IMPACTS OF MODERNISATION & URBANISATION IN BANGKOK:

Anuchat Poungsomlee and Helen Ross

A joint research project between

Institute for Population and Social Research
Mahidol University, Thailand
&
Centre for Resource and Environmental Studies
Australian National University, Australia

Joint sponsored by
UNESCO's Man and the Biosphere Project,
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FOREWORD

On behalf of Mahidol University, I would like to convey my congratulations on the success of this first part of the Institute for Population and Social Research joint research project on Impacts of Modernisation and Urbanisation in Bangkok : An Integrative Ecological and Biosocial Study.

Environmental and development problems that the country and its people are encountering presently are severe and have reached a critical stage. In solving or reducing such problems, every sector of society shares in the responsibility. We are aware that Mahidol University, as part of this society, has an important role in helping to alleviate such problems. Mahidol has, as one of its most important university's policy, to support and encourage academic research in the areas of the environment.

This research report represents a significant contribution to univesity policy. I commend this document to those concerns and hope that it would motivate further discussion and participation in the problem solving processes.

Professor Pradit Chareonthaitawee
The President of Mahidol University

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ACRONYMS AND ABBREVIATIONS

BMA	Bangkok Metropolitan Administration
BOD	biochemical oxygen demand (measure of water quality)
DIW	Department of Industrial Works (Thailand)
DO	dissolved oxygen (measure of water quality)
JICA	Japan International Cooperation Agency
km	kilometres
LPG	liquid petroleum gas
MAB	Man and the Biosphere Program (UNESCO)
NESDB	National Economic and Social Development Board (Thailand)
NGO	non-government organisation
NIC	Newly Industrialising Country
NSO	National Statistical Office (Thailand)
OECD	Organisation for Economic Cooperation and Development
OTCP	Office of Town and Country Planning (Thailand)
SPM	suspended particulate matter (in air)
TDRI	Thailand Development Research Institute
TURA	Thailand University Research Associates
UNESCO	United Nations Educational and Scientific Organisation
WHO	World Health Organisation

PREFACE

This is the preliminary report of the research project Impacts of Modernisation and Urbanisation in Bangkok: An Integrative Ecological and Biosocial Study.

The project was initiated to provide an integrative assessment of the ecological and social impacts of modernisation and urbanisation in Bangkok, in the context of Thailand's national development strategies. Although many studies have been carried out concerning particular aspects of the impacts of modernisation and urbanisation in Bangkok, such as traffic and water pollution, no holistic picture is available. What is known is biased towards the inner city and riverside areas, where the monitoring of pollution and traffic is concentrated, and inconvenience to businesses and higher income groups is worst. The information is not generally analysed in terms which link the environmental problems explicitly to the nature of government, the economy, or human behaviour. The implications of environmental problems for the health and quality of life of the city's population also need to be considered more explicitly. Furthermore, as people adapt to the environmental problems they experience, by moving house, or changing their mode of transport, they cause major changes in land use and local population distributions which alter the environmental conditions again.

This report describes the research design and reports on the first stage of data collection conducted in 1989-1990, and analysed in 1991. The main part of the study commenced early in 1992.

ACKNOWLEDGMENTS

The authors wish to thank the other members of the research project team, especially Suwattana Thadaniti (Department of Urban and Regional Planning, Chulalongkorn University) Aphichart Chamratrithirong and Krittaya Archavanitkul (Institute for Population and Social Research, Mahidol University) and Stephen Boyden (Centre for Resource and Environmental Studies, Australian National University) for their participation in the design of this part of the project.

We also thank John Celicia, of UNESCO's Man and the Biosphere Program, whose advice and consistent support has enabled this project to proceed against considerable odds. Timely financial support from the Australian International Development Bureau, through Steve Wood, and the Centre for Resource and Environmental Studies, has also been essential in this initial phase. This publication has been funded by the Man and the Biosphere Program, and the Institute for Population and Social Research, Mahidol University.

Numerous staff of government and non-government organisations in Thailand, particularly the National Environment Board, have been helpful in providing information. We are indebted to the members of the seven urban communities which participated so willingly in this study.

Sureeporn Punpuing, Tony Jakeman and John Taylor of the Centre for Resource and Environmental Studies have assisted with the checking of details towards this report, and Ettie Oakman has provided invaluable support with the preparation of the manuscript.

INTRODUCTION

This study has been inspired by the ongoing debate among Thai scholars, politicians, administrators and the public as to whether the path of modernisation followed by Thailand historically and currently is appropriate to ensure the health and well-being of Thai people and of the natural environment on which they depend. The course of this debate has suffered from a lack of adequate data. The debate has parallels worldwide, as people in developed and developing countries alike are questioning the wisdom of forms of development which are unsustainable ecologically and which have potentially negative effects on human health and well-being.

Urbanisation, including the uncontrolled growth of Bangkok, is an important aspect and consequence of this path of modernisation. The city has been developed as the sole centre for government and national administration, economic activities, industrialisation, telecommunications, social services and public welfare. Most manufacturing is clustered in and around the city (Krongkaew and Tongudai 1984). London (1980) argues that the growing primacy of Bangkok is integral to the exploitation and neglect of the rural hinterland. This uneven development between Bangkok and rural areas has been fostered by minority elite groups through the deep rooted patronage system.

Bangkok dominates Thailand's urban hierarchy with a population (5.7 million in 1988) which is about 50 times larger than the second largest city (Pitaksilpa 1988). It is estimated that in 2001 Bangkok will have about 8 million people. This overcrowded city suffers severely from many environmental and social problems - traffic congestion, air pollution, noise, inadequate water supply, water pollution, flooding, a poor garbage disposal system, slums, rapidly rising cost of living, and a growing gap between rich and poor. The city has grown far beyond its optimum size and its population is also responsible for wasteful energy consumption. The city's site on a flood plain, and the lack of an effective urban planning system, exacerbate the problems and make solutions difficult.

A number of studies have analysed aspects of Bangkok's urbanisation (see for example London 1980, Wongtrangan 1982, Korff 1983, Krongkaew and Tongudai 1984, National Economic and Social Development Board - NESDB - 1986, Thadaniti 1987, Komin 1989). However, there is still a lack of substantive information on resource usage and the environmental quality of the city. The impacts of the growing city and of environmental problems on its inhabitants, and how people adapt or adjust to the changing environment, have not been studied.

The growth and transformation of Bangkok has been inextricably linked with Thailand's modernisation policies, dating from King Rama IV's decision in 1855 to embrace modernisation and open the country to the western world. This initiated Bangkok's national and international role, influencing later growth patterns. The government's modernisation policies of the 1960's focused on the provision of infrastructure, particularly roads, leaving the precise forms of economic development to private sector initiative (Demaine 1986). This has promoted an urbanisation sequence in which new roads lead to land speculation and land use changes, building booms, population inflow, former population outflow and service enterprises. The lack of effective service town planning controls has increased the seriousness of the social and environmental impacts of this sequence.

The economic and social dimensions of modernisation, equated by Thais largely with westernisation (Komin 1989), have contributed to urban growth and transformation by the exchange of water transport for road transport (increasing flooding, congestion and air polllution). Growing divisions between rich and poor are leading to differential access to land, housing, and transport. The modernisation of political and administrative systems has imitated western forms while retaining the strong hierarchical and patronage aspects of Thai

culture in performing functions (Komin 1989). The combined effect is a form of 'planning' by omission and economic influence, with little practical control over the development of the city. There is little acceptance of public participation in planning, except for the role of NGOs and slum dwellers in slum redevelopment.

People's adaptations to existing conditions (and anticipations of them worsening) have the cumulative effect of transforming the city in unintended ways, creating new problems and undermining the government's solutions. For example, middle class people move to the green belt to escape air pollution, adding to traffic flows, and displacing farmers and poorer people as land is taken up for housing estates. The burdens of displacement and worsening conditions fall very inequitably on poorer people. It is therefore crucial to understand people's perceptions and the rationale for their behaviour. People also adapt in ways which impact on their own well-being. They may internalise stresses, or adopt behavioural strategies such as spending long hours away from home to avoid peak traffic.

There is a wide gap between government decision-makers' assumptions about the functioning of Bangkok, and hence the types of planning interventions which are considered appropriate, and the inhabitants' experiences and actions. Government organisations usually focus on single issues, such as traffic or river pollution, and take a piecemeal approach to solutions. These have generally concentrated on engineering solutions such as traffic flyovers, and occasionally on administrative actions such as improved policing. There is insufficient anticipation of environmental problems, little attention to the ways in which people's and organisations' behaviour contribute to problems, and a lack of an integrated view.

Bangkok's urbanisation is largely a societal phenomenon, so remedial action also needs to be societal. Urban research needs to take political and other cultural and institutional factors firmly into account. Purely technical solutions will be ineffective. Institutional and cultural factors appear to make comprehensive city planning on the western model impossible (several plans have been drawn up over the last 25 years, but could not be implemented). The city is administered at inappropriate levels of government: central government carries responsibility for many urban services (through state enterprises) which would elsewhere be handled by city or more localised authorities, and there is a severe lack of coordination. This is highly inefficient, and unresponsive to the needs of the people. Recent improvements in the effectiveness of the Bangkok Metropolitan Authority are promising, yet this body has few funds and powers. Neighbourhood and district planning, and local participation, need to be explored as supplements and alternatives to the current system. Despite cultural reticence, urban communities have the capacity and willingness to contribute to solutions. They do a lot to improve their environments, through community projects such as paving, electricity installation, and flood control.

This report covers the first stage of an integrative research project based on a dynamic view of the city as a people-environment system. The research seeks to improve on current segmented approaches to the academic study of urban problems and urban planning. We hope its outcomes will encourage a more social and less technical approach to planning and problem-solving, incorporating participative decision-making. The study should reinforce national planning trends to consider human and environmental well-being alongside economic growth indicators.

THE RESEARCH PROJECT

The research project extends a series of ecological approaches to the study of urban systems encouraged by Stearns and Montag (1974) and UNESCO's Man and the Biosphere (MAB) program under its Project Area 11 - integrated ecological studies on human settlements (UNESCO 1973, 1975; Spooner 1986). The Human Ecology Group at the Australian National University (which joined the Centre for Resource and Environmental Studies) conducted major studies in Hong Kong (Boyden et al 1981) and Lae in Papua New Guinea

(Jeffries 1979; Dalton 1979; Christie 1980; Newcombe et al. 1980), following theory developed by Boyden (1987) concerning the interplay between biological cultural processes in the development of human society. A study sponsored by MAB was carried out in suburban northern Bangkok (Piyakarnchana 1986). International conferences have assisted the exchange of methodologies and results in this evolving field (Center for International Project 1988; Chinese MAB Committee 1989).

This project continues the development of conceptual and methodological frameworks pioneered by Boyden and colleagues (Boyden 1979, 1987). The basis of the framework, and the methods used by this study, are described in appendix 1.

Objectives

The broad objectives of the study are:

1. To study the impacts of modernisation and urbanisation on the human population and the biophysical environment in Bangkok, applying an integrative ecological and biosocial methodology (see appendix 1 for explanation of terms).

2. To examine the changing interrelationships resulting from urbanisation, between

   - the biophysical environment (e.g. air and water quality, the built environment);
   - the human population (e.g. health and disease patterns, quality of life);
   - societal activities (e.g. industrial processes, farming, transportation); and
   - societal arrangements (e.g. economic policies, planning processes, non-governmental movements).

3. To develop an integrative framework and methodology that can be applied in future environmental management and policy-making. This framework and methodology will take account of:

   - the sensitivities of the biological environment and food-producing ecosystems;
   - the health and quality of life of individual human beings; and
   - the ecological constraints on the ultimate scale and kind of societal activities.

4. To explore societal processes through which changes might be brought about, leading to improvements in terms of both ecological sustainability and human health.

Research Questions

Because the research is exploratory, it has been organised around research questions rather than hypotheses. We are interested in the following questions:

1. How are modernisation and urbanisation related in Thailand's development?

2. What key processes operate in Bangkok's urbanisation?

   - how do neighbourhoods and the agricultural periphery transform?
   - what roles do institutional and cultural arrangements play in these processes?

3. What is the impact of these processes on the environment and land uses (including housing, commercial areas, agricultural areas)?

4. What are the impacts on people?

   - their physical and mental health (including stress);
   - their behaviour patterns;
   - their personal environments (family and community well-being).

5. How do people adapt?

   - by moving to other environments? (e.g. another part of Bangkok);
   - by physically altering their present environment? (e.g. installing air conditioning, organising a community clean-up);
   - by altering their behaviour? (e.g. staying at work for extraordinary hours to avoid traffic);
   - by altering their thinking? (e.g. deciding not to worry).

6. What effects do these adaptations have, individually and collectively?

   - on the continuing transformation of the city
   - on their personal and local environments
   - on their own well-being

7. How are urban problems inter-related?

   - how does treatment of one problem, or failure to treat it, affect other problems?

8. What are the implications for

   - analysis of urban problems?
   - planning and decision-making?

9. What culturally feasible opportunities are there to improve the situation?

   - what opportunities can the people themselves take, or can be opened up for them?
   - what opportunities are there for governmental change?

Study stages

The research project has a number of components. The first of these, the preliminary (exploratory) study is the subject of this report.

1. The research design and exploratory research. This includes a literature review, collection of statistical background data and focus group interviews in a selection of urban communities on the rapidly expanding western side of Bangkok (details of the focus group method are given in chapter 3, and of the research design in appendix 1).

2. Biophysical studies: a historical analysis of urban growth patterns and contemporary land uses, including their societal influences; a biophysical field survey of environmental conditions, and a Geographic Information Systems examination of environmental quality in different parts of the city.

3. Human conditions and behaviour: a 'life conditions' survey designed to find out the behaviour patterns and well-being of a representative sample of Bangkok's population.

4. Environmental policy and management: semi-structured 'key informant' interviews with officials charged with the management of aspects of the city, and public interest groups which take an interest in environmental and human issues. These are designed to elicit unpublished information and managers' perspectives on the management of the city, and to explore the feasibility of new policy options.

5. Public participation: from decision-makers through a policy advisory committee and the key informant interviews, and from communities through the first and a second round of focus group interviews designed to assess policy options and motivate public action. Both sectors will be invited to participate in public workshops on completion of the study.

6. Integration of results, development of refined theoretical models and presentation of recommendations.

The second to fourth components will proceed concurrently, and the fifth will continue throughout the study.

The project design and data collection processes have been designed to require continual interaction between the collaborators, based in the Centre for Resource and Environmental Studies, Chulalongkorn University and Mahidol University.

Initial planning of the project commenced at the Centre for Resource and Environmental Studies in April 1988, at the instigation of Anuchat Poungsomlee of Mahidol University who wanted to conduct his PhD studies as part of a more ambitious project. Collaborators were arranged in November 1988, during a visit to Bangkok by Helen Ross, Anuchat Poungsomlee and Stephen Boyden. Fund raising took from 1989 to late 1991, during which the detailed design of the project also proceeded and Mr Poungsomlee conducted the first stage of the project. The background data was collected and fieldwork conducted in 1989 and 1990, and written up in 1991. The literature and statistics reported in chapter 2 may no longer be the most recent available; updating of secondary data will await further stages of the study.

At the time of writing, the main stages of the research project are due to commence. The collaborators met to refine the research design and continue drafting the life conditions survey in February 1992. The commencement of data collection has been interrupted by the political crisis of April to June 1992, and particularly the violence of 18-19 May which traumatised Bangkok. This turning point highlights the discrepancies between political and economic 'modernisation'in Thailand. The effects on the main theme of this study, the impacts of modernisation on urbanisation, and thence on the well-being of the environment and the people of Bangkok, remain to be seen.

MODERNISATION, URBANISATION AND ENVIRONMENTAL CONDITIONS

THE EARLY SETTLEMENT OF BANGKOK

Thonburi, on the western side of the Chao Phraya River was established as the new capital of Thailand in 1767 after the destruction of the previous capital, Ayutthaya, by the Burmese. This administration lasted for only 15 years, and in 1782 the capital city was moved across the river to Bangkok where it was less vulnerable to outside attacks. The majority of people settled on the east bank of the river, although some stayed on the western side in the narrow strips along canals passing through orchards (Nathalang 1986: 44).

The settlement was established on a fertile floodplain, very well suited to agriculture. Rice dominated national agricultural production, with about 95 per cent of cultivated land being devoted to this purpose nationally (Ingram 1955:9). The many natural and constructed waterways provided transportation for people and goods, as well as draining the low-lying land. People lived along the river and canals, and built traditional Thai houses in which living areas were raised above the flood levels. The ecological system based on the floodplain and waterways thus formed the basis of the economic and cultural system, in an apparently balanced 'human ecology'.

Suvanamas (1982) divides the city's development into five major periods: the capital and fortified city (1782-1809); the old city (1809-1851); the commercial city (1851-1868); the pre-industrial city (1868-1946); and the primate city (1946-present). Bangkok was initially a very small community, settled in an area of only about 3.5 sq km. During the 19th century, the city was still confined within the city wall. It was also divided into two sections by inner and outer klongs (canals), which served like ring roads. The palace was located in the inner area, while the residential parts and the paddy fields were in the outer areas (Bongsadadt 1987: 548).

It was not until the second half of the 19th century that Bangkok began to change rapidly. In response to the policy of modernisation and westernisation, the land transportation network was progressively extended to Bangkok's suburban areas and water transportation began to decline. A multi-centred urban structure developed, with the Palace and a surrounding complex of temples and monasteries as cultural focal point, and later an extended 'central business district' (in reality a series of commercial foci interspersed among residential areas).

MODERNISATION

Thailand's economy and society were transformed by western influence following the conclusion of the Bowring Treaty with Britain in 1855. This Treaty improved trading conditions for the British (Ingram 1955: 34; Keyes 1987: 44). It set a pattern which was soon followed by treaties with many countries such as United States, France, Denmark, Germany, Sweden, Spain, Japan and Russia.

The major impact of the Bowring Treaty was that it integrated the Thai economy into the world economy through international trading relations. Thailand subsequently underwent rapid commercialisation with increased specialisation in the export of rice. Natural resources and raw materials such as teak, tin and rubber were increasingly utilised for the support of an export-oriented economy. However, many home-market industries, such as textiles, declined at the same time because of competition with imported products. This

development resulted in greater dependence on international trade and monetary exchange values. Moreover, the imports of consumer goods were luxuries rather than basic necessities (Ingram 1955: 131).

Major reforms in the name of modernisation were made to Thailand's political and administrative system during the period 1868-1925 (the Fifth and the Sixth Reigns). These reforms were perceived by the rulers as essential to counter the threat of colonisation at the time. The reform programs, referred to as part of a nation-building policy, involved the centralisation of the political and administrative systems, with a consolidation of power in the monarchy (Dhiravegin 1983b: 47). The judicial system, based on the western model, was brought under the control of Bangkok rather than the provinces. The military forces were reorganised, and the various ethnic groups assimilated into the Thai nation-state through educational reform or popular political and cultural socialisation (Dhiravegin 1983b: 48-51).

The government also developed infrastructure through projects including railroad building, surveys and mapping, and the introduction of telegraph communication. In order to lay the foundations for education, all schools throughout the country taught the same national language, the same national history, and children learnt the same national song. Buddhism and programs of education in particular were modified to promote Thai nationalism, especially during the Sixth Reign (1910-1925). This nationalist policy was perceived as the foundation for the country's modernisation process.

Although Thailand successfully avoided becoming the colony of any western country, a colonial-style economy and society were imposed by the rulers themselves as the Thai response to outside influences. Girling (1981: 62) discusses the three consequences of this imposition. The first was the transformation of feudally encumbered peasants into independent owner-cultivators, producing rice and raw materials for export. The second was the spread of the Chinese entrepreneurial sector, and the third was increased revenues derived from improved administrative methods which made possible the strengthening of the Thai state and a great increase in its population.

The development of the Thai economic and social system has accentuated differences between the urban and rural sectors, resulting in a dual system. This became evident in the early 20th century. While in the rural areas people still pursued traditional agricultural activities, the urban sector developed in other directions, concentrating on industrialisation and commercialisation. These divergent paths of development also involved differentiation of the culture and way of life of people in the urban and rural areas.

Modernisation of the political system began with a revolution in June 1932 by a group consisting of young army officers, unemployed foreign-educated youth and some older moderates (SarDesai 1989: 173). This brought about a change from absolute monarchy to a constitutional parliamentary system. This change marked a new era not only in the Thai polity but also in the economic and social system as well.

A major change in economic and political policies in Thailand occurred at the end of 1938 when Field Marshal Plaek took power and became Prime Minister. It was during this period that a policy of nationalism was implemented. Like the policy of the Fifth and the Sixth Reigns, this again was perceived as a modernisation process. Under the policy of economic nationalism, which was controlled mainly by military people in Cabinet, the Prime Minister exercised his powers to build a new nation. The nation-building policy discriminated directly against the Chinese who at that time had a significant role in the Thai economy. These policies also impinged on Thai culture. Twelve Cultural Mandates were issued, aimed at uplifting the spirit and moral code of the nation and instilling new practices into Thai life (Wyatt 1984: 255). The western calendar was adopted, and the policy required Thais to salute the flag, know the national anthem, and use the national language rather than local dialects. People were encouraged to buy only Thai products, to dress in modern (western) fashion - men in coats, trousers, shirt, and tie; women in skirts,

blouses, hat, and gloves; and all in shoes - and to wear hats when entering government offices. A husband was supposed to kiss his wife before going to work. The policies were seen as necessary for progress and civilization so that the world would see Thailand as a modern nation (Wyatt 1984: 255). The name of the country was changed from Siam to Thailand in 1939.

After World War Two the Thai economy changed again, as European expansion brought new concepts of western development. Farmers changed their mode of production to new cash crops and the 'green revolution' was introduced to stimulate a new agricultural plantation system. Thus the Thai economic system was progressively transformed from a relatively closed self-sufficient economy to a more open one which emphasised specialisation and division of labour. Thai economic development proceeded through the promotion of industrialisation and economic growth, based on models of western capitalism. Political power involved tight control by the bureaucratic system. Thus economically and politically, a system of so-called bureaucratic capitalists was created.

The interpretation and modification of the concept of modernisation, in response to western influence, has had a deep impact upon the present development pathway. The way in which it has been used, under the name of progress and development, is in essence simply westernisation. These processes have been referred to as 'modernisation without development' (Jacobs 1971). Jacobs argues that development, defined as 'the maximisation of the potential of the society', barely took place in Thailand during the periods of modernisation before and after World War Two. The fundamental problems of the country were scarcely addressed. Jacobs assesses that many so-called development projects, such as improving the infrastructure and reforming the administrative structure, have been introduced merely to satisfy the interests of the authorities and to maintain the system of patrimonialism.

Demaine (1986:112) agrees that misinformed attitudes and the misinterpretation of development by the Thai bureaucracy still influence national planning and its implementation. The deeply rooted system of patron-client relations reinforces the centralisation of power and the elite status of the government and its officials. These characteristics are the main impediment to the participation of ordinary people in development.

Meanwhile, the state of the environment has suffered seriously. McGee (1974) describes the progressive ecological deterioration, which he calls 'ecocide', in the countries of Southeast Asia during this period of modernisation in the early 20th century. He argues that western influences in this region, through the processes of colonialism and international trade, have had major impacts on the region's ecological diversity. Specialisation in production, mainly in agriculture, has interfered with the harmonious and balanced relationships between people and the environment.

CAUSES OF URBANISATION

The concept of 'urbanisation' has a number of dimensions, and is used differently in several academic disciplines. In demography the term refers to population factors, such as the extent to which national populations are concentrated in cities. In human geography and economics it is used to explain the spatial distribution of economic activities and human settlements, while in sociological studies the emphasis is on the different lifestyles in urban and rural sectors. The urbanisation process is also interpreted differently in western and developing countries. We use the concept in a multidimensional sense, to include the changes in and relationships between demographic patterns, economic activities and arrangements, as well as the social system and spatial arrangements of the city. Although this study emphasises the Bangkok ecosystem, the dynamic relationships between the city and its surrounding areas are regarded as very important, environmentally, economically, socially and culturally.

Thailand's historical policies of modernisation have resulted in growing urban concentration, owing to many factors related both to internal conditions and to the world economy. National Economic and Social Development Plans have also played a significant role in bringing about the increasing imbalance in the economy. The urban sector, in particular Bangkok, has developed and become the centre of the country's economy, while the rural sector has remained at the periphery.

Phipatseritham (1983) argues that at least three factors have contributed to the growth of Bangkok and its domination over other regions. These are the advantage of the geographical location of Bangkok, the concentration of economic activities, and the concentration of political and administration powers and social services (Phipatseritham 1983: 10).

Although the prime reason for establishing Bangkok as the capital city was defence, the location of the new capital in the Chao Phraya drainage basin was ideal for agricultural production and for carrying out trade with the outside world.

> *Bangkok can be compared to a hole at the bottom of a cone where all fluid has to pass through. The Chao Phraya River serves as the prime outlet for many parts of the country. Because Bangkok is situated almost at the mouth of the river, it plays a leading role in the process of interaction with the hinterland.*
> (Thai University Research Associates - TURA - 1976: 35)

Bangkok therefore developed as the centre of communication and focus of transportation of agricultural products. Railways, roads, highways, an international airport and port were built to facilitate the country's economic activities. After the Bowring Treaty of 1855 transformed the closed Thai system to a more open economy, most of the international trade (dominated by rice, rubber, teak and tin), was channelled through the port of Bangkok.

Economic conditions have affected urban concentration and unbalanced development. Phipatseritham (1983) identifies the main factors as economic development before the 1960s; the growth of Thai capitalism and business groups; transportation development; and the expansion of commercial banks. Capital development and accumulation through agricultural exports has been very slow as compared to that achieved by the commercial and financial sectors. As a consequence, most of the capital has been concentrated in Bangkok. The development of transportation during the last 20 to 30 years has also favoured the concentration of economic activities in Bangkok, as the transportation system directs trade and communication through Bangkok rather than within and between the regions. The commercial financial sector is also biased towards development projects in the city. Most manufacturing and other industrial activities remain clustered in and around Bangkok. In all respects, Bangkok has therefore become the only growth-centre of the country (Krongkaew and Tongudai 1984: 24-25).

The increasing centralisation of power in Bangkok applies to politics, government, economics, education and other aspects of social arrangements (Kambhu 1984: 81). Dhiravegin (1983a) argues that this system has been an obstacle to the decentralisation of power and has prevented the development of genuine local government. Instead of decentralisation of power, for example, the government has adopted a policy of deconcentration of power. As a consequence, the country's bureaucratic institutions expand uncontrollably. This feature of 'Bangkok-centrism' has had negative results for development, in both rural areas and cities. One of the most crucial consequences of this is the creation of an imbalance in development which has led to a wider gap between the poor and the rich (Dhiravegin 1983a: 10-19).

London (1980) argues that the growing primacy of Bangkok is responsible for the exploitation and neglect of the rural hinterland. The uneven levels of development between Bangkok and the countryside have been supported by a minority elite group through the patronage system.

Bangkok's urbanisation is consistent with that of other capitals in the region. McGee (1967) argues that the economic, political and social conditions underlying the Southeast Asian cities' growth were significantly different from those existing in urbanised and industrialised in Western Europe in the same period. Originally, the process of urbanisation in western countries developed out of industrialisation and technological development, accomplished within relatively stable nation states. However, the process of city growth in Southeast Asia emerged while the countries were still struggling to form nation states (McGee 1967: 171-172). The urbanisation process in Southeast Asia is due mainly to the massive increase of population, rather than to technological and industrial development (Boonperm 1986: 1; Pramuanratkarn 1979: 43). Although urban growth has lagged behind the development of industry, the degree of centralisation is very strong. The high concentration of both administration and political power, resulting in disparities between the modern urban sector and traditional rural areas, is a common feature among countries in the region.

The domination of a single metropolis, the so-called 'primate city', is also a common feature of urbanisation in Southeast Asia. The primate city is characterised by a rapidly increasing urban population resulting from migration. There is an urban hierarchy (McGee 1971: 97-98), related to the function of the city in accumulating capital at the different local, regional, national, and international levels. Armstrong and McGee (1985) describe Third World cities as 'theatres of accumulation'.

> *Cities, particularly the large metropolitan areas, act as the central places for a process leading to an increasing concentration of financial, commercial and industrial power and decision making. On the other hand, cities also play the role of diffusers of the lifestyles, customs, tastes, fashions and consumer habits of modern industrial society.* (Armstrong and McGee 1985: 41)

Since the urbanisation which has emerged in Bangkok is 'mainly as a consequence of the importation of western ways of living' (TURA 1976: 38), the city has become a focal place for the diffusion of imitative lifestyles and consumerism found in western society.

THE CONTEMPORARY THAI ECONOMY

The continuing modernisation of the contemporary Thai economy is characterised by a drive towards industrialisation and economic growth. Over the three decades since Thailand adopted economic and social development planning, economic growth has progressed at a remarkable rate. In the six development plans to date, the objectives have been economic growth, stability and, to a varying degree, social equity. Thai economic growth averaged over 7 per cent annually in real terms during the 1960s and 1970s, and has returned to that level following a decline in the first half of the 1980s owing to the international economic situation associated with the second oil crisis in 1979. Several factors contribute to the recent economic strength: the decline in oil prices since 1982; the devaluation and the floating of the baht in 1984; the international currency readjustment; the low interest rate since 1982 and the recovery of agricultural commodity prices (Tambunlertchai 1989: 93-94). The restructuring of the economy is reflected in the share of the agricultural sector in the gross domestic product, which dropped from 35 per cent in 1965 to 17 per cent in 1988, while that of the industrial sector increased from 23 per cent to 33 per cent and that of the service sector increased from 43 per cent to 51 per cent over the same period (Ashakul 1990: 10).

The strong performance of the Thai economy has drawn much discussion among economists, politicians, administrators, and the general public as to whether or not Thailand is poised to enter the ranks of Newly Industrialised Countries (NICs). However, critics point out that economic growth is not the only measure of development achievement. Other variables, such as income distribution, quality of life, and environmental deterioration need to be taken into account for evaluation of the development process.

The impressive growth of the economy has been associated with a widening of the gap between the rich and the poor, as well as between the urban and rural sectors. By 1985-86 the richest 20 per cent of the population received over 55 per cent of the country's total income while the poorest 20 per cent earnt less than 5 per cent (Hutaserani and Jitsuchon 1988: 16). There is a twelve-fold difference in income between the richest and the poorest 20 per cent of the population (Bhongmakapat 1990: 20).

Table 1 shows the overall incidence of poverty, in terms of the percentage of population with an income below the poverty line. In 1988 more than 25 per cent of the national population lived under the poverty line. More than 30 per cent of the rural population (all villages) and 5 per cent of the city population (all municipal areas) lived below the poverty line. Although the rate of poverty in the Bangkok Metropolitan Region has declined since 1975, the percentage of people below the poverty line remains relatively high among those who live in the suburban and fringe areas such as farmers, gardeners and slum dwellers.

Table 1 Percentage of population under poverty line

	1975/6	1980/1	1985/6	1988
Thailand	30.0	23.0	30.0	25.2
All villages	36.2	27.3	35.8	30.6
All sanitary districts	14.8	13.5	18.6	15.3
All municipal areas	12.5	7.5	5.9	4.8
Bangkok Metropolitan Region	7.8	3.9	3.5	-
BMR -city core	6.9	3.7	3.1	2.4
BMR -suburbs	6.0	2.6	2.5	1.6
BMR -fringes	12.0	9.2	8.8	6.3

	Poverty line: (baht per capita/year)	
	Rural	Urban
1975/76	1 981	2 961
1980/81	3 454	5 151
1985/86	3 823	5 834

Source: Huteserani and Jitsuchon (1988: 42 and 91).

The Bangkok economy

The gross domestic product of Bangkok and its vicinity compared to other regions (see table 2) shows that industrial production is highly concentrated in Bangkok, which in 1987 contributed about 64 per cent of the country's total industrial production. The service sector of the city represented nearly 50 per cent of the national total. In contrast, the agricultural sector contributed only about 10 per cent, as compared with 20 per cent in other regions. In 1984 more than 90 per cent of textiles and cloth, leather products, furniture, electrical appliances, toys and sporting gear came from Bangkok, which also contains 82 per cent of the jewel-cutting industry (Ashakul 1990: 13). Although the government has recently developed a policy aimed at controlling the number of factories in Bangkok, the number of new factories remains high. About a quarter of the 4,894 new factories approved in 1988 for the whole country were to be located in Bangkok (NESDB 1989a: 66).

Table 2 Gross Domestic Product at current market prices by region, 1987

value: Million baht

	Gross Domestic Product			Total	Per capita
	Agriculture	Industry	Services	GDP	
Northeastern	48 540 (24.4)	37 950 (7.2)	68 877 (13.4)	155 367 (12.7)	8 343
Northern	41 850 (21.1)	39 127 (7.5)	57 306 (11.1)	138 283 (11.3)	13 185
Southern	43 261 (21.8)	26 552 (5.1)	52 657 (10.3)	122 470 (9.9)	17 506
Eastern	17 738 (9.0)	41 962 (8.1)	40 797 (7.9)	100 497 (8.2)	31 094
Western	17 556 (8.9)	21 516 (4.1)	23 659 (4.6)	62 731 (5.1)	19 795
Central	10 124 (5.1)	20 149 (3.9)	19 243 (3.8)	45 516 (3.7)	18 742
Bangkok & vicinity	19 215 (9.7)	334 258 (64.1)	251 692 (48.9)	605 165 (49.1)	71 566
Thailand	198 284 (100.0)	521 515 (100.0)	514 231 (100.0)	1 234 030 (100.0)	23 021

Source: Calculated from NESDB (1990).

Note: Agriculture includes Crops, Livestock, Fisheries, Forestry, Agricultural Services, and Simple Agricultural Processing Products.
Industry includes Mining and Quarrying, Manufacturing, Construction, Electricity and Water Supply, and Transportation and Communication.
Services include Wholesale and Retail Trade, Banking, Insurance and Real Estate, Ownership of Dwellings, Public Administration and Defence, and Services.

The rates of unemployment of the Bangkok Metropolitan Area and the average for the whole country in 1987 were about the same, at 5.9 per cent. The rates of employment by economic sector in Bangkok for that year show a marked difference between the agricultural and industrial sectors. While the city's industrial sector had the highest rate of employment at 97 per cent, the agricultural sector's employment rate was among the lowest, at 3 per cent (NESDB 1989c: 32).

The major source of earnings for Bangkok households is from wages and salaries (49.7 per cent), non-money income such as the value of goods produced at home, income received as pay or received free from other sources (20 per cent), and non-farm profit (19 per cent - National Statistical Office 1988). The occupational characteristics of Bangkok households vary between the city core, the suburbs, and the fringe areas. Those who live in the city centre tend to work in the financial or commercial sectors, as company workers and administrative personnel, while those who live in the fringe areas rely basically on agriculture-oriented activities.

There are major income disparities within the city. The distribution of households by per capita monthly current income shows that about 3 per cent of Bangkok's population lived below the poverty line (5,834 baht per annum) in 1988. Ninety one per cent of the city population had a per capita monthly income of less than 5,000 baht. About 7.8 per cent had an income of between 5,000 and 10,000 baht per month, while only one per cent had a monthly income of over 10,000 baht (NSO 1989).

CONTROL OF URBAN DEVELOPMENT

Bangkok still does not have a general land use plan to guide the growth and expansion of the city, and many believe that it would be politically as well as practically impossible to implement one now. As a consequence, the city grows without effective controlling mechanisms. The first attempt to lay out a master plan for Bangkok was in 1960. The Greater Bangkok Plan 2533 (1990), prepared by the American consulting firm of Litchfield Whiting Browne and Associates, aimed to provide a framework for the physical development of the Bangkok Metropolitan Area. Although the plan was completed a few years before the country's first National Economic and Social Development Plan commenced, it has never been officially adopted (Romm 1972: 76-77). Sternstein (1971) describes this plan as:

> *Essentially a land use plan: blocks of different uses separated by access ways and coloured to produce a pleasant mosaic-like structure able to accommodate, comfortably, four and a half million people, attendant facilities and anticipated industrial growth in 1990.* (Sternstein 1971: 1)

Although the Litchfield Plan was not officially adopted, many of its specific proposals have been carried out with the help of American funding. The plan laid much emphasis on the development of infrastructure on a western model. Thus, many klongs (canals) were filled in and new roads were built, converting Bangkok into an 'automobile city' (Bongsadadt 1987: 554) and interfering with the water supply, drainage and flood control formerly provided by the klongs. To a certain extent, the plan can be perceived as part of an attempt to modernise and westernise the city (cf Sternstein 1971).

Ten years later the Litchfield plan was revised and published in the Report on the First Revision of the Plan for the Metropolitan Area (Sternstein 1976). In response to the very rapid changes occurring in the city, the population projection for 1990 was revised from 4.5 million to 6.5 million, and areas for non-agricultural use were expanded from 460 sq km to 732 sq km (Sternstein 1976).

Partial measures to guide urban development have been adopted at times, but have proved difficult to implement in practice. In an attempt to protect the agricultural areas surrounding the city from urban sprawl and the expansion of industrial and commercial activities, the government gave these areas legislative protection as a 'Green Belt' under Acts of 1975 and 1979. The legislation permits only a limited proportion of construction within the Green Belt zone, and this must be related to agricultural activities. The Green Belt policy is essentially preventative, and gives little positive recognition to the importance of maintaining the sources of urban agricultural production and a green environment for environmental, social and public health reasons. This leads to arguments over land use in the fringe areas (Karnchanapant 1989) because many government agencies, industrial investors and land developers believe that the Green Belt policy is the major obstacle to the city's economic development, and want the law re-evaluated. The allocation of land uses between urban and agricultural functions therefore remains unresolved. Meanwhile, so many developers are able to circumvent the legislation that the green spaces are disappearing rapidly.

None of the major attempts at land use planning has had a significant impact on land use control in Bangkok. At present, the Office of Town and Country Planning (OTCP) is preparing a new Comprehensive Master Plan of the Bangkok Metropolitan Area, which is supposed to have direct and effective control. However, the draft plan has been subject to a lot of public debate, on the grounds that it would affect the interests of various groups. Whether it will be implemented is still very much in doubt.

Land use changes

Bangkok began to change rapidly in the second half of the 19th century in direct response to the policy of modernisation and westernisation. The land transportation network was progressively extended to Bangkok's suburban areas and water transportation began to decline. The city has progressively encroached the agricultural areas, so that the built-up areas of Bangkok have increased more than 122 times in the last 200 years (Suvanamas 1982: 30). While pockets of agricultural or unused land remain quite close to the inner zone (usually those areas far from main roads or poorly drained), these are disappearing rapidly as land uses intensify.

Figure 1 illustrates the changes in the pattern of land use in the built-up areas in Bangkok. Between 1958 and 1980, the area of the city grew from 76 to 360 square kilometres, and is forecast to reach over 700 square kilometres in 2001 (Office of Town and Country Planning 1987). The proportion of residential areas increased from about 56 per cent to 69 per cent between 1958 and 1980. Commercial areas are also predicted to grow. A significant feature from the point of view of public health is the paucity of recreational areas in Bangkok. OTCP (1987) classifies the area devoted to public parks in 1980 as 14 square kilometres (4 per cent of the metropolitan area) while Taweesuk (1990:619) calculates the areas of the eight main public parks, serving a population of over 6 million and over 66,000 users on weekends, as having a total area of only 2.5 square kilometres (0.16 per cent of the city area considered). This compares with a recommended proportion of 10 per cent (Taweesuk 1990:616) and proportions as ranging from 8 to 30 per cent in well known western cities. Anurak (1990:638) found that nearly half of public park users are the urban poor.

Conversion of agricultural land

The expansion of the built-up areas has been achieved through the conversion of agricultural areas within the greater metropolitan area (Thadaniti 1987:2). Between 1968 and 1980 agricultural areas decreased by about 30 per cent. Land speculation and housing development projects are currently the main contributors to land conversion, though new factories have played a role in eastern Bangkok.

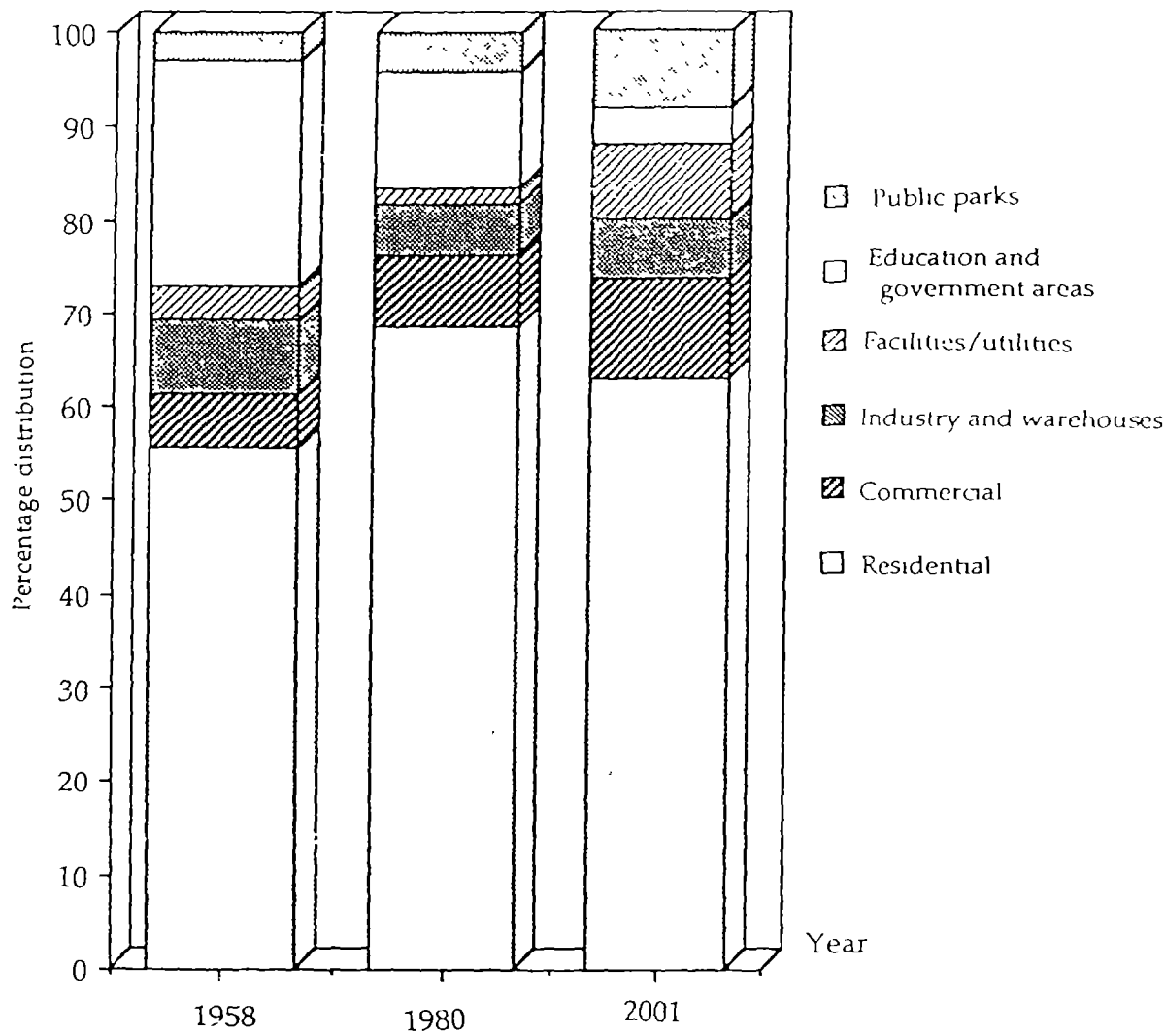

Figure 1 Land use in built-up areas in Bangkok in 1958, 1990 and projected for 2001

Source: OTCP (1987)

Nathalang (1986), in a study of the farmland conversion in the west of Bangkok, found that from 1967 to 1983 approximately 22,734 rais (or 3,637 hectares) of rural land was converted to metropolitan uses. The leading factor responsible for these changes was the building of a new highway through the area (Nathalang 1986: 109). Thadaniti (1987) notes the factors influencing the changes as including the improvement of road transportation between the inner areas and the outer suburbs, population growth, the investment of developers in housing estate projects, and the expansion of industrial factories as well as government offices. It is apparent that urban expansion in Bangkok will result in the loss of most of the fertile agricultural lands, as farmers are forced to give up their farms and sell their lands to a more profitable urban projects.

High-rise buildings

The high intensity of land utilisation, particularly in the inner city core, is largely brought about by the rapid rate of economic growth. The concentration of economic and business activities in Bangkok results in an increasing demand for commercial and residential high-rise buildings. Many thousands more high-rise buildings are expected to be built in the city in the near future. In 1987 Bangkok had almost 1000 high-rise buildings, and more than 1000 further projects were proposed in 1988 (Kulvisuth 1989). This intensification will undoubtedly exacerbate the problems associated with traffic congestion, inadequate infrastructure and public utilities. The character of the city, and consequently the ways of life of the city's population, will alter with the changing built environment.

Slums

The expansion of the city and construction of new buildings and infrastructure are having major impacts on the poor who live in slum areas under constant threat of eviction. Nevertheless, slum people play an important role in the growth of the economy, in that they provide the main source of cheap labour and of inexpensive prepared foods for consumption by the busy population. They also have a role in maintaining traditional social and cultural life, rarely seen in other parts of the city (Chantien et al 1990:187).

Despite a great deal of effort to control the city's slums, the numbers have increased dramatically throughout the city. Eviction simply disperses the residents to other parts of the city, often to more dangerous or more crowded sites. A survey in 1987 found 1,500 slum and squatter settlements in Bangkok (Chanont 1990: 194), a figure more than 40 per cent higher than that found by another comprehensive study carried out by Pornchokchai (1985). According to the 1987 survey, there are about 235,000 slum households with an average of 157 households, or 115 houses per slum (see table 3). The report estimates the total slum population at about 1.3 million and the growth rate at 2.3 per cent per annum. This means that about one in five of the city's population is living in slum areas.

Problems of slum and squatter settlements are always closely tied to the security of land tenure. Chanont's survey found that the land of 961 slums, or 64 per cent of the total slum area, belonged to private owners while 367 slums, or 25 per cent of the land involved, was owned by government agencies (Chanont 1990: 197). The National Housing Authority, after abandoning fruitless attempts to relocate slum dwellers into high-rise apartments in the 1970s, has adopted an innovative program of 'land sharing'. This involves assisting slum dwellers to negotiate agreements with landholders whereby they release part of the land they occupy for the owner's use, in return for a proper lease over the remaining land (Angel and Somsook 1988). The NHA is then able to assist with the improvement of infrastructure such as concrete walkways (land left vacant long enough to be taken over by slum dwellers is frequently swampy).

Table 3 Slums in Bangkok: number of slums, slum households, land ownership and land security

	Number of			Landownership		
	Slums	Houses	Households	Private	Govt.	Mixed & other
Total in Bangkok	1 501	173 770	235 655	961	367	173
Under eviction	36	7 995	10 571	26	10	-
Negotiating	23	3 007	3 878	12	9	2
Received notices	60	7 279	9 727	38	19	3
Potential of being evicted	193	24 611	38 082	101	55	37
Sub-total	314	42 892	62 258	177	93	44

Source: Adapted from Chanont (1990), Table 1 and 3.

ENVIRONMENTAL CONDITIONS

Bangkok is located on the delta of the Chao Phraya River, an alluvial pan of fine clay and silt. The clay is heavy and muddy during the rainy season, but hardens in the dry season. The plain is very flat, and low - the entire metropolitan area is about one and a half metres above mean sea level. As a result, the city has a serious drainage problem, with several parts of the city being submerged during the peak of the rainy season. Temporary floods also occur as the Chao Phraya River reaches its peak in November and December (TURA 1976:26).

The ground structure consists of alternate layers of clay and sand-gravel. The top clay layer, which supports the physical structures of the city, is highly responsive to the vibrations caused by heavy moving loads. Road surfaces, buildings and other structures can crack within a short period from constant vibration. This problem, long overlooked, has caused a considerable amount of barely visible damage to both government and private properties (Thadaniti, work in progress). Buildings are constructed on piles because the underground structure of the city is soft and cannot tolerate an excessive load. Support is generated through friction between the piles and the heavy muddy soil (TURA 1976:27).

Underground water is located at a depth of between 150 and 200 metres. Due to the shortage of water in the city, a large amount of underground water has been pumped out. This has resulted in severe subsidence, especially in central and eastern Bangkok. The heavy exploitation of ground water continues owing to the high cost of providing a fully integrated water supply system over a large area, combined with rapid urbanisation in areas without existing water supply systems (Thadaniti, work in progress).

Urban transportation

Bangkok has suffered traffic and related problems ever since its mode of transportation changed from one based on waterways to the automobile system. Many factors contribute

to the city's transportation problems. These include the unchecked increase in the use of private cars, the inefficiency of the public transport system and the lack of urban planning.

The city, with an area of 1,568 sq km, had 2 million vehicles registered by 1989. The average annual rate of increase in vehicles beween 1980 and 1988 was 25 per cent, with the majority of vehicles being private cars (790,000 in 1988 and increasing at 20 per cent per year) and motor cycles (775,000 in 1988 and increasing at 44 per cent per year since 1980). If the same rate of increase were to continue, the city would have about 4 million cars by the year 2000 - that is one car for every three people living in Bangkok, and approaching two (1.8) per household. These figures do not include those vehicles from surrounding provinces which commute to the city each day (Poungsomlee 1991 using figures from the Police Department and Department of Land Transport).

Road surfaces are not expanding quickly enough to cope with the great increase in the number of vehicles. The total length of roads - major, minor, and access roads - is 2,800 kilometres which provides a traffic surface area of about 38.44 sq km. This represents only 2.5 per cent of the total Bangkok area (Country Report 1989: 4), a proportion which is far too low when compared with the recognised standard used in other cities of about 20-25 per cent (NESDB 1983: 10).

Traffic congestion is continuous throughout the day, with little change at peak hours. The average speed on main roads is about 13-15 km per hour, reaching 20 km per hour on some roads (Country Report 1989: 6). In 1989 the Japan International Cooperation Agency (JICA) conducted a survey on The medium to long-term improvement/management plan of roads and road transport in Bangkok. This measured the average travel speed at 7.7 km per hour inside the middle ring-road zone, and as low as 3 to 5 km per hour in the most seriously congested area. The study predicted that the average travel speed would be 5 km per hour by the year 2006 if no remedial action was taken (JICA 1989).

There are obvious ecological as well as financial restrictions on the range of transport forms which can be provided in Bangkok. Underground systems, so effective in many western cities and Japan, are ruled out by the soil structure and water level. Rail has never been highly developed, and the few trains interfere with road traffic flow where the routes intersect. The ecological opportunity provided by water transport has been neglected in recent decades, but is undergoing a minor revival despite the level of water pollution. Overhead means, such as the 'skytrain', are under development but expense limits the number of routes possible. The only mass transportation system is the state-run public buses, a system which is far from rapid. Although the city has an apparently large number of public buses (about 7,000) serve commuters, they are not coping adequately with the population growth. Also, the fleet is old and its exhausts contribute seriously to air pollution. The Bangkok Mass Transit Authority (BMTA), which operates the bus services, is under pressure from heavy debts, since the bus fare is controlled by the government which keeps the price very low (at 2 baht, about ten cents, standard fare until recently). The management system is also inefficient. Consequently this sole transport system provides poor service and does not help relieve the traffic situation.

The time wastage resulting from traffic congestion and the poor public transport services encourages the growing middle-income population sector (who can afford them) to acquire more private cars. In addition, those who move to the new fringe areas of the city, often in advance of public transport being supplied, depend on their own cars. Because of the lack of effective control over land use, urban expansion is taking place without sufficient planning, and the inadequacies of the public transit network are aggravated.

The opportunity cost of time wasted by commuters on the road has been estimated at about 23 million baht per day, and the cost of fuel wasted is up to 5 million baht per day (Tanaboriboon et al. 1990: 57). Altogether, the economic loss from the mismanaged transport system is more than 10,000 million baht per year.

Air pollution and noise

Traffic congestion is one of the main causes of air pollution in Bangkok. The National Environment Board (NEB) measures of ambient air quality at its eight permanent measuring stations between 1983 and 1989 indicate serious problems only with respect to airborne particles (referred to as suspended particulate matter - SPM) and noise levels (NEB 1988). When roadsides were monitored in 1984, however, carbon monoxide also exceeded the NEB's standard at some measuring stations and was close to or over WHO recommended levels (half the Thai standard) at all ten stations. The measures of SPM were at or above the NEB's standard at all stations - this standard is difficult to compare with international benchmarks, as different units are used. Lead levels at these roadsides were comfortably within the NEB's standard, but the Organisation for Economic Cooperation and Development (OECD 1988) considers on the basis of recent health evidence that there is no safe level for lead.

The levels of particles were highest in the early mornings when traffic conditions are heavy and the air calm. Particles affect visibility, and may be toxic, irritate lung tissue causing long-term disorders, and cause cancers. The OECD (1988) summarises evidence linking particles to infant mortality and total mortality rates, and to aggravation of bronchitis, asthma, heart conditions and flu. Diesel exhausts are suspected of increasing the risk of cancers, and also accumulate on buildings and fabrics.

The general levels of the other pollutants monitored at fixed sites are within both Thailand's standards for air pollution and noise and those recommended by the World Health Organisation (WHO). These are standards for **average** levels of pollution over specified periods. However, the type of standard preferred internationally is a **level which should not be exceeded** more than once a month or year. The NEB's averaged data is not presented in a form which enables us to identify how often peak levels of each pollutant might have exceeded such standards. Thailand's standards for average levels of carbon monoxide and oxidants (ozone) are double those recommended by WHO, and those for nitrogen dioxide are at the level WHO recommends as not to be exceeded.

The NEB (1988) notes that lead polllution has shown improvement since the decrease of lead levels in petrol and the increasing use of liquid petroleum gas. Severe lead concentrations damage the kidney, liver, reproductive system, blood formation, basic cellular processes and brain function. Lower concentrations are now being recognised also to have serious effects, especially in children who are more easily exposed through their activities, and who absorb higher proportions of lead than adults.

Levels of carbon monoxide were believed to have remained low because the rate of petrol consumption increased only 10 per cent between 1983 and 1986, as people preferred to use diesel and LPG for cars (NEB 1988:17).. However, Jenwitheesuk (1988), reporting for the NEB and using monitoring data from 1985-1987, found a serious risk of carbon monoxide poisoning, with those living in buildings near busy streets and in schools, hospitals and houses over two storeys being at risk. The maximum one-hour average ranged from 10-60 milligrams per cubic centimetre of carbon monoxide (Thai standard = 50 mg/cm^3, WHO standard = 25 mg/cm^3 to be exceeded no more than once a year) and the maximum eight-hour average ranged from 4-39 mg/cm3 (Thai standard = 20, WHO standard = 10). The differences in apparent seriousness of levels of carbon monoxide close to roads and more generally might be explainable by the levels decreasing with distance from their sources. Carbon monoxide interferes with the supply of oxygen by blood to body tissue. In urban areas it has been linked to loss of worker productivity and general discomfort. It can affect the central nervous system, affecting physical coordination, vision and judgement. It can also affect the cardio-vascular (heart and blood vessels) system, making heart conditions more serious (OECD 1988).

The main factors contributing to air pollution are the lack of regulations requiring cars to have annual inspections, the weakness of law enforcement, a lack of awareness by industry, and the traffic (Suthipitak et al 1990:107-108).

Noise levels measured by the NEB from 1983-1987 at 13 locations were all above the internationally accepted level of 70 dBA (a weighted scale of decibels). Thailand had no community noise standard, and that for vehicles was set at 100 dBA (equivalent to the sound of a pneumatic drill) at half a metre from a car's exhaust, and 85 decibels (a typical vehicle noise level) at 7.5 metres away, respectively. The NEB's average 24-hour measures at 13 streets ranged between 70-90 decibels from 1983-1986 (Suwarnarat et al 1989:26). Over 21 per cent of motor cycles violated the noise standard, and 18 per cent of trucks and 15 per cent of tuk-tuks (three-wheeled vehicles) (TDRI 1987:197). Noise levels at 30 major corners monitored monthly for a year between 1985 and 1986 exceeded 80 decibels (Department of Health, BMA 1987). Water vehicles contribute to the noise problems, with 80 per cent of boats surveyed in 1983 exceeding 90 decibels noise emission, and 80 per cent of the operators having hearing loss (Phantumvanit and Liengcharernsit 1989:38).

The harmful effects of noise - annoyance, behavioural changes, stress, hearing damage and physiological reactions - are often interrelated. Recent evidence is that the body does not adjust so well to noise as formerly thought, and that certain types of motor cycle noise are particularly destructive (OECD 1988). Sleep disturbance means that the body is less able to recover from physical and mental fatigue, and stress caused by noise contributes to conditions of the cardiovascular and digestive systems. Noise also affects communication, such as the intelligibility and ease of conversation, and sound signals such as music and television (OECD 1988). These are essential to enjoyment of life and well-being; social relationships are important to people's pleasure and survival, clear communication can be vital in matters of safety, and quietness or music are important towards relaxation.

Major reasons for vehicle noise include tampering with exhaust pipes to deliberately increase the noise level - popular among motor cycle owners - failure to replace worn exhaust systems, and inadequate enforcement (TDRI 1987:210), inconsistencies between government departments in adopting noise standards, inadequate funding for checking, and lack of public awareness and cooperation.

Kiravanich (1985:39-41) has suggested the improvement of air pollution and noise through the improvement of the public transport system and city planning, the regulation of emissions in new vehicles and removal of old polluting cars, the preservation of green areas and trees, public awareness and research.

Water quality

Water has traditionally played an important role in Thai society. Communities have relied on water for many purposes, including agricultural production, household consumption and transportation, and Thailand has frequently been described as a 'water-oriented society'. However, this image is becoming less appropriate in the wake of urbanisation and industrialisation. The waterways have received little attention in city and infrastructure planning, and this neglect has contributed substantially to the present crises in water quality and transportation.

There are three main sources of pollutants in the Chao Phraya River and its tributaries, and the city canals. These are factories, households and restaurants. Although large factories are required to install water treatment facilities in order to obtain their annual operating permits from the Department of Industrial Works (DIW), this does not apply to many medium and small plants. The existing household water treatment capacity serves about only two per cent of Bangkok's population (Suwarnarat et al. 1989: 11; Phantumvanit and Liengcharernsit 1989: 33). The waste-water of most households is discharged to canals and then drained into the river to become an important source of organic effluent. The six most

polluted canals share over 54 per cent of total domestic pollution loads discharged (Biochemical Oxygen Demand, or BOD load) into the Chao Phraya River (Panswad et al. 1987: 153-154).

Domestic sources account for about 75 per cent of the pollutants discharged into the Chao Phraya River (BOD load), while factories account for the remaining 25 per cent (TDRI 1988: 32). Among the non-industrial sources, household effluent accounts for over 54 per cent of the pollution. Restaurants are another major contributor, responsible for 36 per cent. The rest comes from markets, hospitals, hotels, dormitories, and other sources (Panswad et al. 1987: 138).

The results of the water quality monitoring program for the Chao Phraya River by NEB found that during the dry season (January to May) the lower part of the river (the 62 kilometres from the mouth) is in crisis. Between 1978 and 1986, the Dissolved Oxygen (DO) concentration was, on average, 0.5-1.0 milligram per litre, which is well below the standard recommended for household consumption and industrial utilisation purposes of 2.0 milligram per litre (oxygen is a convenient measure as it is essential to sustain life in the water). Also, the levels of Biochemical Oxygen Demand (BOD) and other pollutants did not meet the standard, and the total coliform bacteria count was very high (NEB 1987: 42), indicating that pollutants from household sewage make a significant contribution to city water pollution.

A study by the Environmental Health Division of the Ministry of Public Health also found DO, BOD, and coliform bacteria levels of the lower Chao Phraya River during 1977-1987 to be below recommended water standards. The maximum BOD found was 9.0 milligrams per litre, and the minimum DO was nil milligrams per litre. Some other pollutants such as faecal coliform bacilli, mercury, and different kinds of chemical fertilisers were also very high. The report commented that if the quality of the river continued to deteriorate, the natural recovery capacity of the water would be prevented, with undesirable consequences for human health and aquatic life (Department of Health 1988).

JICA (1981) forecast that if a sewerage and water treatment system is not installed and operated, the Chao Phraya River could become anaerobic (DO concentration of 0 milligram per litre) in low flow conditions by the year 2000.

With the inevitable growth of the city, the problem of water quality will become increasingly severe. Panswad et al (1987) recommend that the government should consider setting effluent standards. In the short run, they estimate that effective controls could reduce the pollution load from buildings and housing estates by about 62 per cent. Restaurants and markets should also be targeted for enforcement. Moreover, in the long run, the problem of wastewater from household discharge requires solution as it shares more than 54 per cent of the total pollution load. On-site treatment for each household would be a worthwhile and possible option (Panswad et al. 1987: 153-154).

A TDRI technical team commissioned by the NEB towards an alternative wastewater management system for the city proposed using intercepting sewers to collect wastewater from the storm drains. The wastewater would be treated prior to being discharged into the canals or river. This study estimated that the total investment cost for this system would be 11,000 million baht (1988 prices) (TDRI 1988:69; Phantumvanit and Liengcharernsit 1989:34).

Water pollution in the city is capable of solution. Technical factors and lack of public cooperation are not major obstacles, in that relatively inexpensive technical solutions have been suggested and the public is already concerned about the problems. In the final assessment, the solution depends on the willingness of the government to take effective action to solve the problem.

Solid waste and toxic substances

The increasing urban population and more western consumption patterns resulting from industrialisation lead to an increase in refuse. Refuse is conventionally divided into 'solid wastes' and 'toxic substances'.

Bangkok's population was estimated to generate about 4,850 tons of garbage or solid wastes per day, about 0.9 kilograms daily per person, in 1989. The amount of solid waste was projected to increase at a rate of 4-6 per cent per year with the increase largely comprised of non-biodegradable substances (NEB 1989).

Waste collection in Bangkok is the responsibility of the Bangkok Metropolitan Administration (BMA). Almost 84 per cent of the population is served with refuse collection. There are two means of collection at present, door-to-door and block collection systems. In 1988, BMA had 732 trucks, although only 76 per cent of these were in operation each day. The distance between collection places and dumping sites is considerable, averaging 25 to 45 kilometres. Because of this distance and the traffic congestion, the trucks take about 1.5 to 2.0 hours per trip. The slowness of the trip is also due to the fact that the workers spend time selecting some of the refuse items for their own purposes. These factors contribute to the non-collection of a large amount of the solid wastes, amounting to about 575,000 kilograms per day, or 14 per cent of total solid waste production. All of the refuse collected is sent to three sites - at On-Nuj, Nong Khaem and Ram Intra. About 90 per cent of the refuse is dumped in the open and left to decompose naturally, while 10 per cent is taken to four composting plants for fertiliser production (NEB 1989). Since these figures were collected major improvements have been made to the system of rubbish collection by the BMA, under the reformist Governorship of Chamlong Srimuang. The underlying problems of rubbish generation, transport and disposal still remain, however.

Another aspect of the problem is the considerable amount of rubbish left on the roads, pavements and other public places. The removal of this material is the responsibility of the road sweepers, who now outnumber refuse collectors. It is estimated that each road sweeper is responsible for about 1.3 kilometres of road length (Suwarnarat et al. 1989: 15).

The problem of solid waste management in Bangkok is a difficult and complex one. For example, the high value of land restricts the availability of dumping sites and makes long-term planning difficult. The small BMA budget limits the improvement of the inefficient decomposing plants. The high proportion of wet organic refuse coming from markets contributes to the low efficiency of refuse collection. Solid waste management consumes a large proportion of local government revenues, and less than five per cent of the costs are covered by direct user charges. The small charges make the activities an unattractive proposition for private business, so the burden remains with the city's government.

The toxic substances causing most immediate concern are organic and inorganic chemicals and heavy metals. Chemical wastes are released mainly by the heavy manufacturing industries concentrated in and around Bangkok. These industrial plants include lead-smelting, and factories manufacturing fluorescent lamps, dry cell batteries, paints, pharmaceuticals and textiles. Between 1970 and 1986 the number of registered plants using and disposing of toxic chemicals rose from 78 to 615 (TDRI 1987: 249).

Industrial plants produce about 40,000 - 60,000 tons of hazardous wastes yearly. These toxic wastes require special treatment before being released into the environment. These industries also discharge effluent containing about 12 tons of heavy metals yearly (NEB 1987: 64). Unfortunately the existing regulations relating to toxic waste disposal are not enforced effectively. There is a need to strengthen the terms of reference concerning environmental impact assessments on proposals for new industrial plants.

INDIVIDUAL AND SOCIAL WELL-BEING

Published indicators are very limited when it comes to the social qualities of any city. Few variables are measurable, at least reliably, and those which are may not be central to such social qualities as the richness of culture, social cohesion and support networks, or individual senses of well-being and enjoyment of life. The following are presented as a guide to the statistical indicators available, but our main interest is in the qualitative information reported in the next chapter.

Health indicators

Health statistics are the simplest indicators of quality of life in any society. Basic indicators such as live-births, mortality, infant mortality, maternal mortality, and causes of death are simplistic summaries of the extremes of poor physical health conditions, but suggest where problems lie.

With the relative improvement in public health and medical services, the rate of death in Thailand has decreased dramatically, from 9 per thousand population in 1957 to 4.3 per thousand population in 1987. Life expectancy at birth has increased to 62 years for males and 68 years for females, and is predicted to reach 67 and 71 years respectively by the year 2000 (Division of Health Statistics 1989).

There is a significant health disparity between Bangkok and other regions. For example, the mortality rate in the northern region was about 4.7 per 1,000 population in 1986 while that of the whole country was about 4.1 and of Bangkok about 3.9. Meanwhile, Bangkok is far better provided with health services than other regions. In 1987, the population per doctor in Bangkok was only 1,418, while in the rest of the country it was more than 8,000. A similar situation applies with other medical personnel. The ratio of population per hospital bed in Bangkok is about 316 persons - in the rest of the country it is about 718 persons.

Even though the population of Bangkok has better access to medical services than people in other regions, their conditions are far from satisfactory. Public Health Statistics (Division of Health Statistics 1989) show that the rates of death in Bangkok from diseases of the heart, accidents, and cancers far exceed those in the rest of the country. Eighty four in every 100,000 city residents dies from heart failure each year (1988 figures), and deaths caused by cancer and accident are also high. These figures are related to the different patterns of life from the past, partly resulting from urban development, modernisation and westernisation.

There is increasing public concern that improvement in the health of the population is necessary for national human resource development, as rates of ill-health decrease the country's productivity. However, government expenditure on health remains very small, usually less than 5 per cent of the total budget.

Most of the health services are delivered by the government. The cultural system of hierarchical relationships mitigates against effective health care, because health personnel are usually regarded as superior to the ordinary people who request their services, and patients are expected to be obedient followers who do not question, but act as passive recipients (Sermsri 1986: 19).

Psychological problems seem to be the only aspect of health that does not differ between regions. Although the city population is generally believed to be faced with many psychological problems such as stress, there is very limited research on this issue. The national data available show that the number of patients with mental disorders serviced in hospitals is high. The numbers increased constantly between 1983 and 1986, and by 1987

the total number of patients serviced in hospital was about 680,000 (NESDB 1989b: 16-17).

A survey of 2,000 households (7,731 residents) carried out in Bangkok in 1986 using the Berkman 'Index of Psychological Well-being' found that more than 44 per cent of those studied had psychological and related symptoms. More than 32 per cent of the population under 15 years old, and 49 per cent of the population of 16 years and over, had psychological problems. The latter group was dominated by less educated, divorced, and low income people (Meaksupa et al. 1987).

Criminal offences

The security of human life from violence, and of property from theft, are measurable, though indirect, indicators of social well-being. They reflect societal changes, such as reductions in social cohesion, and economic disparities which invite poorer people to commit crimes for their survival. These tensions in a society also make people less tolerant of one another.

Criminal statistics released by the Police Department in 1988 suggest high rates of both violence and robbery. In 1988, Bangkok had a quarter of the 84,000 crimes reported for the whole country, whereas its population (though difficult to estimate) is officially under 12 per cent of Thailand's 55 million. The rate of violent crimes in Bangkok was estimated at about 37.7 per 100,000 of population, with one violent crime being reported every four hours. Within this figure, the murder rate was 6.1 per 100,000 of population, and the incidence of rape was similar. The actual incidence of such crimes may be even higher than that reported to police, and thus reflected in statistics.

A study of the 1,626 homicide cases admitted to two hospitals between 1986 and 1989 found that over these four years, the incidence of homicide was rising in all age groups, with males outnumbering females nine to two. The highest percentage of homicide cases (39 per cent) was found in the 20-29 year age group, and gun shot wounds were the commonest cause of death. The study also found that the number of homicides was directly related to the number of slums and drug addicts in each district (Pholeamek and Prateepvisut 1990).

Drug addiction is another symptom of social deterioration. The Department of Health of the BMA reports that in 1988 the number of drug addicts entering hospitals for treatment in Bangkok was about 46,000, with about 3,000 new drug addicts being reported each year.

Since the data for this part of the study was collected, Thai society began to come to terms with the extent of AIDS in connection with drug addiction and prostitution. An early medical study by Vitiyasai in Chiangmai, found very high rates of HIV infection among young poor women who had been prostitutes for over three months, with the rates correlating with their prices. The rate peaked at 72 per cent among the poorest prostitutes (The Nation, 2 February 1990). Prostitution in the cities is well known to be related to rural poverty, as the daughters of families suffering from rural debt, or aspiring to consumer goods beyond their means, assist their families voluntarily or under duress.

COMMENTS

This biophysical and statistical profile is provided by way of background to our data showing how Bangkok people experience these conditions. The profile suggests that conditions are far from well, environmentally or socially. Many of the studies producing these figures link the environmental problems to features of land use, such as the allocation

of space to roads, the weakness of urban infrastructure such as sewerage and the public bus system, and the political decision-making problems which have allowed these conditions to get so far out of hand.

What is not known is how these conditions really affect people's daily lives. Health problems can be anticipated from the levels of water and air pollution, depending on the degree of exposure occurring in people's lifestyles, but it is impossible to obtain health statistics in a form which relate directly to environmental conditions. We are interested in the direct and indirect effects of environmental conditions on people's well-being, including the ways in which their behaviour patterns expose them to stressful and harmful conditions, the ways in which environmental stresses affect their communities and families, the ways in which they adapt, and how their adaptations collectively transform the built environment.

THE PRELIMINARY STUDY

The primary data collection towards the preliminary study involved a detailed study of a selection of communities currently affected by various aspects of urbanisation. Focus group interviews, described below, were used to collect community members' perceptions of environmental conditions in Bangkok and their own communities, and their accounts of how environmental and social conditions affected their daily lives.

THE FOCUS GROUP METHOD

The focus group interview is a qualitative research method used increasingly in social science studies in recent years. It was initially developed and widely used in market research, and later applied by demographers and anthropologists in qualitative research on family planning. In Thailand, the method has been used in studies of fertility (see Knodel et al. 1983, Knodel et al. 1988, Havanon and Pramualratana 1983, Pramualratana et al. 1985).

The main objective of the method is to gain insights into the knowledge, beliefs, attitudes, and perceptions of people and communities. Focus groups are often used for exploratory purposes, to complement quantitative studies, for example to help in formulating questions for structured questionnaire surveys. The methodology is described in detail by Krueger (1988), and Morgan (1988).

A small group of discussants (usually six to twelve people) is invited to come and talk about the issues under investigation. The participants are usually selected through a screening process of brief interviews, aimed at ensuring that participants are relatively homogeneous with respect for example to age, educational level, and socioeconomic background. Homogeneity is considered important to ensure common interest and uninhibited discussion, particularly where the topics may be socially sensitive. The criteria for the selection of communities and participants depend on the purpose of the study and particular issues under investigation.

The discussion is guided by a well-trained facilitator or 'moderator', following a set of guidelines or questions. Unlike other forms of group interview, emphasis is on the group generating ideas and sharing viewpoints together, so that the discussion flows among the participants rather than to and from the moderator. The meetings are usually tape-recorded. Notes are also taken, on the general mood and level of interaction in the group as well as on the content of the discussion. A caretaker may be employed to make sure that the discussion is not interrupted.

The location for the focus group meeting should be a place where the participants feel at ease, and which is also 'neutral' in terms of the research interests. For example, a local government office would not be an appropriate place for meetings with local groups about problems related to the local administration.

The use of focus groups in Bangkok's urban communities

Aims

This study used focus groups to provide local knowledge about, and perceptions of, changes in the environment, and information on the people's behaviour and adaptive responses to these changes. The specific aims of the interviews were:

1. To study human situations and the impacts caused by the development process, economic growth and the expansion of the urban area. More specifically, to identify the types and scale of change that bring about physical and social

transformation involving people's life conditions at the community and family levels.

2. To study people's attitudes and perceptions towards the changing urban environment and assess how people adapt to the changes and the new environment.

3. To study the impact on people's quality of life, specifically with respect to health (physical and mental) and well-being, and lifestyles.

Procedure

In this study, the principal investigator, Anuchat Poungsomlee, was the moderator of each discussion. He selected the communities with the assistance of district officers of the Bangkok Metropolitan Authority, particularly those involved with community development activities. Twelve communities were considered, and seven eventually chosen (one as a substitute for an inner city community in which it had not been possible to raise focus groups representing both age groups under study). These locations, and the rationale for their choice, are described in detail below.

Once community leaders had agreed to participate in the study, he familiarised himself with each community by observation and a conventional group interview involving longstanding residents active in community affairs. These interviews gave historical and other background on each community, which form the basis of the community descriptions later in this chapter. Without this background, the views expressed in the later focus groups could not have been understood.

Participants in the focus group discussions were required to have lived in the community for ten or more years, to ensure their familiarity with and sense of belonging to the community concerned. Ten years was considered to be an appropriate span to represent changes resulting from urbanisation, and to be within the comfortable memory of the participants. Two groups were held in each community, representing the generations of 'younger' and 'older' adults, aged 25-40 years and over 55 years respectively. There was one exception, where two similar communities had to be used to achieve one focus group for each age bracket. These ages were applied flexibly where potential participants were in scarce in these age ranges, and where older adults were concerned, general health and the ability to participate effectively in the discussion were also taken into account. A large gap between the age ranges was allowed, to ensure a clear generational difference between the groups. Altogether 103 people, 52 men and 51 women, participated. The groups were mixed, as the topics of discussion were not so sensitive as to require gender separation (in family planning studies, single-sex groups are usual).

The group meetings were held in a range of popular and reasonably neutral community settings, including schools, temple grounds and private houses. Each discussion was limited to two hours, and participants were rewarded with refreshments and a token gift. Interruptions were not entirely preventable in the two open-air temple settings used, but the flow and quality of discussion recovered quickly in each instance.
After the interviews, the tape recordings were transcribed by a research assistant (who had been present as 'note-taker') and translated into English by professional translators. The principal researcher for this phase of the study, who is bilingual, coded the data according to the issues discussed, and used content analysis to explore the details and linkages described.

LOCATIONS

The preliminary study concentrated on three districts of Bangkok - Phaya Thai, Bangkok Noi, and Taling Chan - from the inner, middle and outer zones of Bangkok respectively.

Bangkok Noi and Taling Chan are adjacent, on the rapidly expanding western side of the city where a new bridge across the Chao Phraya and new major roads have opened these areas for residential use at the expense of agricultural lands.

Bangkok city includes a wide range of different living environments. The communities selected for the preliminary study represent the most typical of these 'habitats', from slums to high-income housing, and from densely populated inner areas to agricultural and klong (canal) communities experiencing the pressures of urban expansion for the first time. Communities, as habitats, were chosen in preference to the more conventional socioeconomic methods of sampling, as lifestyle and living environment are interlinked. People of one class or income bracket, on the other hand, may live in very different habitats: the poorest in slums or agricultural communities, and the well-off in traditional sois (lanes) or modern, westernised housing estates. Communities on the urban fringe, such as the market gardeners and orchard growers in Taling Chan district, provide a particularly interesting case of land use conflict and other impacts of the urbanisation process.

The communities

Six communities were selected initially, with two focus group sessions, for younger and older age groups, planned for each community. A seventh was added to provide an older group which had not been possible in the inner city community. Their locations are shown in figure 2.

Table 4 provides a summary of the main characteristics of the seven communities. The following descriptions of the communities are based on the findings from the group interviews which preceded the focus groups, field observations, and documents provided by district officers.

Inner city community (Phaholyothin, Phaya Thai)

This is a typical inner district area, with well-off middle income residents. The area is about 500 metres away from a major arterial road, Phaholyothin Road. The people are employed mainly in government and business in the city. Although many of the residents had been living in the area for over 20 years, they did not know one another very well. Being in the city core, the area is well supplied with public facilities. Most members of the households have their own rooms. Being relatively affluent, the households have adapted to adverse aspects of the environment by having air-conditioning in every room, and more than one car and television set per household. Security is not a major problem for the community. There is no community committee. Some difficulty was experienced in recruiting participants, and it was possible to conduct only one focus group, with younger adults.

Inner city community (Bhanurangsri, Bangkok Noi)

This community was selected to substitute for the older adults focus group needed to complement Phaholyothin community. The area is now administered by a new district, Bang Plad, subdivided from Bangkok Noi during the course of the study. The area has been developed as a housing estate in the last 15 years. The community is located about 500 metres behind the major road for western Bangkok, Charunsanitwong Road. It shares similar characteristics and lifestyles with the Phaholyothin community. However it also has elements of a suburban lifestyle, because most of the people come from the country or from the western Bangkok area. The socioeconomic status of people is middle income. Social interaction among neighbours is less than in the past as most people work full time. There is no formal committee or village organisation. There are no particular problems with respect to public utilities and government services.

Table 4 Summary of communities selected for study

Living Environnment	Economic Status	Occupational Structure	Land Tenure	Land-use Pattern
Inner city community (Phaholyothin)	Middle income	Business, Govt. services	Own	Urban residential
Inner city community (Bhanurangsri)	Middle income	Business, Govt. services	Own	Urban residential
Old subdivision community (Suan Pak)	Middle income	Govt. services, manufacturing	Own	Semi-residential
Canal community (Wat Makork)	Low-middle income	Farmers & employees	Own	Agriculture & residential
Agriculture-based community (Wat Puranawas)	Low income	Farmers, employees	Rented	Agriculture & rural setting
Slum community (Phoriang)	Low income	Govt. & general employees	Own	Residential & slum
Slum community (Bang Khunnont)	Low income	General employees	Rented	Residential & slum

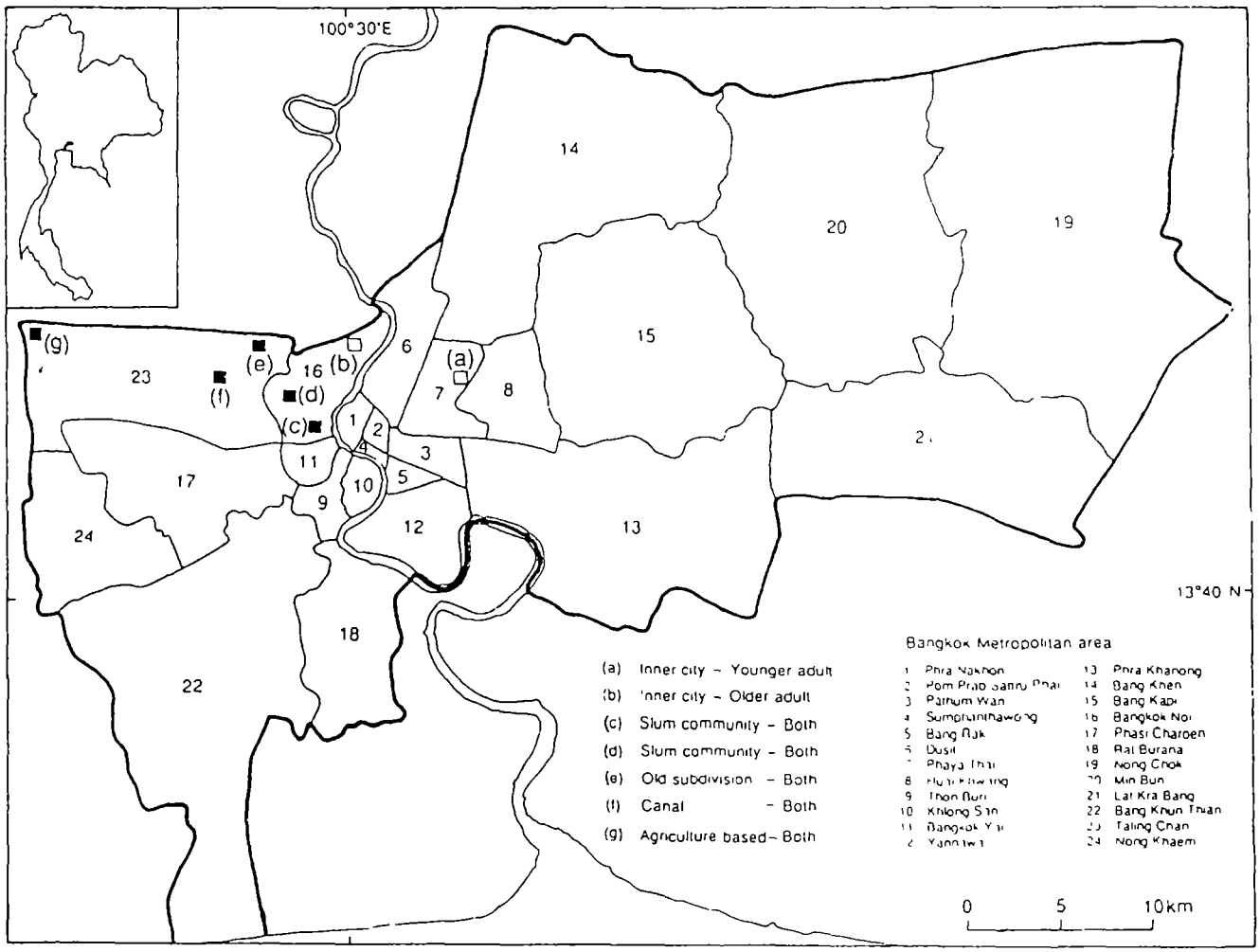

Figure 2 Study areas

Slum community (Phoriang, Bangkok Noi)

This community is located in a congested area about 100 metres away from the major Charunsanitwong Road, and is about 30 years old. The area used to have vegetable and flower gardens and orchards, but the agricultural areas have been completely converted into houses and retail and commercial activities over the last 20 years. The socioeconomic status of this area is low income, but the people have reasonable economic security. Their main occupations are in government, state enterprises, and as construction or factory employees. Most of the population own their own land and houses. Because of their security of land tenure and reasonable income, people in the area are better-off than people in some other congested areas.

The community is growing very quickly and, according to the chairperson of the community committee, has more than 700 households. The area has become congested in the last five to ten years as many migrants have moved in from rural areas to stay in the relatively inexpensive rented rooms or houses. The area experiences flooding almost every year, and in 1983 was flooded for two to three months. Following this the walkway into the community was upgraded. One of the major problems confronting the community at present is the drainage system. The existing system is inadequate because of the filling up of the drainage channels, the solid waste in the form of plastic bags and other garbage, and the tidal movement of the river. The adjacent canal is also used for drainage and this creates similar problems.

It is likely that the community will experience problems of land use conflict in the near future, because the surrounding areas are now earmarked for a private land development project. The new land development will be placed at a higher elevation than that of the present community, and this will increase the flooding during the rainy season. Moreover, it will also create additional problems relating to drainage and sewerage outlets.

The social interaction among the community members is reasonably good except for a few conflicts between neighbours, as there is little interaction between the majority 'old residents' and the newcomers. Security and safety are no longer a major problem since the establishment of police check-points in the last few years. There is a very old temple (Wat) located in the middle of the community which is used as a focal area for community activities as well as making 'merit'. However, the role of the temple appears to be declining because of a conflict in the last four to five years between the abbot and the community members.

The community organisation is relatively strong and effective. Major community development projects have been undertaken on the initiative of local residents, such as pavement upgrading, constructing a drainage system (though drainage remains a major problem) and introducing public telephones and fire extinguisher boxes.

Slum community (Bang Khunnont, Bangkok Noi)

The whole area of Bang Khunnont was changed after the construction of the new Pinklao bridge across the Chao Phraya River. This bridge was built in conjunction with a new outer ring-road joining the western parts of Bangkok. The main streets in Bang Khunnont are now full of shop-houses and small factories, while the back streets are residential areas. Land values are increasing sharply and agricultural areas are now scarce.

The community is located near Bang Khunnont-Taling Chan Road. This area used to be famous for growing fruits, including durian, oranges, bananas and mangos. The community was established after the railway line was built through the area. Since that time it has expanded greatly, and the orchards have gradually disappeared. At present, the community consists of about 400 households which are surrounded by commercial areas and permanent housing. Most people in the community are still relatively poor. They earn

their living as general construction workers, public employees and manufacturing workers, hired on a daily basis. Many housewives make paper flowers at home to supplement the family income. About half of the population rent their land from private owners and the rest rent from the temple, which is now managed by the Department of Religious Affairs.

The area has become more congested during the last three to five years as many more people have moved in. The new people live mainly in rooms or houses rented from long-standing residents. However, the community is still not very densely populated by Bangkok standards, although there are many environmental problems including accumulation of garbage, a poor drainage system, and a polluted canal (klong). The canal was used by many residents for bathing and washing until recently. The only physical improvement to the community has been some upgrading of the pavement in 1983. There are also some social problems relating, for example, to drugs, security and noise levels. A community committee has been set up in the last two to three years. Although the organisation is still not very strong, the participation of residents in public activities is at a high level. This reflects a very strong social cohesion among the people, in which the community temple and the school play a crucial role.

Old housing subdivision community (Suan Pak, Taling Chan)

This area is located in an old land subdivision which has been sold to middle income people in the last 20 years. The houses were built by the owners, who are the pioneers of the area. People moved in for various reasons, including cheaper and larger areas of land, the advantages of living near places of work and attraction to a clean and green environment. Because of the relative isolation in the early stages, most residents know each other well. There is no formal community committee, but people are well organised and cooperate with one another. For example, this was the only community within a large area that was able to avoid being flooded out in 1986. Because they are quite well-off, and because some residents are associated with government authority, they have bargaining power and have gradually been able to obtain good facilities, such as electricity, telephone, water supply, garbage collection and roads.

The socioeconomic status of people in this area is middle income. Residents are mainly employed in senior positions in government service, as university staff, or run their own small or medium-sized businesses such as factories. The main concern of people in this area is the rapid change in the surrounding areas. New roads adjacent to the community are being built, and farmlands and gardens are being converted for housing developments and other government projects.

Canal community (Wat Makork, Taling Chan)

The majority of people in this area live along canals and still use long-tailed and personal boats as their main means of transportation. Agriculture is still a dominant land use and basis of the people's livelihoods. The district is famous for market and flower gardens. Fruits and vegetables produced in the area provide fresh food for the inner city. Although the area is zoned as a 'green belt', the agricultural areas are rapidly being transformed into housing estates. Most of the people have low incomes, but they are self-sufficient with the exception of those who live in a small adjacent slum. This is because the farmers and agriculturalists own fairly large pieces of farmland. Many farmers are gaining additional income from selling pieces of their farms.

The Wat Makork area provides a clear picture of the transition from agricultural land to residential land, highlighting problems associated with the impacts of modernisation and urbanisation. For example, the construction of Pinklao-Nakornchaisri Road and connecting roads through the area has imposed a range of new pressures and changes on the community. Land prices have increased ten-fold. The market gardens and orchards are so badly affected by the serious pollution in the klongs which are used for irrigation, and the

increased and polluted annual flooding, that people are forced to cease production or to sell some of their land. This is regrettable in terms of the recognised need for conservation of the agricultural and green areas of Bangkok.

Land sales are also affected by the lack of a local market for farm produce. There is no market in Taling Chan at all, and people must take their products to Prannok and Pak Klong markets in the city, where there are often conflicts about selling spots and the prices they receive for their products, such as galingar, lemon grass and lemon leaf are very low.

The people in the community have a strong sense of belonging, and there is a clear distinction between 'old people' and 'new people'. Most of the old people have been together for a long time, and regard one another almost as belonging to the same family. They are therefore very attached to their community. The newcomers have not been assimilated by the 'old people' so well because of the changes in the economic environment. Most of the newcomers are lessees and have regular jobs outside the area, so they have less opportunity to associate with the people in the community.

Although the Bangramad sub-district formerly had a local self-government structure with heads of the sub-district and heads of villages, the bargaining power of the community was minimal. One year after the establishment of a community committee (initiated by the district office under the 'basic need program'), there is still no strong and effective organisation. In comparison with some other communities, people here still lack the experience in bargaining with the authorities necessary for improving their situation.

The people are, in general, rather complacent towards the changes caused by the invasion of housing projects and the reduction of agriculture, partly because the changes are so gradual.

Agricultural-based community (Wat Puranawas, Taling Chan)

This community comprises two major villages located along the bank of a canal, with a temple between them, and is situated at the far western side of Taling Chan district. The community is an old settlement of paddy farms. The continually falling prices of rice have forced the farmers to turn to growing vegetables and fruit. However, most of the villagers, especially the young people, work in the factories in the nearby areas of Nakornchaisri and Nakornpathom, leaving old people and children at home and to work the farms.

The socioeconomic status of the people is generally poor. The people live in low-density single houses along the canal. The most serious problem faced by the villagers is the pollution of the Mahasawat canal, caused by the ineffective drainage systems of the fish ponds, powdered fish factories, and other factories. People cannot use the water, especially during the dry season. A solution to this problem is impeded by the fact that the source of the pollutants is in an area which is the responsibility of different government offices.

Other problems are related to the tendency of the authorities to ignore the problems of the villagers because they live in a relatively remote area. A community committee was established in the middle of 1988. However, villagers still do not have access to public facilities such as drainage systems, running water, and telephone. They therefore have to rely on the canal water for their household use. During the past few years, water from artesian wells provided by the temple has become available through pipes to the villagers. The community does not yet have regular garbage collection by the BMA. Although a garbage truck comes to the area sometimes, poor families which cannot afford the monthly fee have to take their garbage to the truck themselves.

There has been a major change in land ownership, as most villagers who formerly owned large pieces of land have sold them in response to the rising land prices, the failure in agricultural production, and the rise of housing development projects along the two main roads.

The main health problems of the villagers are water-borne diseases and haemorrhagic fever caused by mosquitoes. These diseases are common among those who live on the canal bank. Factory workers often experience serious accidents and become disabled, and a number are unhealthy owing to exposure to dangerous chemicals.

Relationships among the community members are quite close. Social problems include drug abuse and gambling. Another emerging problem is the loneliness of old people, who remain uncared for while young people are working outside the community. The school and temple are still community centres although fewer people participate nowadays in temple activities, due to the fact that most villagers have to work outside the village.

COMMUNITY VIEWS ON URBAN PROBLEMS

The focus group sessions proved an excellent way of taking an integrative view of the city - from the point of view of the inhabitants. Ordinary people make links between environmental, human and societal influences on their habitats and behaviour in a way which experts seldom can, because their own daily experience provides the points of integration. For example, Bangkok people are highly conscious of ways in which government and city management decisions and inactivity (societal decisions) affect the roads and transport systems available (biophysical features arising from societal decisions). These in turn affect their commuting behaviour (behaviour patterns) and stresses on themselves and their families (human part of the framework). An expert study, by contrast, would concentrate either on measuring traffic flows, or health, or even analysing government planning and decision-making, but would be most unlikely to explore the other sections of this causal chain.

The people agree with the literature and official studies as to which urban environmental problems are important, but analyse their causes and effects in a fresh, integrative and personalised way. They also add new issues for discussion, as they consider their economic and social circumstances to be yinseparable from the environmental problems. Their analysis of the city is presented first in terms of the well-known environmental problems, then in terms of the socioeconomic conditions and changing life conditions in their neighbourhoods. The following summary uses many direct quotes, translated from Thai. In these, the abbreviation 'P' refers to a participant in a focus group, so that 'P1' is the first speaker in a section of discussion quoted, and 'P2' the second speaker.

ENVIRONMENTAL CONCERNS

This section focuses on three main concerns: urban transportation, which links traffic, air pollution and noise; water pollution, and urban land use.

Transportation

The previous chapter outlined environmental and societal factors which are integral to the making and changing of the city's transportation systems. The options are extremely limited, on environmental and economic grounds. Underground transport, an effective form of rapid mass transit in societies which can afford it, could never be possible because of the floodplain. The ecological and cultural opportunity of water transport has been allowed to lapse owing to westernisation of the transport system. Road surfaces form a small proportion of the city's area, in comparison with other cities. Land uses, and hence the places between which everyone has to travel, suffer from a severe lack of coordinated planning, which in turn results from the nature of Thailand's political and administrative systems.

Perceptions of the problem

Traffic congestion was the first response of almost all the focus groups when asked what they considered were Bangkok's environmental problems.

> *P1: All around the place, there are traffic jams.*
>
> *P2: And during the rush hours, there are always traffic jams with lines of vehicles unable to move. It might be quicker if one walked to the destination.*
>
> *P3: There is a jam most of the time.*

The people recognised that the number of cars on the road is greater than the capacity of the road surfaces to carry them:

P1: *More cars than usual*

P2: *More cars and more people*

P1: *Cars are increasing despite the fact there is a jam.*

P3: *More cars but with few roads to run on* (Old subdivision, Older adults).

Even the so-called expressways are congested:

P1: *Expressways are like ordinary roads.*

P2: *They are no longer 'express'.*

P1: *We are charged [for using them] too. Although many expressways are to be built, they will not solve the problem* (Inner city: Younger adults).

People pointed out the close connection between traffic congestion and the levels of air pollution and noise. Those in a slum community described the effects graphically:

P1: *Even the trees are dead.*

P2: *Even trees cannot bear it. I doubt the idea of growing trees to minimise air pollution is effective. The trees now standing there are dying.*

P3: *A lot of poisonous gas* (Slum: Younger adults).

The black exhaust from public buses and motorcycles is a major offender:

P1: *It is such a problem if you have to follow a bus since you cannot see anything in front.*

P2: *If we stand behind a bus and face the exhaust!*

P1: *When we rub our faces, oh! Those cars should be forbiden to run!*

P2: *Even a very small motorcycle, its exhaust can blind a large area! Morever, the noise is terrible* (Inner city: Younger adults).

The drivers of hired motor cycles, and their passengers, suffer especially:

P1: *I cannot keep the motor cycle's balance.*

P2: *I cannot open my eyes.*

P3: *During a traffic jam, there is a lot of soot* (Canal community: Younger adults).

P1: *Sometimes I go [to the city] by [hired] motorcycle and then I meet those buses sending out carbon monoxide. My handkerchief (worn as a mask to protect the the face) gets all dirty with the black smoke.*

The high pitched noise of motor cycles is the worst of the noise effects. Motor cycles fill an important niche in the transport system because of their ability to enter narrow sois (lanes) and weave around heavy traffic. They are cheaper than a car to purchase, and cheap

to hire. Despite being illegal and dangerous (yet the allocation of routes is regulated by the police), hiring is a popular informal-sector economic activity.

P1: *Wherever motor cycles go, they bring noise with them.*

P2: *It affects psychological health.*

P1: *It deafens people.*

P3: *It troubles me nearly every night (at work). I really want to curse them.*

P1: *Yes, you have to turn up the TV volume if motor cycles pass your house* (Inner city: Younger adults).

Impacts

The impacts of the traffic, air pollution and noise are unevenly distributed between locations and income groups. The different groups have different opportunities to adapt to the problem, and thus suffer different impacts from the traffic.

The overwhelming impact of the transportation system is on people's time. Car and bus commuters alike make astonishing arrangements to cope, at great expense to their well-being. Even if they have a short distance to travel, they may leave home as early as 5am to ensure faster and more reliable travel time or to secure a car parking place. In order to travel early, a few start work up to two or three hours before their official starting time, and also remain longer at the end of the working day.

P1: *No parking area. We've got to go early to fight for a parking lot.*

P2: *Later than 6am, there is no parking around the Ministries area.*

P3: *No.*

P4: *We've got to fight for a parking lot* (Inner city: Younger adults).

P1: *Some factories cut off part of the wage if workers are late. My daughter's is one. So she runs to work if she is going to be late.*

P2: *In government offices a traffic jam cannot be used as an excuse for being late. ....If there is a traffic jam, you should go out earlier* (Canal community: Younger adults).

Traffic congestion, and the air pollution it causes, are seen as having impacts on both physical and mental health. On the physical side, the people mentioned that they get headaches, eye irritation, infected lungs and heart, and feel weak.

P1: *We have red eyes and corneal ulcers* (Inner city: Younger adults)

P1: *I always get a headache when I go out, [because of] traffic and smoke* (Old subdivision: Younger adults).

P1: *More than anything else, psychological and physical damage.*

P2: *It causes irritability.*

P1: *I got allergic with a runny nose. And got a headache.*

P2: Got dizzy.

P1: Headache and dizzy. Something like that (Slum: Younger adults).

P1: My own experience is that I feel tired easily.

P2: Whenever I go out I have to come back to have a nap. It is not a usual thing since we should not be that tense (Old subdivision: Older adults).

P1: I often get a headache. It is the black smoke (Canal: Older adults).

The traffic causes great stress, which is associated with psychological impacts and behaviour which damages interpersonal relationships. People easily become irritated and lose their tempers.

P1: The more developed the country is, the more people have psychological problems.

P2: They may not know they have psychological problems. However, the most obvious evidence is when one is going to drive a car. Then, one changes his personality to be aggressive.

P3: One of the school teachers bites a handkerchief whenever he drives a car to prevent himself from cursing others. [laughter] (Inner city: Younger adults)

People have little time at home to rest, spend with their families and friends, or carry out their household responsibilities. Meals and preparation for the day are rushed, or carried out on the way to work - Bangkok people have reported feeding their children breakfast and supervising homework in cars. Some working couples have their main weekday chance to talk together on the long car journeys.

P1: Working people have little time to rest. I know, no rest at all.

P2: They cannot rest. Like me, when I come back I'm tired, my wife is also tired. But we cannot rest. It's not like in the past.

P3: No rest at all. There's no time to rest. I'm this old but I've got no time to rest yet.

P4: There is only a short break, only a short break (Slum: Older adults).

Whether people travel at the normal times, or outside peak hours to reduce the time they spend on the roads, the time involved in commuting has severe impacts on their families and personal relationships. Family life is changing as a result of so little time at home, and community life is changing also as people have less time to spend in their neighbourhoods.

The work begins at 8.30 am. but I leave home as early as 5 am. We start to journey back around 6.30-7.00 pm. and arrive home around 9 pm. (Inner city: Younger adults and Older adults)

It is quite common for city people to get up very early in the morning and go to bed very late at night. The focus group participants said they could hardly find time for rest or recreational activities. Because they waste so much time commuting, many of them resort to carrying out essential domestic activities away from home, often on the journey.

P1: Everything is done in cars. If we could move beds into cars, we might do that!

P2: I have my children do their homework at the university [the work place] or have them tutored there. We have to have everything done out of the house. Then, when we reach home, we just take a bath and go to bed. (Inner city: Younger adults)

Because they are so stressed and tired when they arrive home, they do not feel like interacting with other members of the family. *We are moody when reaching home so we are not in the mood to talk.* Younger adults from the inner city community said that they would usually say a few words of complaint about the traffic and then go straight to their bedroom to rest. The quality of relationships in the family was declining. Members of the slum community also said that stresses from traffic, alongside economic hardship, stimulated tension and conflict within the family.

P1: There is a traffic jam. So we come home irritated and quarrel with family members (Slum: Younger adults).

P1: That's quite common. We feel stressed and quarrel among ourselves

P2: The traffic is so heavy, sometimes we are stressed.

P1: Sometimes my wife is the scapegoat. When I come back from work and it gets very hot, I put the blame on her...

P1: These working people sometimes get moody easily when they go home and have to meet heavy traffic. It's a waste of time and they have to hurry. The situation worsens when they arrive home (Slum: Older adults).

People from the old subdivision and slum communities said they were worried about the limited time given to their children, who they hardly saw because they had to leave home very early in the morning and come back very late at night. They mentioned that in some cases *the children do not recognise their father's face* (Slum: Older adults).

P1: Certainly [we get together] less often now. Frankly, it's because everybody has got some work. Some reach home at eight or nine o'clock at night when others are asleep. There's no way they can meet in this way, unlike the old days.

P2: Like my family, when the father leaves home, the children are still asleep. When he comes back in the evening, they have gone to bed. That's not a very good relationship. Children are closer to the mother. Well, they understand that their father goes out to work to earn some money so that they can learn (to pay education expenses). But they are certainly less close (Slum: Older adults).

P1: The children do not meet their father and the father does not see his children.

P2: You cannot go out late in the morning too. You have to go early and the children do not get up yet. So they do not meet.

P1: One of my friends at work said that he has to get up at 4 a.m. to cook rice when his child is still asleep. He said that sometimes he has to sneak out of the job to see his child. His daughter asked where he has been. He doesn't go anywhere, just goes to work (Slum: Older adults).

The people were concerned that the limited time available for family members influenced children's behaviour and the way they grew up. *Because we cannot give enough time to kids, that is why they are changed* (Old subdivision: Younger adults). A slum resident mentioned that since the financial situation was bad, parents could not control their children; they went out to work every day and did not know what their children did at home.

In addition, parents usually could not prepare suitable food in the morning because they had to hurry to work. When the children woke up they ate whatever they wanted. *They do not eat according to the nutritional program so they have bad health* (Old subdivision: Older adults). The participants considered that they were unable to bring up their families in the way they would prefer. For instance, the children in this generation cannot cook rice by themselves because they use electric rice cookers. People have to choose the easiest ways of doing things, so cannot pass on their experience and skills even to their immediate family members.

Time factors also influence working people to adopt some aspects of western lifestyles. For example, instead of having a proper meal in the morning, they choose tea and toast, which can be prepared quickly. One participant said that to avoid the heavy traffic in the morning and evening, she usually had breakfast at the office cafeteria, and dinner at a restaurant. She have meals at home only at weekends (Inner city: Younger adults). People have to do things in a hurry:

> *P1:* *I usually drink coffee in the morning but it is not tasty at all. I have no time to sit and sip. I usually make it and have got to do something else too. Then I hurry back to drink it.*
>
> *P2:* *I nearly don't know how it tastes, or smells, because I have to hurry to work. If I am late there will be a traffic jam. Those who have got cars also get stuck in the jam* (Slum: Older adults).

As well as the economic inefficiencies of lost working hours, delayed meetings and tired employees, there is a serious financial impact on middle-income households, which strive to own cars to save their time and reduce travel stress. Despite their expense, cars are no longer perceived as a luxury. People from the middle income communities (Inner city and old housing subdivision) argued that a car had become a necessity for commuting in the city. They are struggling to buy and run cars so as to avoid the slow and crowded public buses and the severe air pollution. In addition, the growth of the city adds to the demand for car ownership, as those who move to the fringe areas have no other means of transport. Because of the lack of effective control over land use, urban expansion is taking place without sufficient planning, thus aggravating the inadequacies of the public transport network, and causing further traffic congestion in all city areas.

The higher income inner city and old housing subdivision communities are equipped to reduce the effects of traffic, air pollution and noise. They have air-conditioned cars to protect them while they are travelling, and air conditioning at home. This adds to national energy consumption. Meanwhile, those who travel by motorcycles or public buses breathe polluted air constantly and are also exposed to it for longer periods. The highest health risk and discomfort is experienced by the members of the low income groups who depend on these modes of transport.

Adaptation

We are interested in the ways in which people adjust to the time demands and stresses of commuting. Those who travelled by private car said that they had to accept the situation because they could not change the causes. This is a cognitive adaptation - they choose to alter their mental state.

> *Getting up in the morning, I know what I'll be facing. I know where all the jams take place* (Old housing subdivision: Younger adults).

P1: *I have given up. We just have to accept it.*

P2: *We accept it in the end.*

P3: *We solve problems as they arise. I have an air conditioner in my car and do not mind staying inside* (Old subdivision:Younger adults).

They also did everything possible to relax or release their frustrations while they were in the traffic. For instance, they read magazines, listened to the radio or a cassette, or meditated (Inner city: Younger adults; Old housing subdivision: Younger adults and Older adults).

People with cars ensure that they suffer the impacts as little as possible. However, by buying a car then cocooning themselves in air conditioned comfort, they use adjustment processes which collectively add to the traffic-related environmental problems as well as energy use, and have negative impacts on other commuters.

The other common behavioural adaptation is to avoid travel altogether. If they have an option, many would prefer not to go outside at all: *now, I do not want to go anywhere because I feel fed up with the traffic* (Slum: younger adults).

Causes and solutions

The focus group participants identified the increase in numbers of cars as the main cause of the problem*: cars are as numerous as ants... In those days, there were few houses and few cars. Now there are lots of houses, cars, and people. Before, there was just one car for three to four families, but now a family can have two, three or even four cars* (Canal: older adults).

P1: *Cars are increasing despite the fact there is a jam.*

P2: *More cars but with fewer roads to run on* (Old subdivision: older adults).

The people who own private cars complained of the number of other forms of transport - minibuses, public buses, motor cycles and taxis - and their drivers failing to observe road rules. Law enforcement was considered totally ineffective:

> *Drivers don't follow the rules. If the police were to stop and fine them, they would earn a lot in a day* (Old subdivision: Older adult).

Many participants believed that the situation could not be solved easily. No matter how many more roads are built or improved, this would not keep up with the additional number of cars on the road each year. Moreover, slum residents fear that they will be evicted if many more roads are built, because they do not have security over their land:

P1: *People are most affected if new roads have to be built.*

P2: *Land is taken to build roads.*

P1: *They have to reclaim and chase people away, well to do people can buy new pieces of land [but we cannot]* (Slum: Younger adults).

Some were understanding about government inaction:

> *I think the problem of cars ...is insoluble anyway. Think about the taxes the government gets each year. If the government limits the number of cars, it gets no money from taxing. ...If they get no taxes, they don't have money to pay for our salary. And we'll have nothing to eat without a monthly salary* (Canal: Older adults).

The participants were sceptical that people would be prepared to use buses after having cars, even if bus services were improved and traffic jams reduced:

> *P1: I don't think so.*
>
> *P2: Hard to say. Thai people have certain values (driving a car is more prestigious than using a bus)...I don't think that Thai people will put on a suit and necktie then go to work by bus.*

Two postscripts to these community observations are in order, as they present a more optimistic picture of the adaptations possible by government and the general public. Since the focus groups were held in 1989 and 1990, the traffic police have made a concerted effort to regulate traffic flows, which are now more orderly if not actually faster than a few years ago. Traffic police, who are even more exposed to traffic than travellers, are better protected with masks, and have access to respite booths and oxygen tanks on the worst intersections. The head of the traffic police complained in February 1992 that his department could not improve matters further while more cars were encouraged onto the roads by governments favouring the 20 per cent of private car owners over the population of public transport users (*Bangkok Post*, 25 February 1992).

A novel and popular public adaptation is the introduction of an FM radio station devoted to monitoring traffic flows through helicopter observation, and phoned reports from commuters and residents (commuters on their car phones). The station enjoys a very enthusiastic level of participation, as the availability of information and the talk-back sessions provide a release for travellers' stresses. Jakarta has also introduced a similar radio station, but without this degree of public enthusiasm.

Pollution

The floodplain biophysical setting of Bangkok, transformed by societal changes from a water-oriented culture to a modernising and westernising built environment, is also the foundation for a severe water pollution problem.

Perceptions of the problems

Discussion of the issue of water pollution covered the pollution of the Chao Phraya River and of canals (known as klongs). Participants in the focus group interviews were fully aware of the seriousness of the pollution in the Chao Phraya river, having observed floating rubbish and weeds, changes in the colour of the water, and a decline in aquatic life. In agreement with empirical research, they recognised three main sources of pollution of the river: industries, households and restaurants. There was some divergence of opinion as to who should be blamed: riverside residents; migrants; or everyone.

> *People who cause pollution in Bangkok are countryside people. They are used to traditional Thai houses which enable the flood to wash away dirtiness. However, houses nowadays are not built traditionally, so there is always a flood problem and the pollution problem follows. Then, if*

> *you want to solve it, you have to do an educational analysis about how to have people change their habits* (Inner city: Younger adults).

The situation in the canals is less well-publicised but equally critical. Canal water pollution has become an acute health problem for the vast majority of residents of the fringe areas of Bangkok. The majority of these are poor, and their livelihood is still closely associated with the water.

Many agreed that one of the major problems is the lack of a proper sewerage system. The partial system available merely discharges household effluent into the canals, which flow into the river. The majority of houses, which are not connected to any system, also discharge wastes directly into the river or canals. Many communities also lack access to the garbage collection network, so that solid rubbish is also thrown in.

The people said that in the past, they could use the water all year round. The water was *very clear, then, crystal clear* (Canal: Older adults). People used the canal water for all their domestic needs, such as drinking, cooking, bathing, and washing (Canal, Agricultural-based and Slum communities). Although people used the water a great deal, the water could still replenish itself.

> *P1: I used to use canal water for bathing.*
>
> *P2: Also it was used for cooking. Now we use only rain water.*
>
> *P3: There used to be water in the canal all year round* (Canal: Older adults).
>
> *P1: In the past when it did not rain, we fetched water from the canal and kept it in jars for drinking. In the past we could drink water from the canal. ...*
>
> *P2: It was clear and clean. Now it is not so good* (Agricultural-based: Older adults).
>
> *P1: Every year if the tide was very high and the water was clean, I would take my children to play and swim in the water. Now we cannot because it's all muddy* (Slum: Younger adults).

Many factors were seen as contributing to the pollution. The population of each urban community is growing, and crowding affects the water:

> *It is because of the growing community, things have completely changed* (Canal: Older adults).

In the past, when each community was small, there was no pollution problem as fresh water from other places replenished the canal. Now that there are more people, communities are less able to control the throwing of rubbish into canals.

Pollution from factories among the communities is recognised as another major cause of the canal pollution. Together with household rubbish, factories are seen to contribute to the reduction of depth in the canals, reducing water flow (Slum: Younger adults). (During the dry season when tides are low, canals get very shallow).

> *Black water or red water, we could see it clearly, because of the factories' waste water* (Slum: Younger adults).

P1: There are many factories and they have pipes sending out waste water and fumes.

P2: We need a place to treat water first. But these factories, they drain the water into canals. In the future, the water will be polluted (Canal: Older adults).

Participants believed that chemicals are discharged into the water, and that these have not been studied adequately (Slum: Older adults). They were conscious of health risks caused by chemicals to which they are exposed through the use of contaminated water.

P1: In those days, we could just filter the water and drink it. But we cannot do that any more or we'll get cholera. It's polluted, it smells bad. We cannot even use it for bathing since it will make us itch all over (Slum: Older adults).

Impacts

The pollution of canal water has had significant impacts on the people's physical health, behaviour patterns and cost of living. Since the water has become polluted, they are prevented from using it for drinking and washing, but the poorest people still do so when there is no rain water. Those who use the water for cooking rice mentioned that it deteriorates rapidly; *just in the afternoon, the rice is off* (Agricultural-based: Older adults).

The people who live in the agriculture-based community said that they have stomach upsets and diarrhoea after drinking the water or eating rice. They suspected that these symptoms were related to the contaminated water that they used. Moreover, everyone in this community had experienced water-related problems such as itchiness and swollen skin.

Almost everyone in the community gets it because we have to use the canal water for bathing (Agriculture-based: Younger adults).

The lack of running water in the poorer communities makes their life much more difficult. People from the slum community explained that they usually washed their clothes in the canal first and then again with clean water. Since the water is so polluted, they have to buy extra water for this purpose (Slum: Older adults).

Solutions

A few suggestions were made towards solving the problems, such as a law to prevent people from throwing garbage into the water (Canal: Older adults) or that riverside residents should be provided with rubbish containers and a collection service (Inner city: Younger adults).

People from the inner city suggested that a sewerage treatment system should be installed to solve the problem of household wastes. They also said they were willing to pay a tax towards this, provided it was effective.

P1: I do [agree to pay tax].

P2: Me too if it is effective.

P3: Since we pay only a very small extra tax.

P4: But it must be effective (Inner city: Younger adults).

It is doubtful, however, whether a tax or user-pays system would be welcomed by lower income groups.

The people were cynical about the control of factories, believing that most of the factories discharge waste water without treatment. There is legislation requiring all industrial plants to have water treatment plants, but enforcement is problematic: as the plants are expensive to run as well as to install, they run the systems only when they expect an inspection. When asked whether all factories should be moved out of the city, participants thought that the situation might be worse as enforcement would be even slacker elsewhere. They considered, however, that new industries should be located up-country as there is no more room in Bangkok.

Urban land use

The processes of economic growth and urban centralisation continually intensify the use of the land in the inner city area. Meanwhile, rising prices and increasing air pollution drive people to greener and cheaper areas towards the city's fringes, where modern new housing estates are built to entice the middle class.

The increasing demand for residential areas puts great pressure on land throughout the city and the neighbouring provinces. Housing developments and golf course projects are the leading agents in bringing about change in land use on the fringes. Due to the lack of effective land use controls, these new projects have burgeoned at the expense of agricultural and economically marginal areas of the city. Land speculation leads these processes. The communities in the outer zone are being engulfed by urban expansion.

Meanwhile, the communities of the middle zone in particular suffer new population and resource pressures as lower income inner city residents are forced outwards by eviction and rising prices.

Loss of agricultural areas

Farmers explained that several factors contribute to their decisions to sell their land, including the failure of agricultural production resulting from the adverse environment (water and air pollution, breakdown of natural pest control) and unprofitable markets. The increasing land prices, due partly to land speculation, are extremely tempting. People from the agriculture-based community said that they had sold many of their orchards and paddy fields, so there is almost no land left now.

> *The ones who have got land will sell to the people who develop it as housing projects* (Agricultural-based: Older adults).

When they sell the land, they are able to clear their debts and have money to spend on whatever they want. These people usually retain a small piece of land for their own houses but no longer continue farming for a living. There is no concern for those who are able to manage their money and survive by taking up some other employment, but there are many cases in which people cannot manage:

> *People here do not have much land left and spent all the money they got from selling the land* (Agricultural-based: Older adults).

The land is usually subdivided for housing development projects - the participants referred to many being for sale around the canal community.

Members of the old housing subdivision and slum communities described problems of crowding, flooding, and drainage caused by the new housing development projects. The land where houses or townhouses are to be built is usually raised with about a metre of infill, so that the ground levels of these new areas are higher than the existing community's land:

> *Water then flows into the village and becomes rotten [because of stagnation]* (Slum: Younger adults).

These problems of water drainage from the housing development projects have already been experienced in the two slum communities (Slum: Older adults). Also, members of the old housing subdivision community mentioned that the new housing development projects never have proper drainage pipes (Old housing subdivision: Older adults). Another environmental effect observed by those in the old subdivision, is that the reduction in trees and increase in built-up area affects the heat levels, so that there are no longer cool periods in the early morning and late evenings. As a result, people need air conditioning or fans.

Apart from the specific environmental problems, many people mourned the loss of the natural or agricultural environment. Several from the old subdivision community said that they originally moved to the area because of its good environment.

> *I liked it here when I first moved in because there were a lot of trees and it was very shady* (Old subdivision: Younger adults and Older adults).

Others said they moved in because land prices were not very high, and they did not think about the environment at first. However, after staying there for a while, they

> ... *began to like the environment because of the birds and trees* (Old subdivision: Younger adults).

There is little communication between the residents of the new housing developments and the older residential communities. High fences are usually put up surrounding the new estates. The two groups have different lifestyles, and come from completely different socioeconomic backgrounds. There is thus little hope of integration between the two types of habitat, at least in the short term.

The process of urban encroachment on agricultural land has serious impacts upon those who live on rented land. These people expressed their strong concerns about the threat of eviction, either for housing estates or the infrastructure and public utilities which follow (Canal: Younger adults). Some accepted that this is the way of development:

> ... *that is fine as long as they do not come into our land* (Agricultural-based: Younger adults).

Others were really afraid that they, as poor people, would be displaced (Canal, agricultural-based and slum communities).

> *If the land owner sells the land and evicts us, we will be in big trouble as we do not know where to go* (Agricultural-based: Older adults)

In spite of the fact that Bangkok grew out of agricultural settlements, the farming sector which has continued within the metropolitan area and neighbouring provinces has always been neglected by planners. The farms surrounding the city are the major source of fresh

food for the urban population, so the displacement of the agricultural areas results in a serious loss of a food source, and also of green areas for the enjoyment of the urban population.

Some people, mainly those who still had some land which they expected to sell for a favourable price, perceived the increase in new housing development projects within the agricultural areas positively, as a catalyst for development and 'progress' (Canal: Older adults). For example, they would bring electricity and new roads to their community area. They would be able to use cars, and have easy access to public buses.

Slum relocation

The large number of slum and squatter settlements in and around the city are equally at risk of eviction. The continuing process of urban expansion has a substantial impact upon these people, who are inevitably forced to move further out, or to crowd existing settlements. In the outer areas, their land, like the agricultural land, is sought after for new housing developments or golf courses. In the inner and middle zones, the rate of new building means that their sites are cleared for new developments. Slum dwellers seldom own their land. Many of them own their own houses on rented land, and stand to lose these with any change in land use.

P1: Just this morning I was thinking where I would go if they drove me out.

P2: Yes we just talked about it this morning.

P1: Where will we go if they want the land back? Anyway we will have to struggle if they really want it.

P2: We will probably have to sleep at the temple (Slum: Younger adults).

P1, P2, P3: Oh, yes, we've been thinking about that [of being evicted].

P4: And wondering where we will go. We'll be in trouble.

P1: That will certainly happen to us someday.

P3: We'll lose the place to live.

P5: The time is near. I can see that they have been filling up the land nearer to us. Then we'll be driven out into canals.

P1: Let it be. We just have to go on living. If we cannot go anywhere, perhaps we'll have to live along the canal on the government's land. Those old people will finally die (Agriculture-based: Younger adults).

The reluctant merging of lower income populations through this process causes environmental and social pressures in the receiving communities. For example, the long-term residents of the agriculture-based and slum communities are conscious of crowding. In the past there were few people, and the communities were relatively isolated along their canals. Over about the last five to ten years, many more people have moved in. The new have either built their own houses or rented a room in the community.

P1: Certainly, our houses now are roof-to-roof close (Agriculture-based: Younger adults).

P1: Because there are many houses for rent.

P2: *So crowded that a chicken cannot land on the ground* (Slum: Younger adults).

P1: *I don't know what to say. It's their benefit.*

P2: *Crowded. Floods.*

P1: *The air which was so fresh, so clear, becomes less nice. It's not as open as before. And their environment or the way they live. Well, it's certainly more crowded* (Slum: Older adults).

Crowding was seen as the cause of some social problems. Participants suggested that because there are so many more people in the communities, they cannot maintain social control (Agriculture-based and Slum: Older adults). However, most of the social problems they mentioned - theft, drugs and gambling - were not yet seen as particularly serious.

The lower income communities did, however, welcome the improvements to local infrastructure which had been made in their areas. They considered the improvements to roads, walkways, electricity, and running water a sign of progress and development.

P1: *More developed. In the old days, it was so dark, like a cave* (Canal: Older adults).

P1: *The walkways are not flooded any more.*

P2: *It was difficult to walk on the footpaths before. Now, they are fine.*

P3: *There's also electricity. We don't have to walk in the dark at night. There's also running water* (Slum: Older adults).

ECONOMIC CONDITIONS

The participating communities described their economic conditions as being inseparable from environmental conditions in influencing their lives and health conditions. Because of wide income disparities, the majority of the city's population still remains at a low standard of living despite the strength of the economy. The low-income habitats generally have lower environmental quality, and low-income commuters depend on the slowest and most polluted forms of transport. Economic stresses are often inseparable from environmental ones where work and commuting behaviour patterns are concerned, and while the lowest income people suffer worst, middle income people are not exempted.

Sharp increases in the cost of living have hit people at all levels. Participants in all the focus group discussions complained about economic hardship: *the situation is worse because of the high cost of living*. Although the country's economic status is improving, not everyone shares the benefits:

P1: *It's the economy that's the problem. We get very small salaries.*

P2: *The income and the expenses don't meet.*

P1: *We have to spend a lot. For example, schooling for children* (Agriculture-based: Younger adults).

Members of the inner city community confirmed that *the income distribution is very poor* (Inner city: Younger adults) and *people do not earn enough to live on* (Inner city: Older adults). Many participants in the agriculture-based and slum communities reported economic hardship:

> *It's difficult. Goods are expensive. We want to be economical or spend less but we cannot because we have to buy things. Our salary is small. We run out of it very quickly. It's a little easier for those with bigger salaries but some people have to be responsible for three or four other people.* Agriculture-based: Younger adults)

P1: *I don't see them [government] talking about economics. They talk about something else, I don't know what about. Building roads from here to there, they don't think about our living.*

P2: *I don't think they need to do anything, they should just make our living better first before doing anything else. For instance, guarantee our minimum wage so that we can live without trouble. If we have a good living standard we will help the government a lot* (Slum: Younger adults).

Impacts and adaptation

The economic conditions have direct effects on people's health, in worry about paying bills or finding employment, working inordinate hours at second jobs to try to make ends meet, and inability to meet their basic subsistence needs. They interact with environmental conditions, in that those with the fewest means generally suffer the worst living environments. Their housing is of low quality, many lack land tenure, and their locations are generally unfavourable in terms of pollution. They travel by public transport or motorcycle, and thus are exposed to the worst of air pollution, for far longer periods than those who travel by car. They depend more directly on aspects of the environment such as canal water, and they lack the means to escape the unfavourable environment by such measures as air conditioning and noise-proofing their houses, or escaping to the country on weekends.

Members of the slum communities described how inadequate income makes life more difficult. *You are under pressure if you cannot find enough money* (Slum: Older adults). They have to accept low wages because of the high competition for jobs, otherwise they will be unable to feed their families. They pointed out that finding a job is much more difficult for the person who has no skills and less education:

> *Nowadays jobs that used to be for people with an educational background of level 4-6 are for level 10. Jobs are also rare* (Slum: Younger adults).

Although the members of all communities face health problems owing to the stresses of environmental and economic conditions, an important difference between the economic groups is their respective abilities to use leisure to escape or relieve their stresses. Members of the well-off inner city community mentioned that they felt so bored and stressed with their hurried daily routines, that they took every opportunity to get out of the city. It is common for this group of people to take weekends or holidays away from the city. They said that people nowadays want only peace of mind as they never feel at rest while living in the city.

P2: *If I have a long vacation, I go upcountry. It doesn't matter where, just going somewhere else is enough. [laughed]*

P1: *Because of stress, we want to have a change* (Inner city: Younger adults).

However, on their return they again face the same problems of traffic and pollution:

> *Every good feeling gained from the trip disappears when we reach Bangkok.* (Inner city: Younger adults).

Those who live in the slum and canal communities are constrained by economic conditions. They have little time to rest and cannot afford to have holidays. The only pause is while having meals, yet not having enough to eat in itself creates stress. Even when they manage some physical rest, they cannot stop thinking about how to make a living:

> *For the ones like me who do not have enough for survival have to keep worrying until they get a headache* (Agriculture-based: Older adults).

Some people mentioned that they take a nap or do housework as a mean of relaxation:

> *P1: We don't make anything. Perhaps we only cook and sweep the floor. Simple tasks like that* (Slum: Older adults).

Since people have to struggle for their economic survival, work and the work-place come to dominate everyday life. Because people have to spend most of their time at their work-places, they inevitably have less time at home and with their families.

The focus group interviews raised the role of television in coping with urban stresses, and also in contributing to the quality or deterioration of interaction within the family or household. There are different patterns from community to community, related to economic status. The households which can only afford one television set (such as those who live in the canal and slum communities, where almost every household has one) believed that television has an important role in bringing family members together. Watching television is the only time that family members are together, because television is the only cheap entertainment available. In the agriculture-based community, where there are few televisions, community relationships are enhanced because people tend to gather wherever they have access to one. *Just one television but all share it with each other. All are in front of the screen* (Agriculture-based: Younger adults). However, higher income people from the inner city and old subdivision communities considered that television separates family members, because each family member tends to have their own television set in their bedroom.

Participants said that *in the former time, we watched television together but not now* (Inner city: Younger adults). The only possible time that they can see one another is at meal times (Inner city and Canal: Younger adults).

Social problems

Social conditions are also interrelated with environmental ones, as has already been described in relation to the family and community impacts of environmental problems such as traffic and land use change. Economic and environmental conditions together create pressures on valued social qualities such as a sense of community, belonging, and security of people and property.

Social problems were perceived to be increasing: *you cannot leave your house unattended* (Slum: Older adults). The focus group participants believed that there was a higher degree of violence, theft and drugs than in the past, but they admitted that their perceptions were influenced by the media rather than direct experience.

Almost all of those concerned about social problems believe they are caused by poor economic conditions, associated with a decline in moral behaviour (Inner city: Younger adults and Slum: Older adults):

> *If the economic state is better, no one needs to do the wrong thing since nobody wants to take risks* (Inner city: Younger adults).

Since they have no option, people choose the most convenient means of making a living.

P1: *Influential groups.*

P2: *Cost of living.*

P3: *Poverty.*

P4: *Necessity.*

P2: *If they are not very poor, they won't do it* (Old subdivision: Older adults).

One person from a slum group, however, suggested that social problems are not necessarily caused by economic difficulty, but are due to people becoming more extravagant. People want to fight one another to possess luxury goods. People also *get into debt for buying things that others possess, and to support their children's education* (Slum: Younger adults).

Declining behavioural standards were also attributed to the weaker influence of religion among the urban population. In the country for example, *people will just sit down and pay high respect to monks when we see them approaching*. In contrast, *now people don't feel anything and they can just bump into them* [Women are not allowed to touch monks.] (Slum: Older adults). The decline in Buddhist practice was believed to contribute to the decline in social control.

To solve social problems such as drug addiction and crime, participants believed that it is necessary to improve people's economic conditions and their social well-being. In particular, the living conditions of the poor need to be taken into account in any socioeconomic plan and environmental program. This was seen as a government responsibility: *the authorities [government] can do anything to solve the problem* (Slum: Older adults).

Neighbourhood and social contact

Land use and population changes, economic and social conditions combine to affect the social qualities of urban neighbourhoods. Members of all communities talked of a decline in social contact and neighbourhood interaction. One cause is the population changes in established communities, resulting from land use pressures and individual economic hardship. Many people are moving out, while there are also a number of people moving in. People tend not to know each other very well. Those who have lived in the inner city for a long time mentioned that a lot of people have moved in to live in the area. Unlike in the past, they cannot recognise everybody in the community. *Now, sometimes I am taken as a stranger here while I should be the one to take them as a stranger* (Inner city: Younger adults).

The combined effect of everyone's busy lifestyle, as their time disappears on commuting and earning a difficult living, means that people do not have time to get to know their neighbours: *we hardly see one another because we have to do our own business, we have to earn our living* (Old subdivision: Older adults).

P1: I just don't have time.

P2: By the time I arrive home it is too late.

P3: That makes us very tired.

P4: I don't see the face of my neighbour who lives opposite my house.

P1: We always only hear our neighbours' voices.

P4: Now, we don't see friends next door (Old subdivision: Younger adults).

Since people have to spend most of their waking time on the road and at their offices, they tend to spend much of their time with workmates. *Most of us are close to friends at the office because most of our time is spent there* (Inner city: Younger adults). This affects activity patterns after hours as well. People tend to eat out or have holidays with office friends rather than with neighbours.

The pattern applies to those who live in canal and slum communities, which traditionally have strong social interaction, as well as to the middle-income inner city communities. People mentioned that in the past, everybody knew everyone on the same street as they met at some central place in the community such as a *coffee shop. Now the society is rather limited and nobody knows each other because of the way of living* (Canal: Older adults). Many also perceived that economic hardship made people less sociable, particularly among neighbours. In addition they believed that television played an important role in separating them. When there were only a few television sets in a community people would get together to watch programs of common interest. Nowadays, they spend their time watching television in their own homes.

P1: Each one goes his own way, does his own business.

P2: Go out in the morning, come back at night. They do not even stay home during weekends.

P3: The fence separates us. They won't come out to associate.

P2: The fence closes them inside their home.

P4: In the evening, they watch television at home. And the social group becomes more limited. Television gives knowledge. That's undeniable, but it also narrows down the social community (Canal: Older adults).

The lack of community interaction makes it difficult for existing community members to integrate newcomers. The existing community members and the newcomers, who are usually migrants from upcountry, may associate with each other when they become more familiar. However, the relationship between the existing community residents and the neighbouring people in the new housing development projects is problematic. Because of their different socioeconomic status and ways of living, they do not interact with each other at all.

P1: We know them if they live in this community. But for those who live in the housing estates, we don't. (Canal: Older adults)

P1: There are a lot of housing projects over there.

P2: Usually we don't know them, the new-comers.

P3: They came to buy land. We don't really make acquaintance with them (Agriculture-based: Older adults).

CONCLUSIONS

The focus group discussions name most of the same problems and issues as those raised in studies of specific environmental or economic issues, yet give a very different perspective. The people's perceptions and explanations show links between administration, environment, behaviour and personal experience that would not be obvious from statistics or other methods of study. Although the results from just a few groups cannot be assumed to be representative of all of the urban population, they describe vividly how they relate to the complex city system and its problems. Their view is integrative, because their daily and long-term experience with the various aspects of the city system enables them to see linkages.

As well as covering familiar ground in a fresh way, the groups raise issues which have not emerged from the statistical, administrative and academic literature, and had not been anticipated by the researchers. Among these are the importance of economic status, against the backdrop of the country's economic conditions, and the way that economic and environmental aspects combine to affect people's habitats, lifestyles, and hence stresses, means of adaptation, and health.

When we commenced this study, some people were sceptical that it could come up with anything new. The impression was that the problems of Bangkok are all well-known, but no one knows what to do about them. We have found that the main problems **are** well-known in a technical sense, but their impacts on, and importance to, the ordinary citizens are far from known. Nor is much known about people's behaviour patterns, yet the ways in which they change their behaviour in order to adapt to changing environmental conditions have a profound collective effect. The demand for cars, or to live in less polluted green spaces, generate future traffic problems and transformations of land use.

Another contribution of this method is the recognition of income and power differentials in people's experience, and indeed in the classification, of the environmental problems of the city. The environmental problems which are thought to be so well known turn out to be principally those of the inner city, and those which most affect elite groups in the society. Far less is known, or cared, about the effects on the outer areas of the city or the experiences of lower income groups, with the exception of slums, which have the backing of non-government organisations and community development programs.

Until recently, solutions have also been biased towards the needs of elite groups. For a long time, traffic problems were tackled from the point of view of private car travellers, and vast sums were spent on flyovers across the worst intersections and a few overhead expressways. Less costly but less spectacular options, such as improving traffic flow by better traffic management, can be observed to have played an important part since 1988 when planning for this study commenced. The public bus system, still the only feasible alternative for mass transport (which will be expensive to improve), has continued to be neglected although people's avoidance of buses ultimately contributes to the scale of the traffic.

While lower-income people, in this study those who live in canal, agriculture-based and slum communities, take a more parochial view of local and personal problems, they provide perspectives which might not otherwise reach public attention. Bangkok is a human ecosystem. Neglect of any of its elements will tend to perpetuate the existing pattern, whereby attempts to solve one environmental problem often just cause different ones.

Adaptation is an important ecological concept, which our results have shown to affect the continuing transformation of the city. It is only by learning about ordinary people's motivations and behaviour patterns that one can appreciate the changes which result, or are likely to result in future. It is vital to understand the informal processes of transformation of the city, because coordinated planning is virtually impossible in Bangkok. Politicians have short-term horizons (and terms of office) so cannot impose unpopular decisions, and the distribution of responsibilities amongst strongly separatist government departments, arising from the imposition of a pseudo-western form on still-traditional hierarchies and systems of patronage, defies coordination. The city is therefore extended and reconstructed by a series of ad hoc decisions, as industries choose their locations and use financial or political leverage to bypass impediments to their plans, the growing middle-class creates a demand for housing estates and hence the sale of agricultural and slum land, anyone can build or block off a minor road or klong, and the dispossessed rebuild where they can. Thus the unplanned and unguided results of ordinary people's actions, as well as those of powerful groups, are important shapers of urbanisation.

It remains to be seen whether public participation and public cooperation, now considered integral to urban planning and environmental management in the west, are viable for Thailand's culture. Factors such as societal hierarchies, patronage, and Buddhist-influenced relaxed acceptance, would appear to make public participation in the solution of urban problems unlikely. However, there are examples to suggest that local initiative can thrive alone or in partnership with government organisations. Slum redevelopment programs, initially supported by non-government aid organisations then by enlightened programs of the National Housing Authority, and the unsung efforts of low-income communities to improve their own infrastructure through working bees, give models for community participation in urban reform. A publicly initiated litter awareness and behavioural change program called 'Magic Eyes', the succesful model of the national family planning drive in the 1970s and 80s in which acceptability was gained through appealing to the Thai sense of fun, and most recently the traffic radio station, show that Thai society has a creative and lively regenerative capacity which could be tapped.

Later stages of this study will explore the urban change processes described in this preliminary study more systematically, then take a fresh look at the creative policy options which might be available to Thai society.

Economic conditions determine the capacity of people to solve the problems as well as to adapt or adjust to the changing environment. People who have better economic conditions can adapt themselves to the changing social and environmental conditions reasonably well, compared to those who are economically disadvantaged. The poor seem to have the least ability to adapt since they are exposed to numerous constraints. Security of land-tenure, as a basic living condition, is one of the worst restrictions limiting their capacity to survive in the fast growing and dynamic urban system. Meanwhile, although people who have better economic conditions might be able to adapt well in the present environmental conditions, they may also create a further impact on the whole system by, for example, consuming more energy and producing more waste. People's economic and living conditions must therefore be taken into account in the process of solving any environmental problem.
The present combination of economic conditions and the city's environmental problems is likely to have a great impact on social cohesion, family interaction, and individual members of the society. The change in behaviour patterns necessitated by social and economic conditions (such as disparity between incomes and cost of living) and the deteriorating environment lead to a loosening of social organisation and family relations.
At the individual level, both the physical and mental health of the population seems to be at risk. Although the degree of the impact varies from person to person, people's health and well-being are as important as other problems.

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APPENDIX 1

CONCEPTUAL FRAMEWORK AND INTEGRATIVE METHOD

The research project is using a conceptual framework developed by Boyden (1979, 1987) and research teams with which he has worked. The approach underlying this framework emphasises

1. The importance of using integrative methods which ensure that account is taken of the full spectrum of relevant interacting variables (biophysical, human, societal, economic) in assessing existing situations or options for social change.

2. The importance of causal relationships between

   - patterns of use of resources and energy and of waste production (called technometabolism) by human populations

   - the actual life experience (patterns of health and disease, causes and levels of enjoyment and distress, quality of life) in those populations, and of variability in life experience within populations.

3. The importance of the historical dimension in our attempts to understand the present and to plan for the future.

4. The importance of identifying the relevant biological, sociological and hence 'biosocial' principles that contribute to our understanding of how the present situation came about, and to consideration of options for the future.

5. The fact that some aspects of human situations are not easy to quantify. To ignore important intangible variables in societal assessment procedures (because of their lack of quantifiability) is unscientific, because it leads to an incomplete, and consequently misleading picture. (Boyden, for funding submissions for this project, prepared in 1989).

This integrative conceptual approach was first applied to a field study of a human settlement in the Hong Kong Human Ecology Program (Boyden et al. 1981), then in a study of the city of Lae in Papua New Guinea (Jeffries 1979; Dalton 1979; Christie 1980; Newcombe et al. 1980). It is also being applied in an Australian project based in the Centre for Resource and Environmental Studies, known as the Fundamental Questions Program. This has made an ecological and biosocial assessment of the human situation in Australia, and is examining the implications for such aspects of society as the economic system, social organisation, the value system and education.

The framework

The basic framework includes three clusters of variables, which interact dynamically.

Biophysical environment

The biophysical environment is considered to include both natural systems and those transformed by human activities: land and water characteristics, the built environment and land uses, biological components and the productivity of local ecosystems, and air and water quality. The implications of changes observed in this biophysical component of the system will be considered against the background of ecological theory and our understanding of the sensitivities and health needs of ecosystems and of human beings.

Humans

The framework focuses attention on humans as biological beings, and on their personal environments, behaviour patterns and 'biopsychic' states of health and well-being. In particular, consideration will be given to the extent to which changing life conditions satisfy human needs, and to disparities in the population in this regard. Links will be noted between the life conditions of humans, and the state of the biophysical environment.

Society

Culture and society have a key role in changing the conditions of the biosphere and of humans. The framework considers the effects of societal activities (industrial activities, farming, road building) where the links with changes in the biosphere and human life conditions are most clear. Societal activities are considered in the context of the societal processes which give rise to them, which in turn are embedded in societal structures and systems. Among the most relevant societal processes are the functioning of decision-making systems and the social and economic forces affecting them. The social structures and systems considered relevant for this study include Thai social structure and culture, the structure of government, and the nature of the economy. (Boyden and Ross, from funding submissions prepared for this project, 1989).

In this study of Bangkok, the basic framework is elaborated to analyse the role of modernisation, essentially a societal process embracing economic and cultural change, in producing a particular form of urbanisation. This form of urbanisation is exemplified in the nature of transformation of the biophysical environment, the societal processes which influence the development of the city, and the behaviour patterns and well-being of its people. This study departs from its predecessors in Hong Kong and Lae in several essential ways:

1. It places more direct emphasis on the cultural and societal aspects of environmental and behavioural changes

2. It attempts a more dynamic and specific analysis of the interlinkages between the societal, environmental and human variables involved

3. It attempts integration progressively throughout the design and conduct of the research, rather than afterwards. This is achieved through the structuring of the research teams for interdependency, and an emphasis on interaction between them.

Because of the interests and backgrounds of those participating in this study, this project emphasises land use and the nature of the built and agricultural environments, as the key biophysical variables, rather than energy dependence as in the Hong Kong and Lae studies.

Method

The project's objectives and research questions, and the study's components and stages, were listed in the main body of this report (Chapter 1).

The data collection process has been designed to require regular interaction between two research teams, and to promote progressive integration of the findings. The procedure is illustrated in Figure 3. Data from the preliminary study is being used to assist the investigators to delineate the issues for further study using biophysical field surveys and the human 'life conditions' survey (see below).

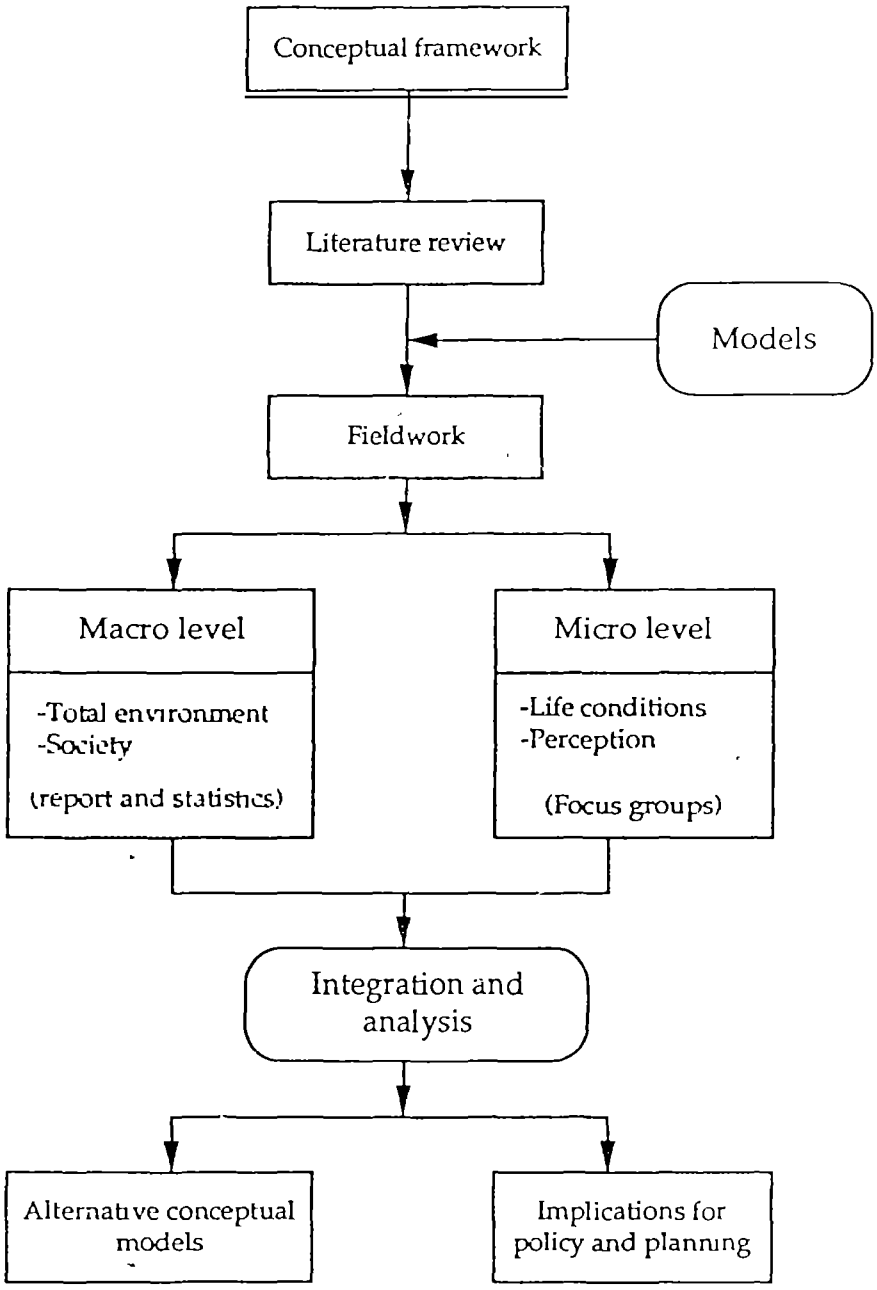

Figure 3 Process of the study

Environment (biophysical) and life conditions (human) surveys and key informant interviews will be conducted concurrently, with the investigators meeting continually to share their findings and views. After preliminary findings have taken shape, a second round of focus group discussions will encourage community input on feasible ideas for resolving the issues. The analyses and findings will be refined and integrated further during the writing-up period.

Research details

Biophysical environment

The data used for the description of the biophysical environment and of the pattern of technometabolism will be derived partly from previously collected statistics and reports. Field survey work, including aerial photography and computer mapping of land-use, and measures of air and water quality, will be necessary to supplement the existing data. Variables for collection include the nature of the built environment and land use patterns; land characteristics including flood proneness, subsidence and land capability; pollution; wastes and disposal systems; and energy consumption patterns. Residents' assessments of their environmental quality will be included within the survey conducted as part of the 'life conditions' research (see below).

Bangkok will be considered as a natural ecosystem, in which land and life forms produce resources, which humans consume, and waste products are - or should be - decomposed. In this context, the 'wastes' include pollution of the water, air and noise. From this information, a spatial index of environmental quality will be prepared over the total area of Bangkok, using a Geographic Information System. The distribution of biophysical as well as societal data will be plotted on maps. Raw data will be given weighted values, and summed scores will be used to identify areas of low to high environmental quality (see for example Rangsiraksa 1981a and 1981b; Department of Urban and Regional Planning 1983; Saengnark 1984; Division of Urban Development Co-ordination 1985).

Changes in land use over time will be mapped from historical data and recent and current aerial survey data, using a Geographic Information System. The underlying economic explanations for changes in land use will be examined, including land cost, rental prices, and the interplays of demand from different types of activity (taking the 'supply' issue of site characteristics into account). The incomes of residents will be considered, as a factor determining behaviour. Different planning measures, such as zoning and building regulations, will be assessed for their effects on land costs and land use outcomes.

Humans

Data relevant to human life conditions (including behaviour patterns and well-being) and perceptions of societal and environmental change will be collected through a representative survey, and focus group interviews.

The first round of focus groups (see below and chapters 3 and 4), conducted in 1989-90, provided the exploratory data towards the research design, especially the survey questions. Twelve sessions were held in seven urban communities (neighbourhoods) to provide community input into the identification and clarification of issues for further investigation, and to show the dynamics of how environmental issues and personal experiences and behaviour are interrelated. The method has provided information reflecting local concerns and the local environment, which will enhance the design of the survey questionnaire. Another twelve focus group discussions will be conducted again after the survey. These will concentrate on identifying changes which could be made to improve the environment and people's well-being. The results of these discussions will supplement the survey and

be used in comparison with those from in-depth interviews with key informants (see below).

The procedure for selecting the communities and individual participants for the focus groups was explained in chapter 3. The structured 'life conditions' survey will be used to obtain representative data on people's actual activities and experience of the environmental issues identified during the first round of focus group discussions. These will include daily activities and time spent on them, personal health, enjoyment of life, personal assessments of local environment and social conditions, and adaptive behaviours. The questionnaire will draw on local concepts and idiom, taken from the focus group transcripts, in the phrasing of questions. The survey will be conducted for 1200 cases.

Society

The purposes of this section of the study are to examine societal processes and activities affecting the urban environment and well-being of its people, and to explore opportunities for change through existing formal and informal societal processes. Thai culture and societal and organisational structure are integral to this examination.

The research will involve an overview of Thailand's societal structure and processes affecting environmental and social decision-making, followed by detail on particular processes and activities affecting environmental issues selected for special study.

Background data will be collected through literature drawing on ethnography, sociology, political science and international relations texts. Specific data relevant to the processes under study will be collected through about 25 semi-structured key informant interviews with individuals and representatives of organisations involved in national decision-making, urban management, and social and environmental reform at national, metropolitan and district levels. The selection of interviewees will include people involved in the formal planning processes - the National Economic and Social Development Board (NESDB), the National Environment Board (NEB), the Ministry of Interior, the Bangkok Metropolitan Administration (BMA), the Department of Urban and Town Planning; politicians, businessmen, non-government reformers, academics, religious and community leaders and pressure groups, staff of relevant non-government organisations and environmental activists. The field survey, particularly mapping of land uses, will identify relevant societal activities, and we expect the focus group interviews and survey of life conditions to do likewise.

The processes through which current environmental and human conditions might be improved will be considered through study of the roles and interactions of parties to decision-making, recognising that some environmental and human changes result from informal processes (such as economic influence or community pressure) rather than explicit decisions. Consideration of formal processes will focus on planning procedures, including the growing role of public participation in Thailand's planning. Less formal processes, not all of which suit Thai culture, include campaigning, personal influence and public opinion.

APPENDIX 2

GUIDELINES FOR FOCUS GROUP INTERVIEWS

The guidelines, or questions, followed in the focus group discussions covered the following areas of people's perceptions and experiences of Bangkok:

1. Perceptions of the Bangkok environment. Questions in this section referred to the participants' assessments of environmental quality in Bangkok as a whole. Discussion concentrated on the causes, impacts, and solutions of traffic congestion, air and noise pollution, water pollution, and flood problems, and also how the people adapt to such problems. The participants were also asked to discuss their attitudes toward changes and development in the city.

2. Perceptions of socioeconomic changes. This was a general assessment of economic and social changes and problems, also at the level of Bangkok as a whole. Participants were asked to discuss the seriousness of social problems and their causes.

3. Perceptions of environmental changes in the community. This section referred to the participants' assessments of the environment of their local community (neighbourhood) in terms of, for example, water pollution, drainage system, water supply system, and garbage collection and disposal. Possibilities for improvement of the community were discussed. Participants were asked to assess the congestion of their areas. Changes in land use around the community, and its consequences, were discussed intensively.

4. Perceptions of social changes in the community. This section dealt with relationships among neighbours. The type of activities and issues of concern among residents were identified and discussed. Participants were asked to assess the social problems of their local community such as crime, aggressive behaviour, drug use, community friendliness and security.

5. Activities and family relations. This section dealt with the participants' assessments of their own home environments. The activities and relationships of family members were discussed, including the role of television in strengthening or weakening family ties and the impacts of environmental problems, such as traffic congestion, on the time people spend with their families. The participants were asked to describe their stresses and pressures resulting from environmental and other problems.

6. Personal health, feelings, and adaptation. This section explored the participants' health status, both physical and mental. The impacts of environmental and socioeconomic pressures upon people's health were included. This section also referred to participants' general feelings and their experiences of enjoyment, fear, anxiety, frustration and deprivation. It included people's senses of personal involvement and belonging. Participants' means of personal adaptation to environmental problems were also explored.

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