.

A4:1 The First Development Plan (1949-1955)

A combination of political and economic difficulties made it apparent that a systematic study of the country's resources and subsequently long-term planning of the public sector's expenditure are indispensible from a strategy aimed at developing the idle resources of the country and raising of the standards of living. The 17th December 1946 saw the signing of a contract between the Iranian government and the American Morrison-Knudsen International Company. The purpose of the contract was the conduct of such a survey. The recommendations of Morrison-Knudsen led to the award of another contract to the American Overseas Consultants Incorporated to address themselves to the following issues;

I. Evaluation of agricultural potential
II. Evaluation of potentials for increasing mineral production.
III. Evaluation of institutional and educational capacity.
IV. Review of existing conditions of public and private industries.

Table A4.1. Development expenditure in the First Development Plan (B.Rs). US$1 = 67.5 rials

Sector	% of total expenditure	Actual expenditure
Agriculture/irrigation	27.8	5.7
Industry/mines	20.1	4.1
Transport/communication	29.3	3.5
Social services	22.8	0.8
Power and fuel	-	-
Regional Development	-	-
Others	-	-
Total development	100.0	14.1

Actual as a percentage of planned expenditure 53%

Source: Compiled from The Economic Intelligence Unit, Quarterly Review of Iran, Annual Supplement 1978, p7 and Razavi et al, p21, 1984.

These attempts culminated in the drawing up of the First seven year plan, with the specific aim of the creation of the Plan Organisation (PO) to be responsible for execution of the Plan. The First Seven Year Development Plan which was enacted by the Iranian Parliament, represented a first attempt at organising the national allocation of public resources, based on a set of strategies for national development (Razavi et al, 1984, p20).

The first plan was allocated 26 Billion Rials, 37% of which was expected from the oil revenue. In addition to this there was a promise of a loan to the tune of 32% of the expected budget from the International Bank for reconstruction and Development (IBRD), but this was cancelled as the result of the oil dispute.

One of the benefits of the first plan was that it instigated debate over the mechanism of planning in Iran. It also gave rise to two opposing points of views that were never resolved. Some held the view that execution of the plan should be decentralised through existing ministries and agencies with only a supervisory and powerless role for the Plan Organisation. The other view held saw the need for a strong executive agency. The latter won the day, but unfortunately it later gave way to inter-governmental rivalry with the effect of reducing the effectiveness of planning.

A4:2. The Second Development Plan (1956-1962)

Many observers see the second plan as a continuation of the first plan both in its actual structural contents and achievements. This was because of the fact that due to the disruptions caused by the nationalisation of oil industry and the shelving of the First Plan. The second plan was drafted on the basis of October 21, 1954, agreement between Iran and the international oil companies. The Iranian planners had already based the development plan on income derived from the export of oil (Razavi et al 1984 & Mofid K 1987). The original budget was 70 bn.Rs and was increased to 81.1 billion rials in 1957. However by 1958 the cost of many projects was higher than anticipated, therefore requiring a revision.

With the drop in oil revenue and the decrease in PO's share of the revenue, caused the cancellation of many projects. This also gave rise to uncertainty of the size of various projects of the plan with govrenment agencies not knowing what to expect. Despite this the PO managed to keep control of over 50% of the overal public investment during the second plan. The total expenditure in the second plan reached 83 bRs.

The second development plan aimed at the creation of an expanding, integrated national market by the establishment of a transportation system, protection of local consumer industry and utilization of capital intensive techniques in agriculture. In fact the second development plan was not a comprehensive plan and there is no evidence suggesting that the planners had adopted any clearly defined planning methods nor a method of ensuring internal consistency in the plan. It was simply a list ofprogrammes and projects. There was a great deviation between the original plan and its actual outcome (Daftari,F 1973).

Table A4.2. Development expenditure under the second development plan compared with the first development plan.

	FIRST	SECOND
Agriculture/irrigation	15.7	17.4
Industry/mines	4.1	7.0
Transport/communication	3.5	27.3
Social services	0.8	9.3
Power and fuel	---	---
TOTAL	14.1	83.2
Actual as a percentage of planned expenditure	53%	95%

Source: The Economic Intelligence Unit, Quarterly Economic Review of Iran, annual supplement, London, 1978. p7.

During the second plan 81.5% of the funds were spent on "economic affairs" and 86.5% of the funds allocated to social affairs were spent on "regional development projects" mainly agro-industrial projects. It must be noted that social affairs received only 2-3% of the total funds. Amongst the priorities was the creation of a national transportation network with the allocation of 40.5% of funds. this was seen essential for the creation of an integrated monetized market. The second priority was for irrigation projects to provide regular water for agriculture and electricity for houses and factories. Industry received 11.2% of funds, most of which was spent on the revitalization of government owned industry and on credits to provide sector investment in textiles, cement and food (Ghaffarzadeh, 1981).

With the coming to office of the Kennedy administration in January 1961 in the United States a new thinking towards the relationship of the American government and its pro-western (capitalist) countries in the Third World evolved. The new administration believed that for political reasons the only way to preserve the pro-western states in the third world was to put through a reform programme within which land reform held a special place. The Kennedy administration had let it be known that it would only continue to support the Shah on condition that he put through a programme of reforms (Halliday F 1979). A $35 million US loan was made dependant on certain policies being implemented. Between 1960-1963 a series of reforms were announced by the Shah under the slogan of the "White Revolution" and land reform programme as one of the main elements was pushed ahead vigorously. This period marked a turning point in the development of the Iranian state (Marvin Zonis 1971).

A4.3 Third Development Plan (1962-1968)

It was in 1963 when the country was emerging from the aftermath of the 1960-63 period and the "White Revolution" that the third development plan began. The main effect of the reform was the transfer of financial capital, locked in rural lands, to government owned industrial plants, construction and financial sectors (Halliday F 1979). The survival of the transfered capital required the protection of national industry. The third plan aimed at "intensive agricultural policy, industrialisation and creation of a viable infra-structure". However the intensive agricultural objective was to be persued by "modern and intensive production methods" which were not within the technical and financial abilities of the newly freed peasants (Haliday F 1979)

The third plan was the first National Econmic Development Plan that really contained specific development strategy, with overall development objectives and some sectoral growth rates (Amouzegar J. and M.Fekrat. p.50.). For the first time in the history of Iranian planning, the plan consisted of a carefully calculated set of goals covering the whole economy. Beginning with the Third Plan, the "Iranian planners' quantative goals played an increasing important part in setting the frame-work of economic activities for the country's public and private sectors"(Mehner, Herald 1978,p187). The Third Plan period also assumes importance in the sense that it came to rely more on oil revenues and less on receipts of foreign loans and credits. The steadily rising oil revenues and P.O's increasing share of that helped this increasing dependence of the plan on oil revenues. The period also witnessed a growing influence of the P.O within the administrative structure in general and economic planning in particular. Ministries and other exexutive agencies were to present their plans to the planning committees of the P.O, and if found suitable within the overall frame of the plan, execution would be left to the ministries (P.O. Report 1977). The target of growth in The Third Development Plan was set at the rate of 6% per annum with such issues as employment, income distribution, price stability and balance of payments very much as side issues (Daftari 1973).

The target itself was based on a set of assumptions, some on the basis of the economy's previous experiences and mostly arbitrarily established. This was a refelection of the extent to which planners were handicapped in their efforts due to lack of information concerning the economy and society (Nattagh, Nima 1984, pp 35-36).

The planning procedure was therefore divided into two stages. The first stage involved sectoral allocation of public and private investment in order to reach the predetermined growth targets. The other stage contained a list of the projects that were to be provided to each sector. In practice however many ministries did not cooperate and in fact P.O was pushed hard to come up with a detailed list of projects. The process of

project evaluation was not subject to cost-benefit analysis. The Plan Organisation though part of the administrative machinery of the government, was subject to a great deal of interference by political authorities. The political authorities including the Shah himself often ignored the professional approach of the P.O towards formulation of development plans (McLachlan K.S, 1977, pp138-139).

Table A4.3. Development expenditure under the third development plan compared with the first and second development plans.

	FIRST	SECOND	THIRD
Agriculture/irrigation	15.7	17.4	47.3
Industry/mines	4.1	7.0	17.1
Transport/communication	3.5	27.3	53.8
Social services	0.8	9.3	43.1*
Power and fuel	---	---	32.0
TOTAL	14.1	83.2	204.6
Actual as a percentage of planned expenditure	53%	95%	89%

*Housing, Health and Education

It appeared in the early 1960s that the specialists in the P.O were to continue planning for a minimum of economic growth without ensuring the structural development of the economy (Mc Lachlan K.S 1977, p135). In the field of manufacturing investment, for example the Third Plan was to rely heavily on the provision of funds through newly created credit institutions, such as the Industrial and Mining Development Bank of Iran (IMDBI) and industrial Credit Bank (ICB), to the private sector.

The growing awareness within the P.O that there must be change in planning procedure was also matched by a fundamental change in the philosophy of what in effect was regional-development policies: Qazvin, Gorgan, Jiroft and Kohgiluyeh. During 1962, the P.B.O (the P.O now became Plan and Budget Organisation P.B.O) initiated the establishment of its own "technical offices" for the purpose of assessing and preparing regional plans. These were set up in all Ostans (provinces/regions). Other duties of the Technical offices included the reponsibility for implementation, pending ratification of their proposals by the P.B.O in Tehran.
However in 1963, it was decided that, because these offices did not posess decision-making power, their function was limited and unsatisfactory and thus they were amalgomated with the newly established Ministry of Housing and Urban Development. The administrative aspect of regional development in the Third

Plan, can be seen as a series of measures to create local institutions with power to prepare and implement projects.

A4:4 Fourth Development Plan (1968-1973)

The Fourth Plan commenced as the continuation of the Third Plan in objectives and philosophy and it was launched amid an atmosphere of economic confidence. Amongst its goals given the failure of the agricultural policies of the Third Plan the Fourth Plan proposed the expansion of the industrial base as a means of providing a future substitute for oil revenue which was the one and only important factor in the economy.

The industrialisation on policy as the corner stone of the Iranian economic development strategy was based upon, the use of local resource base, in the form of exporting products and byproducts of oil and natural gas, not the crude form. Secondly, development of heavy industries, mainly metal in the shape of iron and steel production and thirdly, the production of consumer/ consumer durable goods. The plan aimed at

> "an increase in production via strengthening production forces by emphasising industrial expansion, effective increase in capital productivity and full utilisation of modern production methods" (Farzanehpour, N p117).

In order to achieve a more just distribution of income, a policy of employment generation commenced together with provision of social services and development activities especially in the rural areas (Farzanehpour. N. p118). It was also during this period that in the field of regional development the "growth pole" theory became the model in allocation of investment resources. The fourth plan saw a high growth rate of the economy. GNP grew by an average of 11% in real terms. Most of the growth occured in the petroelum and service industry (Mclachlan, K.S p148).

A number of agricultural and industrial "poles" of development were identified in order to form the focal points of economic activity through which population movements, provision of public services and investment could be co-ordinated, but it was not before the 1970s that the poles of developments came into real being. The increased oil revenue enabled the P.B.O to expand its activities and ambitions. To begin with the number of allocation sectors were increased from 10 to 16. Amongst the sectors, education was divided into education and sport and art and culture, the rural and urban development sector into urban development and rural development sectors and the manpower and labour sector was enlarged into the social welfare sector.

Communication and transportation were separated in the economic affair sector. The energy sector was divided into water and electricity and oil and gas and in order to encourage tourism a new sector tourism was created. During the Fourth Plan 41.6% of the budget (double the third plan) was spent on industrial programmes and the establishment of industrial poles in Ahwas, Arak, Tabriz and Mashhad where joint ventures were sought to set up assembly lines for intermediate and heavy industries, with full support given to the private sector. Other emphasis were put on Transportation (21.7% of budget), in order to create a national market, the agricultural sector to increase production through increase in productivity and although the share of the social services sector particularly of helath and education services decreased in the Fourth Plan, it still received 20% of the total funds for the provision of houses, education and health (Mclachlan, K.S. p134) table A.5.

Table A4.4. Development expenditure under the Fourth development plan compared with the first, second and third development plans.

	FIRST	SECOND	THIRD	FOURTH
Agriculture/irrigation	15.7	17.4	47.3	41.2
Industry/mines	4.1	7.0	17.1	113.1
Transport/communication	3.5	27.3	53.8	71.4
Social services	0.8	9.3	43.1*	73.5
Power and fuel	---	---	32.0	79.9
TOTAL	14.1	83.2	204.6	506.8
Actual as a percentage of planned expenditure	53%	95%	89%	91%

*Housing, Health and Education

Source: The Economic Intelligence Unit, Quarterly Economic Review of Iran, annual supplement 1978, London p7.

The preference for industry and continuous changes in agricultural policies, generally with the aim of the enlargement of farm size and the introduction of modern methods of production, resulted in a low growth rate for agricultural production (nearly 4% p.a). Given that the increase in per capita income had increased the demand for food stuff with a population growth of an average 3% the rate of growth of agriculture was unsatisfactory (Graham R, 1978, p79).

It is fair to say that the Fourth Development Plan was significant in terms of its contents that took an overall view of

Iranian spatial planning. Whilst the Fourth Plan went a long way towards establishing the basis for further growth, it also revealed some of the constraints that continue to plague the Iranian economy, and that are likely to slow down its rapid expansion and also absorptive capacity in the future. To overcome these constraints (mainly the country's shortage of technically trained personnel and the economy's inability to provide productive employment for a rapidly growing labour force), the Fifth Plan (1973-1977) marked a sharp change in the country's orientation towards development (Looney R, 1977. p22).

A4:5 Fifth Development Plan (1973-1978)

The 1973 oil boom brought with it a sudden surge of income in the form of foreign exchange to most of the oil producing countries. In Iran this led to a massive injection of investment into the economy.

Iran had joined the Organisation of Petroleum Exporting Countries (OPEC) when it was established in 1960, but throughout the decade the price of oil had been static. Then, beginning in 1970, the OPEC states were able to reduce excessive production and to raise the price several times over. Oil price rose from $1.79 a barrel in 1971 to $11.65 in December 1973. Iran, being one of the producer states most in need of oil revenues, supported the moves and in February 1971, the Shah presided over an OPEC meeting in Tehran at which a co-ordinated breach in the oil companies' control of prices was made, and this led to a massive injection of investment into the Iranian economy (Halliday F, pp142-143).

Given the government's preferences for industrialisation and abundance of financial capital the government decided upon a massive investment programme ($24.5 billion) later revised to ($70 billion) seven times the Fourth Plan. In revising the Fifth Plan four basic considerations were of paramount significance to the planners:

> First, the shortages of domestic and foreign revenues, which had limited the size of previous development plans and influenced their order of priorities, was no longer a constraint. With the near certain prospects of continually raising oil revenues, the planners chose to aim at the maximum attainable growth in all sectors of the economy.
>
> Second, in setting the new priorities and growth targets, the planners remained mindful of such constraints as the country's inadequate supply of skilled manpower and technical personnel. The size of the plan was therefore

intended to be commesurable with the country's domestic absorptive capacity, and allowances were made for potential new foreign investments.

Third, for the first time an attempt was made to co-ordinate the process of five-year planning with the annual budget:in theory the revised Fifth Plan's expenditures were to parallel annual budgetary allocations closely (Looney R, 1977, pp25-27).

Finally the new plan was to be set up in the context of a long-term, twenty five year perspective linking it to the as yet undrafted and unstructured Sixth and Seventh Plans.

The Fifth National Development Plan attempted "squeezing the P.B.O's 20 years macro schemes into 5 years (Graham R, p80). During this period each ministry became responsible for its own project proposal and implementation, amidst the absen- ce of an effective co-ordinating role by the P.B.O (Nattagh N, p45). It could be said that the Fifth Plan established to achieve the following basic aims;

I) to raise as much as possible the level of knowledge, culture, health and welfare of the society.

II) to attain a much more equitable distribution of national income, with special attention to the rapidly increasing rise in the living standard and welfare of the under-privilaged groups.

III) to maintain the rapid and sustained rate of economic growth parallel to relative price stability and balance of payments.

IV) to provide productive employment in all regions of the country at a level that would absorb all the new manpower joining the labour market and substantially reduce concealed or seasonal unemployment.

V) to operate fully the established production capacities built under the previous development plans, and to raise productivity and efficiency in the supply of goods and services in the public and private sectors.

VI) to improve the administrative order, in keeping with the grand national aims and objectives, and to strengthen the country's defence capacity.

VII) to protect, improve and revitalise the living environment

VIII) to increase Iran's share in international trade, particularly in manufactured goods (P.B.O 1975, ch 1).

The developmental expenditure became more politically orientated during the Fifth Plan. The main goal was to lift the country to the level of the five big powers, these being U.S.A, U.S.S.R, France, Germany amd Britain (Graham, 1978 p80).

The plan attempted to expand industrial production, to promote the export of industrial goods and to provide social welfare. Clearly the basic means towards the attainment of these ends was financial capital. The allocation of investment funds reflects the goals and objectives of the plan. Industry had the highest priority (47.7%) and transportation received the second largest share (18%). This allocation was justified on the grounds that industry was to be the future substitute for oil and that industrial expansion needed a strong infrastructure.

Table A4.5. Allocations of the Fifth National Development Plan.

ALLOCATIONS OF THE FIFTH PLAN, 1973/74-1977/78

	$ mn	% of total
Agriculture & natural resources	4,582	6.6
Industry & mines	12,539	18.0
Transport & communications	7,292	10.5
Housing	13,704	19.7
Oil & gas	11,722	16.8
Others	19,773	28.4
Total	69,612	100.0

Source: Plan and Budget Organisation, Tehran.

During the years 1973-1978 there were constant shifts in government policy in reaction to gross overheating of the economy in the mid-1970s and to sharp falls in revenue later on. There was severe inflation, a massive drift of population to the towns, a marked downturn in agricultural development, competition for scarce resources and a predictable failure of the infrastructure to cope with the rate of expansion in what was essentially an import-led boom. These factors caused both by the growing economic crisis and fear of arbitrary political intervention in its affairs, withheld its support. As the economy went into sharp reverse, after a frantic drive into accelerating growth, the fallout in unemployment, disappointed aspirations and political unrest was considerable. This period marked the beginning of the downfall of the previous regime.

Adoption of the Fifth five year Plan in 1973 brought important changes in the system of plan administration and implementa-

tion. The Plan and Budget Organisation was no longer responsible for financial disbursements by the executive ministries, which themselves drew funds directly from the Ministry of Finance. The P.B.O became responsible for the task of long term planning and an advisory role (E.I.U 1977, p7-8).

Falling oil revenues, a trend that became apparent in mid 1975, led to a re-appraisal of the Fifth Plan's prospect by the government. While the official forecasts of expenditure were not changed, in effect the plan expenditures were spread over six rather than five years. Thus a large number of individual projects within the plan were postponed and most projects adopted in the boom period of 1974/75 suffered a similar fate.

In 1978 the government announced that "for planning purposes the government would adopt a combination of two-year short term plans with ten or twenty year long term plans (E.I.U 1978,p8). In effect a sixth plan, scheduled to begin in 1978, was not announced and the traditional five year plans appeared to have been shelved had the regime survived the political upheavals of 1978/79.

A5 The Process of Economic Planning

Since its inception in the immediate post war years, to start with planning process went through an evolutionary stage in the 1950s and 1960s. The planning process; including the preparation and the implementation of plans was the responsibility of the Plan Organisation (PO) which was established in 1949. Apart from the PO which later became known as the PBO, Plan and Budget Organisation (in 1962), and currently MPB, Ministry of Plan and Budget, there are other agencies involved in the process of planning. The functional role of these agencies will be discussed in the later sections of this appendix.

A5:1 The Preparation and Implementaion of Development Plans

The process of plan preparation and implementation has differed at various times (Yarshater E 1986, p352). To start with the first two development plans were merely an official list of public projects. However by the time of the Third Development Plan it was realised that there was a need for preparation of comprehnsive and coherent plans which paid due attention to various notions of macroeconomic and sectoral consistency. Thus a systematic process of plan preparation and implementation evolved. The institutional approach to preparation of development plans is described in the next section.

A5:2 The Preparation of Development Plans

In Razavi et al's (1984) book, which is the most extensive account of planning and development in Iran so far, six major steps in the preparation of development plans are recognised.

1. The first step was the preparation of initial targets and startegies for various sectors of the economy by a number of sectoral committees. As the planning system and machinery matured, there were some changes made. For example in 1977-78, at the time of preparation of the Sixth plan, the sectoral committees were made more reliant on the executive agencies, and the research organisations. This was an attempt to encourage a top-down, bottom-up procedure to planning which would create a consensus between those who prepared the plan and those who were in charge of implementation of the plan.

2. At this stage the output of the sectoral committees was sent to the Planning Division of the then PBO. With the help of the Coordination and Supervision Division a unified plan which included all the sectoral targets, and strategies and projects. The national plan expenditure together with the

predictions of financial, physical, and labour resources, were subsequently submitted to the Coordination Committee.

3. The Coordination Committee which consisted of high-level authorities was the major source of the top-down process of decision making with regards to the preparation of plans. It compared the available resources with the requirements of the proposed projects and issued the necessay guidelines to close the gap between the resources required and those available.

4. This stage involved the submission of the plan or the plan alternatives to the Economic Council. In a way it was at this satge that the political acceptability of the plan would officially entre the planning process.

5. After necessary modification, the plan was then sent to the High Economic Council. Prior to 1979, the Shah would have been present at this meeting. In the late 1970s, the ceremonial gathering of the High Economic Council was turned into the most crucial step of the plan preparation, thus dictating the basic goals and targets of the development plan.

6. After further modification of the plan by the High Economic Council, the prime minister sent it to the parliament. The Parliament thus provided the government the legal authority to implement the plan. The approved plan then became the basis for the annual budget.

The major criticism of the system of plannning in the 1970s was that once the plan was approved by the parliament, it became irrelevant to current policy issues. The next section will provide an insight of the plan implementation process.

A5:3 The Process of Plan Implementation

The process of implementation of development plan commenced when a project proposal was submitted by an executive agency. A detailed costed items, the work plan together with supporting technical documents were provided by the executive agency at the time of submission of the proposed project. The necessary documents were then forwarded to the corresponding sectoral bureau, which in turn sought the expertise of the Planning Division, the Budgeting Division, and the Technical affairs Division to appraise the project. The report then went to Project Approval Committee. The Committtee comprised of experts from the relevant divisions of the PBO and representatives of the executive agency.

Once the Project Appraisal Committee had approved the project,

it was sent for consistency check to the Composition Bureau. The bureau's work was concerned with compiling all of approved projects and fitting them into a consistent financial frame-work which was essential for preparation of annual budget for development expenditures. After the completion of all the consistency checks , the project's approval was then announced to the executive agency, the Ministry of Finance, and all divisions of the PBO. Upon this announcement several information gathering and decision making systems subsequently were activated. In the first instance the project's budget would be included in the expenditure plans of the Ministry of Finance. Then the corresponding sectoral bureau scheduled field inspections (Razavi et al 1984, p55). Then in oreder to monitor the project's physical progress and financial status, quarterly questionnaires were sent by the Informatics Division.

Once a project had been approved, its annual budget was allo-cated. The executive agency then had to request quarterly budget appropriations. this request went to the corresponding sectoral bureau, which used the reports from the Informatics Division, as well as inspection reports from its own field engineers, to propose a budget appropriation, which may have differed from the amount that the executive agency initially requested.

According to Amirahmadi (1986), during the Fourth Plan there was an attempt towards regional planning and decentralisation which occured with the introduction of Provincial Project Complexes, and the Town and Provincial Councils Law in 1971, by the then PBO. However as the result of reorganisation of the government sector after 1979, there was a further move towards the process of bottom-up and top-down planning, at least theoretically (MPB, 1982).

The information in this appendix refers to Diagram 3.2 in Chapter Three.

1: The Parliament and the Council of Ministers determine the overall goals and strategies for economic and social development and through the MPB different stages of planning is outlined. In order to assist with the determination of these goals and strategies, a group of MPB experts, study different senarios (alternatives) and prepare a set of corresponding goals. These overall goals are then examined by a special committee which consists of MPB experts, Parliament members, analysts from the universities and other organisations and the results are recommended to the Economic Council.

2: A flow of information on the requirements, resources and proposed programmes with respect to goals and priorities of economic development commences from the lowest levels of planning process namely from villages to the national level (bottom-up process). All the data and proposals received from the villages is sent to towns and subsequently to the centre of the province for classification. The information is analysed for the preparation of proposals for the development of various sectors in the provincial plan. In doing this the province authorities consider sectoral and regional guidelines that are conveyed from the central authorities. The provincial plan is then sent to the MPB and the corresponding ministries. Sectoral planning councils in each ministry examine the proposed provincial plans and once the necessary information regarding setoral plans is added, then it is forwarded in the form of comprehensive regional plans to the MPB. As indicated by the communication flow once modified, the plans and a report containing the resources and requirements of the plans are forwarded to the Council of Ministers and the Parliament. In the preparation and transmition of information from bottom to top, at each level, the necessary information is sent to the National Data Bank. The NDT publishes such information for the public use.

3: The MPB based on the goals and priorities set by the Cabinet and Parliament (in No1, with due attention to the situation of existing resources and national requirements (No2)) prepares long term (twenty-year) plan and medium-term (five-year) plan. In these plans, the extent of economic allocation to different sectors and level of their of growth, the level of oil exports, import and export of different products, necessary revenues for the government, government expenditure etc are determined. Therefore at this stage, the MPB prepares the unified plan or the the overall targets of the long tem and medium term national plans. The unified plan provides the framework for the prepartion of sectoral and regional plans which are prpared by the help of ministries, and provincial offices of MPB. The MPB communicate the results of the unified plan to authorities and planners from different

sectors in order to reach a consensus. If consensus is not reached by different actors, the Council of Ministers makes the final decision.

4: The MPB after consultation with and agreement of sectoral councils presents the Plan to the Council of Ministers and the Parliament for appraisal and approval. The line of communication in (4) between the Council of Ministers, the Parliament and the MPB represents the channel for modification, consultation and deliberations between the three parties. In reality the need for such process of consultation and agreement between different agencies is presented in the chart by the broken line (---).

5: The Parliament and the Council of Ministers communicate the approved plan to the MPB.

6.The Unified Planning Division of the MPB informs different sectoral bureaux and the regional planning division of the Unified Plan.

7: The Regional Planning Division of the MPB, based on the growth targets of different economic sectors and with the consideration of resources and potentials of different regions after consultation with the provincial branches of the MPB, determines the sectoral allocation for different regions to the Sectoral Councils.

8: The sectoral Planning "Councils" consisting of authorities, planning officials of ministries, agencies and offices of the MPB based on the information and proposals attained through channel (2), the results of unified plan obtained through (line 6) about the allocated resources to each sector and forecasting of the increased growth target, proposals received from the regional planning division of the MPB, and appraisal and sectoral studies of the Council itself, divides the allocated budget to each sector and different projects and infroms the provinces.

9: The High Council of Planning in the province with the help of specialised sectoral committees, identify potentials and requirements of the cities based on the proposals which have already been received from the different cities. Then the city councils are notified of the approved plan.

10: The City Planning Council, with the help of specialised committees divide the projects amongst different towns.
11: The Town Planning Council then distribute the allocated projects sent by the City Planning Council amongst the diffe-

rent villages. In this way a process of planning and notification of plans to those who implement the plans has taken place with the cooperation of the Village Council at the bottom to the Parliament at the top end of the planning system. This cycle of planning is repeated every two years and the previous plans are reviewed and appraised, and necessary modifications are carried out.

This appendix refers to section 3:4.3 in Chapter Three.

A7:1 The Planning Division

The Planning Division was to be the central part of the organisation of the planning system, in order to determine priorities in economic planning.In the late 1970s the Planning Division consisted of between six to ten bureaux amongst which were Planometrics and the General Economy Bureau, the Productive sector and Agricultural Planning Bureaus, the Social Planning Bureau, the Manpower Bureau, the International Economics Bureau and the Composition Bureau.

A7:2 The Coordination and Supervision Division

The Coordination and Supervision Division was the main body of the PBO as far as development activities were concerned. Its main task was to determine how resources were to be allocated among competing objectives. As the initial objective of establishing was to oversee the progress of a number of public projects, the Coordination and Supervision Division was therefore involved in the technical and financial supervision of these projects. The Division consisted of between ten and fifteen bureaux (the number varying at different times). Nine of these worked on a sectoral basis; the bureaux of manufacturing and mining, agriculture, transportation, health, and energy. The other two bureaux worked with all sectors, the Regional Bureau being responsible for ensuring equal distribution and allocation of the development budget amongst the country's twenty-three provinces, and the Composition Bureau being in charge of compiling the sectoral allocations to determine the budget's total expenditure on development.

A7:3 The Budgetting Division

The Budgeting Division initially was in charge of allocating the government consumption expenditures (Current Budget) to different public organisations. As the number of development projects increased in the late 1960s and 1970s, the Budgeting Division had to take the development activities of each government organisation into account in allocating the current budget. This necessitated close cooperation between the Budgeting Division and the Coordination and Supervision Division. The work of the two Divisions often overlapped and eventually this led to the two divisions being merged into one in early 1981.

A7:4 The Technical Affairs Division

The Technical Affairs Division was set up to ensure the technical (engineering) quality of the development projects through detailed studies of the engineering designs or technical evaluations of the completed projects and to help other government agencies select contractors or consultants for their projects. The Division comprised six bureaux, of which by the late 1970s only two remained active. The Contractors' Affairs and the Consulting Affairs Bureaus' task was to maintain information systems on contractors and consultants and their activities.

A7:5 The Informatics Division

The Informatics Division was established to promote the use of information technology and computer utilisation in the country, and it was allocated a substantial budget for this task. The division designed and developed computer systems considered to be useful to some users and attempted to persuade government agencies to use computer services. Many observers, including the staff of other divisions, have viewed the work of the Informatics Division as a waste of resources and time. Its work was seen to symbolise Westernisation which became a source of psycho-political discomfort to the bureaucratic system (Razavi et al 1984, p49).

A7:6 The Statistical Centre

The Statistical Centre was set up to oversee and co-ordinate the data collection efforts undertaken by the various government agencies and other organisations. Annual household budget surveys for rural and urban areas were carried out and the general census was performed every ten years. However, the centres' activities overlapped with the work of other government agencies including that of the Central Bank of Iran which enjoyed a better reputation. Therefore, its data and surveys were relied upon by different government departments.

Methodology of City Planning and Design from Preparation Stage to Implementation

This information relates to section 3:6 in Chapter Three.

Different stages of Plan Preparation		Comprehensive Plan	Detailed Plan
PREPARATION METHODOLOGY	REQUEST for PLAN (plan initiation)	Request by City Council otherwise, directly through Municipality to Dept of Housing & Urban Development or MHUD	Request by City Council otherwise, directly through Municipality to Dept of Housing & Urban Development or MHUD
	COST ESTIMATION	By Dept of Hsg & Urban Development based on guidelines from City Development & Planning Division	By Dept of Hsg & Urban Development based on guidelines from City Development & Planning Division
	DETERMINATION of PRIORITIES	By DHUD and consent of Provincial Planning Council (PPC)	By MHUD and consent of Provincial Planning Council (PPC)
	FUNDING of Credit for the plan	By Ministry of Hsg & Urban Development MHUD	By Ministry of Hsg & Urban Development MHUD
	SELECTION OF Agency for Plan Preparation	By DHUD & Cooperation of City Development & Planning Division of MHUD & consultation with MPB	By DHUD & Cooperation of City Development & Planning Division of MHUD & consultation with MPB
	SIGNING of CONTRACT	By DPUD & if necessary to acquire service or directly carry out the project preparation	By DPUD & if necessary to acquire services or directly carry out the project preparation
	SUPERVISION OF Plan Preparation	By the relevant Municipality or DPUD	by the relevant Municipality or DPUD

Different stages of Plan Preparation		Comprehensive Plan	Detailed Plan
APPRAISAL METHODOLOGY	QUALITATIVE APPRAISAL of Plan	By DPUD Deputy with consideration of the signed contract and expressing views to the preparation agency	By DPUD Deputy with consideration of the signed contract and expressing views to the preparation agency
	OPINION SURVEY	(1) placing of the proposed plan in the Municipality for public viewing for at least two weeks and publicising by the mass media. Efforts in public opinion survey by Municipality and with the help of DPUD and relaying of such views to the City Council and sending of the main findings to the Deputy DPUD within one month after the Municipality has forwarded the plan (2) to seek the view of other public bodies such as the Governor's office and other relevant agencies at the same time as (1) based on the public opinion survey by the executive agency thro the Deputy DPUD (3) to forward a copy of the plan to the technical council of City Planning Division to receive orders of modification within one month. The Council is the highest body for technical consultation	

Different stages of Plan Preparation		Comprehensive Plan	Detailed Plan
APPRAISAL METHODOLOGY	FINAL EXAMINATION	By a special commission in the area with the Mayor or the City Engineer, Provincial Governor's rep, City Planning Division's rep and the DPUD Consultant and the executive agency in charge of preparation of plan with due consideration of all opinions, views and modifications. the director of the Commission is the Deputy DPUD	By the works committee section 5 which consists of: members of the technical reps and other experts who are invited by the Commission, with due attention to all views, opinions and modifications of the preparation agency the director of the Commission is the Deputy DPUD
	Final CONTROL	By DPUD Deputy	By DPUD Deputy
AUTHORISATION METHOD		(1) the presentation of the plan to the City Planning Division after consent by the City Council in relation with the local plans and the Provincial City Planning Council in connection with regional plans in comparison with the members of the High Council of Planning in the Province and the High Council of City Planning in the Province should be in unity, because the authorisation in the Provincial City Planning Council is the same as in Prov.. Plan..Council	By Commission section 5 of the Establishment of High Council of City Planning Act

Different stages of Plan Preparation		Comprehensive Plan	Detailed Plan
AUTHORISATION CONT.	Final AUTHORISATION (cont.....)	(2) the presentation of the plan for final consent to the High Council of City Planning of Iran after the necessary investigation in connection with all general issues of the city in relation to national and local policies and principles of city planning by the technical council of the City Planning Division	
NOTIFICATION	NOTIFICATION of the AUTHORISED PLAN	Notification of Plans and other documents which are connected to each minister member of the High Council of City Planning through the Minister of MHUD for information and implementation of the Provincial Council and the relevant Province for notifying and carrying out of the directive by the Mayor for implementation	(1) Notification of the approved plan through the Directorate of City Planning in the Province to the Municipality and notification of the plan and other documents to each section of relevant organisation through the Provincial Government for implementation (2) Forwarding of one set of Detailed Plans to the City Planning Division

Different stages of Plan Preparation		Comprehensive Plan	Detailed Plan
I M P L E M E N T A T I O N		The setting of Priorities for Annual development activities as forecasted in the Comprehensive and Detailed Plans by the Municipality with the Technical cooperation of the Deputy of the DPUD in the Province with separation of the activities that are carried out by the Municipality or other organisations and recommendation of this after approval by the City Council to the Provincial Planning Council for the necessary implementation work and the carrying out of all coordination and notification of the implementation programmes that have been approved to all relevant organisations through the Governor of the Province and the forwarding of a set of programme copy to the Municipality	
S U P E R V I S I O N		(1) The preparation of a report on the development programmes in relation to the Comprehensive and Detailed Plans by the DPUD and the cooperation of the Municipality of the area and the outlining of problems or inefficiencies named specifically and informing the relevant organisation in the Provincial Council and if necessary to send representatives for the investigation of the issue. (2) The convening of a session of the Provincial Planning Council in order to be informed of problems and adoption of strategies for solving of such difficulties and the subsequent dispatching of the memos of the Directorate of the High Council of City Planning of Iran for information and adaption of necessary implementation strategies which are more appropriate in future planning programmes.	

Source: Urban Planning in Iran, MHUD 1982, pp82-88, own translation.

A9.1 Design of the Questionnaire

From the beginning when the whole idea of a field research with the use of a questionnaire was formed, a number of criteria were set to limit the scope of the survey and also the manner in which questions will be formulated.

These objectives were;

1. That the questionnaire should not exceed four pages,

2. That the questionnaire must be of 1 sheet on paper which would accomodate all the four pages, this was achieved by incorporating the duplication of the pages on both sides of A3 size paper,

3. That the questions should be in the simplest form possible and that it should take minimum possible time to be answered by the respondents.

4. That it should look informal to maximise the number of responses and minimise the suspicion of the respondents. This is of particular importance because the companies might have thought that the questionnaire was part of an official enquiry thus endangering their Tax liability.

5. The questionnaire should incorporate an element of both English and Persian languges. English was used for numbering, the address of the candidate, the name of the supervisor and the University. Thus a Persian version of the questionnaire was prepared.

6. The questionnaire must re-assure the respondent of the confidentiality of all the information disclosed in order not to jeopardise the company. To achieve this, it was mentioned that the respondants were not required to disclose thier names and addresses.

A9.2 Consultation with other people

Different people were consulted in the process of designing the questionnaire, these included a socialogist, a group of professionals, architects, planners and engineers, people who have had experience in preparation of various questionnaires and survey methods. The departmental computer expert was also consulted for advice on possible methods of data analysis.

A9.3 Testing the questionnaire;

Once the questionnaire was designed it was presented to a group of people with wide ranging experience for further discussion and criticism. As the result of these discussions a number of recommendations were made which the candidate found of particular use in improving the questionnaire.

A9.4 Nature of the Questions

The questions fall under six major headings with different number of variables mainly requiring a response in the form of a tick or in one instance the choice of Yes/No. At the end of each question there is an open space under the title of "others", left open for the respondent to fill if their answers differ to those appearing on the form.

The companies chosen for the survey were mainly of medium and small size which would generally be working on projects which were listed on the questionnaire. It is inevitable that it would be impossible to think of all types of work therefore blank spaces were left for addition of any other work.

Question ONE: Type of Company

The purpose of this question was to find out about the type of company in question. A possible list of different types of business was provided with additional space for "others, please specify"; the answer was to be given by making a tick in the sapce provided.

Question TWO: Company Specification

This particular question was for the purpose of obtaining information on the extent of company's experience, number of years in business, scale and grade of the company which is given by the Ministry of Plan & Budget.

Also it was decided to provide a formula by which the respondents could state the size of their company. The decision was made on the number of people employed by the company. Finally the respondents were asked to give the location of their company, city only.

Question THREE: Type of Projects

At an early stage because of the diversity of works it was decided to classify various projects under sub-headings, for example; Housing, Infra-structure etc totalling seven in all.

Also due to the fact that companies could have carried out different operations in the past the question included "in the past five years" at the same time limiting the scope of the responses. At the same time it was envisaged that the companies involved would most likely not be in a position to undertake projects of for example; (C) Civil Projects, and (F) Industrial projects as most of these projects are implemented by government ministries or as a joint venture with foreign companies or governments.

Question FOUR: Client

In order to obtain information on people involved in the development process in Iran it was obvious that a question had to be included which would give indications on the type of clients. The question clearly defines what is meant by the "client". the definition refers to the client as being either the "government" or one of its "agencies" which are at times confused as something different to the government or the private sector.

The companies with private sector clients are further asked to specify the nature of their client's business.

Question FIVE: Others involved

Specifically designed to obtain extra information about other people or bodies involved in the work of the company in question.

Question SIX: Problems and Solutions

From the candidate's point of view this was the most imporatnt part of the questionnaire which will assist in the recognition of the problems within the Iranian construction industry. The question was designed to briefly introduce the respondent to the objective of this particular question and also to give examples of some of the problems and possible solutions.

The respondent was asked to answer all the variables in the question and in order to get a more thoughtful response they are required to give a mark which would indicate the importance they attach to that problem or solution. This part of the questionnaire provided more space for respondents' opinions on other problems and solutions.

A9.5 Distribution of the Questionnaire

The survey involved the submission of the questionnaire to a number of companies mainly based in Khorasan province but also from other areas as far as Tehran and Tabriz on the north western province of Azarbaidjan. It was envisaged at first that the method of distribution of the questionnaire amongst the companies involved would be based on the visit of each company by the candidate. This became necessary once the candidate arrived in Iran. Through some discussions on the merits of the questionnaire with some experienced company directors who mentioned that because the companies do not come across such tasks and also to get a more useful reply, a level of personal representation would be paramount. It should be mentioned that the time during which the questionnire survey was carried out was the Iranian New Year (21st March). In order to create a more friendly response a personal greating card was designed by the candidate and was delivered a week before the questionnaire survey was to be undertaken. This proved to be of particular importance as the respondants already had a feeling that they knew the candidate. Each questionnaire was then taken to the companies and a few minutes were spent to explain the reason why it was necessary to carry out a survey and also to describe what is meant by each question. In half of the cases the questionnaire were left with the people and were collected after two days. The remainder of the questionnaires were filled in the same day in the candidate's presence. This method proved more useful because the respondants were giving a much more detailed comments on the problems and solutions parts and also were voluntarily giving recommendations on how in their opinion different issues can be tackled.

I am currently a research candidate on a Doctorate Programme in the U.K. In my research I study the nature of the Iranian construction industry the way it operates but more specifically the difficulties experienced by the private contractors.

This questionnaire is designed to help me obtain information about my research through the assistance of professionals involved in the industry. Your company has been selected as one to whom this questionnaire should be presented because of your wide experience in the construction sector. I therefore respectfully ask for your assistance in giving a constructive response to all the questions.

You are not required to give your name or the name of your company. Any information given will be treated in strict confidence.

By filling in this questionnaire, you make valuble contribution to my research. I look forward to your answers and comments and I thank you for your assistance.

With respect,

Ali PARSA

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COMPANY NO	

Please give your responses by making a tick or filling the appropriate space at the end of each section.

1: TYPE OF COMPANY	
a. Contractor	
b. Developer	
c. Developer & Contractor	
d. Consultant	
e. Mat producer	
f. Distributor	
g. Others please specify	

2:Company Specification:

i. Years in operation	
j. Grade	
k. Size (No of employees)	
less than 10	
between 10-50	
more than 50	
l. Location (city/region)	

3: Type of projects that your company has been involved in the past five years and is currently working on. Please tick as many boxes as appropriate.

[A] HOUSING	
1. Gvt Mass Housing	
2. Speculative (large)	
3. Small Private --	
4. Owner Built --	
[B] INFRA-STRUCTURAL	
5. Water supply	
6. Gas supply	
7. Elect-supply	
8. Sewerage	
9. Streets	
[C] CIVIL PROJECTS	
10. Ports	
11. Airports	
12. Roads	
13. Bridges	
14. Railways	
15. Power & Distribution	
16. Dams	
17. Irrigation	
[D] SERVICES	
18. Schools	
19. High schools	
20. Nursery	
21. University	
22. Mosque	
23. Hospital	
24. Clinic	
25. Sanatorium	
26. Government offices	
27. Commercial --	
28. Office buildings	
29. Hotels	
31. others	
[E] RECREATIONAL	
32. Parks	
33. Clubs	
34. Stadia	
35. Sports Hall	
36. others	
[F] INDUSTRIAL	
37. Warehouse	
38. Factories	
39. Oil Related	
40. Installations	
41. Pipelines	
[G] MILITARY & SECURITY	
42. Air-base	
43. Naval-base	
44. Army-base	
45. Accomodation	
46. others	
Others please specify	

4:WHO ARE/WERE THE CLIENT? The Government or one of its agencies such as a Foundation (if so please see Left Hand Side) or you work for the Private Sector (see the Right Hand Side). Please tick appropriate boxes.

[A]

1. Government	
2. National	
Name of Ministry	
3. Local	
Name of Department	
4. Para-statal Agency	
Name of Agency	
Location	
5. Others (please specify)	

[B]

1. Private Sector	
2. Company	
a. Large	
b. Medium	
c. Small	
3. Type of Business please specify	
4. Recently Nationalised? Yes/ no	
5. Others (plese specify)	

5:OTHERS INVOLVED: Please answer by a tick to show which of the following is involved with your work outside your company.

a. Design	
b. Construction	
c. Financing	
d. Supervision	
e. Other (please specify)	

Please for completion of the last section of this questionnaire turn to the next page.

6: PROBLEMS AND SOLUTIONS: Many of the problems which exist in the counstruction industry in our country can be solved. A number of problems and a series of possible solutions are listed. Which one/more of these do you agree with? You can mark your answers by a grade of 1 to 5 in order of importance, 1 being the lowest and 5 the highest.

[A] TYPE OF PROBLEMS	
SHORTAGE OF;	
1. Materials	
2. Equipment	
3. Unskilled worker	
4. Semi-Skilled --	
5. Skilled --	
6. Credit facilities	
7. Gvt investment	
8. Other problems please specify	

[B] SOLUTIONS	
WITH BETTER;	
1.Distribution	
2.Production	
3. Training by;	
a.Government-schools	
b.Traditional-training(apprentice)	
More;	
4. Investment	
5. Loans (credit)	
6. Legislation on;	
a. companies	
b. Labour Law	
7. Other problems please specify	

۵: مشکلات و راه حلها : بسیاری از مشکلات گریبانگیر صنعت ساختمان در کشورها قابل هستند. برخی از این مشکلات و راه حلهای آنها در ذیل عرضه شده است. لطفاً با دادن شماره از یک تا پنج به هر مورد، نظر خود را نسبت به درجهٔ اهمیت هریک از آنها مشخص کنید. (شمارهٔ ۵ بیشترین و شمارهٔ ۱ کمترین اهمیت را داراست.)

[A] مشکلات :	
کمبود :	
1. مصالح	
2. لوازم و ماشین آلات	
3. کارگر ماهر	
4. کارگر نیمه ماهر	
5. کارگر ساده	
6. تسهیلات اعتباری	
7. کمبود سرمایه گذاری دولتی	
8. مشکلات دیگر : لطفاً مشخص نمایید.	

[B] راه حلها :	
با بهبود :	
1. توزیع مصالح	
تولید لوازم	
2. تربیت نیروی انسانی :	
a. طریق آموزش منظم (مدارس حرفه ای)	
b. طریق آموزش سنتی (استادشاگردی)	
با ازدیاد :	
3. سرمایه گذاری	
4. وام	
5. با وضع قوانین مناسب :	
a. قانون شرکتها	
b. قانون کار	
6. راه حلهای دیگر. لطفاً مشخص نمایید.	

4: صاحبکاران فعلی وقبلی : کارفرما دراین سئوال دولت ، یا یکی ازبنیادها وسازمانهای تابعهٔ آن ویا کلاً بخش خصوصی است . لطفاً پاسخ خودرا با گذاشتن علامت (✓) درفضای پیش بینی شده وذکرنام وزارتخانه ویا بنیاد ویا سازمان مشخص کنید .

[A]

1. دولتی	
2. درسطح کشور نام وزارتخانه	
3. درسطح استان نام اداره کل	
4. بنیادها یا سازمانها نام بنیاد یا سازمان مکان	
5. غیره ، لطفاً مشخص نمائید	

[B]

1. خصوصی	
2. شرکت خصوصی	
a. بزرگ	
b. متوسط	
c. کوچک	
3. نوع کارشخص یا شرکت کارفرما (لطفاً مشخص نمائید.)	
4. شرکت ملّی شده	
5. غیره . لطفاً مشخص نمائید.	

5: دیگران : سایرشرکتها یا افرادی که دراجرای پروژه همکاری دارند. لطفاً پاسخ خودرا با گذاشتن علامت (✓) درمحل تعیین شده مشخص نمائید .

a. طراحی	
a. ساختمان	
c. امورمالی	
d. نظارت	
e. غیره . لطفاً مشخص نمائید .	

برای پاسخ دادن به قسمت آخر پرسشنامه لطفاً به صفحهٔ بعد رجوع نمائید .

3: نوع پروژه : لطفاً نوع پروژه و کارهائی را که شرکت شما در ۵ سال گذشته اجرا کرده و یا در حال اجرا است با علامت (✓) در فضای تعیین شده مشخص نمائید .

[A]	پروژه های مسکونی :	
1.	مجتمع مسکونی دولتی	
2.	مجتمع مسکونی خصوصی	
3.	مسکونی خصوصی (کمتر از ۱۰ واحد)	
4.	خانه شخصی (تک واحدی)	
[B]	تأسیسات زیربنائی :	
5.	شبکه آب	
6.	شبکه گاز	
7.	شبکه برق	
8.	کانال کشی فاضلاب	
9.	احداث خیابان	
[C]	تأسیسات عمرانی :	
10.	تأسیسات بندری	
11.	فرودگاه	
12.	راهسازی	
13.	پل	
14.	راه آهن	
15.	شبکه نشاردوی	
16.	سدسازی	
17.	کانال کشی آب	
[D]	خدمات :	
18.	مدارس	
19.	دبیرستان	
20.	کودکستان	
21.	دانشگاه	
22.	مسجد	
23.	بیمارستان	
24.	درمانگاه	
25.	آسایشگاه	
26.	ادارات دولتی	
27.	ساختمانهای تجاری	
28.	ساختمانهای اداری	
29.	هتل	
31.	غیره	
[E]	تأسیسات تفریحی :	
32.	پارک	
33.	ناستگاه	
34.	استادیوم	
35.	سالن ورزشی	
36.	غیره	
[F]	تأسیسات صنعتی :	
37.	انبار	
38.	کارخانه	
39.	تاسیسات نفتی	
40.	خطوط لوله	
41.	غیره	
[G]	تأسیسات نظامی و انتظامی :	
42.	پایگاه هوائی	
43.	پایگاه دریائی	
44.	پایگاه زمینی	
45.	خوابگاه	
46.	غیره	

غیره : لطفاً مشخص نمائید.

SERIAL NO	

لطفاً با گذاشتن علامت (✓) در محل تعیین شده پاسخ دهید.

1: نوع شرکت	
a. پیمانکار	
b.	
c. پیمانکار و	
d. تولید مصالح	
e. پخش مصالح	
f. مشاور	
g. غیره	

2: مشخصات شرکت :

i.	سابقه کار	
j.	درجه بندی ورتبه	
k.	تعداد کارکنان	
	کمتر از ۱۰ نفر	
	بین ۱۰ تا ۵۰ نفر	
	بیش از ۵۰ نفر	
l.	محل شرکت (شهر)	

ایجانب دانشجوی دکترای شهرسازی در کشور انگلیس هستم و موضوع رساله ام تحقیق درباره کیفیت و کاربرد صنعت ساختمان ایران، بخصوص مشکلات پیمانکاران بخش خصوصی است. منظور از طرح این پرسشنامه آن بوده که اطلاعات لازم برای رساله از طریق کمک دست اندرکاران صنعت ساختمان کسب شود. مبنای انتخاب شرکت شما سابقه ممتد و تجربه وسیعتان در بخش ساختمان بوده است. ذکر نام شرکت یا نام مدیر عامل ضروری نیست و کلیهٔ اطلاعات مندرج در این پرسشنامه خصوصی تلقی میشود. با پر کردن این پرسشنامه شما کمک ارزشمندی به انجام تحقیقات مورد نظر خواهید کرد.

من صمیمانه از همکاری شما در پاسخ دادن به سوالات و ارائهٔ اظهار نظر درباره آنها قدردانی می کنم.

با احترام، علی پارسا

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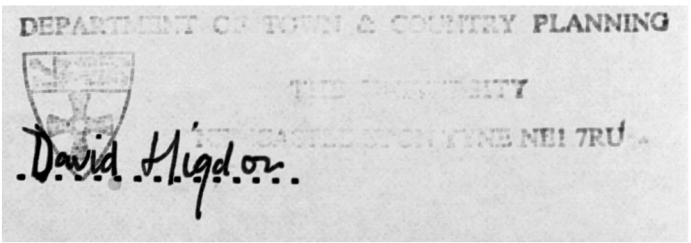

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