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Studies in development and planning Vol. 6

Urban low-income housing and development

A case study in Peninsular Malaysia

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Preface

The research project of which the present study is the end result was initiated in late 1970, while I was affiliated with the Economisch Instituut voor de Bouwnijverheid (Economic Institute for the Construction Industry), Amsterdam, the Netherlands. This institution, in association with the Urban Development Authority, Kuala Lumpur, Malaysia, also supported fieldwork in Malaysia from early 1973 to spring 1975. This resulted in a report to the Malaysian government (Wegelin, 1975), which forms the basis of the present study. Improvement and extension of the earlier report to mould the study in its present shape has been made possible by the financial support of the Stichting Wetenschappelijk Onderwijs in Economische en Sociale Aspecten van Bouwproductie en Bouwnijverheid (Foundation for University Education in Economic and Social Aspects of Construction), Amsterdam, the Netherlands. The support of the above institutions is gratefully acknowledged.

The study owes much to the pioneering work on low-income housing in developing countries bij Charles Abrams and has further been stimulated particularly by the contributions of Leland S. Burns and John F.C. Turner in this field. The recent development of comprehensive cost-benefit appraisal methods for industrial projects in developing countries by Professor I.M.D. Little and J.A. Mirrlees (OECD) and A.K. Sen, P. Dasgupta and S.A. Marglin (UNIDO) provided a challenge to apply similar methods in the area of low-income housing.

I am indebted to many people and institutions for co-operation and data used in this study. The continuing interest of Professor A. Hendriks, who stimulated me to undertake the study and provided moral support throughout the project is very much appreciated.

Of those who co-operated with me in Malaysia I particularly wish to acknowledge the co-operation of Mr. Harchand Singh, encik Ghazali bin Mhd. Ali, cik Hapisah binti Iman Lipat, encik Rusli bin Shamsudin, Mr. Siar Hooi Koon (all of the Urban Development Authority), and Dr. R.

Thillainathan (University of Malaya), who all devoted considerable time and effort to the study and provided valuable advice throughout the field-work period. I am grateful for the assistance rendered by my research staff in the Research and Development Division, Urban Development Authority: encik Hamzah bin Abu Bakar, Miss M. Loganayagi, encik Mhd. Yusof bin Mohammed, cik Sabariah binti Roslan, cik Saadiah binti Badrudin and Mr. Bernard Yuen Wing Seng.

I thank Professor L.J. Zimmerman for his stimulating criticism and advice in extending the original report to the present study. The generous help of Ms.A. van Pinxteren and M.P. Debets in the computational work, as well as the contributions of Messrs. J.G. Waardenburg, F.C.D. van Wijk and I. Wahab, who commented on an earlier draft of the study, is much appreciated.

Finally I owe a debt of gratitude to Hanneke, who during our stay in Malaysia, provided more support than I was able to express my appreciation for.

Regarding the views expressed in this study and possible remaining errors the usual disclaimer applies.

Emiel A. Wegelin

Contents

1. Introduction

1.1. THE CHANGING INTEREST FOR HOUSING IN DEVELOPMENT THEORY AND POLICY

Allocation of resources to housing has long been a controversial issue, both in the literature on development problems and planning and in practice.[1]

At a time when development was still largely identified with economic growth and planning models were generally based on simple Harrod–Domar types of growth models, it was, in retrospect, perhaps not surprising that development economists in the 1950's tended to accord a low priority to housing investment in view of its supposedly high capital-output ratio as compared to investment in other sectors.[2]

On the other hand, already before the Second World War, housing 'reformers' have advocated increased attention to improvement in housing conditions for its own sake. They generally stressed the importance of an increased supply of good housing for low-income groups in terms of social justice and pointed to a number of social ills resulting from bad housing conditions, such as poor physical and mental health, high delinquency rates, to bolster their case.

At the practical level, the limited funds channelled to the housing sector in developing countries had largely been used for commercial housing development, which generally is financially out of reach of low-income groups and consequently benefit only upper and middle-

1. A by now almost classical discussion of this controversy can be found in Abrams (1964), particularly chapter 8. For a more recent statement of the issues involved, see e.g. Burns and Grebler (1976).
2. Appropriately coined by Abrams, 'the devil take housing' theory (p. 106).

income groups.[3] Public spending on housing was generally limited to some token low-income housing schemes (which in many cases did not reach their intended beneficiaries, but were occupied by not-so-poor residents instead) or financial support of residential construction for army officers, civil servants or the like.

During the last decade or so, a gradual change has taken place and today there appears to be a growing consensus that housing investment particularly for and by the lower-income groups is indeed important in the process of development.

Firstly, conventional development concepts and models, as well as statistical concepts used in those models have increasingly been questioned as to their relevance for Third World problems.[4] The preoccupation with economic growth has (perhaps also influenced by environmental problems, which are most acute in the industrialized countries) given way to questions as to who are the real beneficiaries of increased growth and whether those growth patterns are the ones that we really want. Dissatisfaction with the results of economic growth in developing countries has led to increased attention to distributional issues, the selection of specific target groups as desirable beneficiaries of development (e.g. the poorest 40%; Chenery et al. 1974) and the advocacy of a basic needs strategy (International Labour Organization [ILO], 1976), instead of relying on an automatic filtering down of the benefits of economic growth to all layers of society.

The rapid population growth in Third World countries and especially the tremendous pace of urbanization have contributed to this changing perception of development problems, since these phenomena accentuated existing inequalities. Insofar as housing conditions are concerned, these form a physical illustration of the

3. Some economists actually advocate such a housing programme on a massive scale to bolster overall income and employment growth, relying on the 'filtering down' mechanism insofar as housing supply for lower-income groups is concerned. See e.g. Currie (1971).

4. For an early, highly critical review, see Myrdal (1968), particularly the appendices in part III.

appalling poverty of millions of people and a visual reflection of inequalities in income and wealth. As has been noted time and time again, a lack of expenditure on shelter and infrastructure leads to a rapid deterioration of such conditions, which is predominantly felt by the poor. As a reduction of poverty and inequality through taxation and manipulation of the volume of aggregate public expenditure often cannot be achieved effectively there is a case for ameliorating such conditions through changes in the structure of public expenditure, notably by increasingly directing such expenditure at elements of basic needs.

Traditional housing 'reformers' have gradually seen their theses on social ills of bad housing called to question (see e.g. Freedman 1975, Newman 1972). The prime necessity of having at least a roof over one's head with minimal standards of amenity, security of tenure, and location within reach of employment opportunities is increasingly realized. Thinking in terms of incremental improvements as an alternative to providing complete housing units at relatively high standards has dominated the writing of housing specialists during the last few years. The main advantages of such an approach appear to be its better utilization of existing potentialities and a larger spread of the benefits of housing improvement.

In practice increased public participation in economic activities, particularly in investment, combined with the enormous problems caused by the urbanization process has made it inevitable that governments in Third World countries pay increasing attention to the lack of shelter and basic infrastructural facilities, notably in urban areas, and the amelioration of these problems.

The above changes in emphasis are also reflected in increased international recognition of these problems and their possible solutions as shown by conferences like Habitat '76 and by changes in aid policies of individual donor countries as well as bodies like the UN and World Bank group (see e.g. International Bank for Reconstruction and Development 1975a).

All in all, what seems to have emerged is an awareness that more should be done in the field of housing for (particularly urban) low-income groups in Third World countries, but that such increased

efforts need not necessarily take the shape of conventional low-cost housing programmes. Environmental aspects, 'second-best' solutions like site-and-service schemes and upgrading, as well as institutional improvements, including financial mechanisms, warrant increased attention if one aspect of basic needs, the living environment of millions of people in Third World countries, is to be improved in any meaningful sense. This also calls for increased and improved analysis of all available options in the field of provision of shelter and infrastructure, bearing in mind the necessity of using the available scarce resources as effectively as possible.

1.2. APPRAISAL OF LOW-INCOME HOUSING

Against the background of the above controversy and changing views on development and the rôle of housing, the dearth of in-depth studies on this topic is surprising. In fact, arguments raised on both sides in the controversy were largely based on studies carried out in industrialized countries. At the time the research project of which the present study is the end result was initiated, very little information from developing countries was available. The pioneering work by Abrams (1964), impressive as it is even today because of the insight it offers on housing problems in Third World countries, suffers from the lack of concrete evidence on specific issues. This also applies to the writings of Turner (e.g. 1968, 1969, 1972). Both authors have been quite influential in broadly pointing at important issues that should be taken into account in evaluating low-income housing efforts in developing countries. However, there was a virtual absence of comprehensive quantitative studies in a particular developmental setting, covering the main arguments raised in the controversy. A notable exception was the work carried out by the

5. Results are summarized in Burns, et al. (1970). Perhaps predictably, these were rather inconclusive, neither convincingly confirming nor completely disproving the relationship between improved housing and factors such as improved health, improved productivity, lower delinquency and improvement in school performance.

International Housing Productivity Study, which tested some of the housing reformers' claims at various sites in different parts of the world.[5]

During the last few years the information stream has progressively increased, reflecting the increased interest in Third World housing problems by research institutions, governments and international organizations. While some studies are broad in scope and coverage (and of necessity somewhat superficial; see e.g. Dwyer 1975, Burns and Grebler 1976, Grimes 1976), the number of in-depth case-studies has also increased (see e.g. Organization for Economic Co-operation and Development 1973, Vernez 1974, Payne 1977). However, the number of case-studies that discuss low-income housing investment options from the perspective of the efficient allocation of scarce resources is still limited.[6] Yet such studies are of obvious importance if a proper assessment is to be made of the extent to which various alternatives in low-income housing supply contribute to the development of a particular country, as compared to investments in other fields. This requires a study using a cost-benefit framework. A problem inherent in such studies is that they are intended to have a bearing on future resource allocation and are therefore surrounded by a large extent of uncertainty. Clearly, one is on firmer ground when an ex-post evaluation is carried out. The results of such a study, in addition to shedding some light on the quality of investment decisions taken in the past, may provide some guidelines for future allocation of resources to the low-income housing sector and perhaps also indicate roughly what the structure of this housing sector should be like in terms of types of development, location, financial arrangements, etc. It should be stressed that this may well be quite different from country to country, depending on aggregate income levels, overall development aims and policies, resource availability, climatic conditions and other particular characteristics of the country concerned (obviously, there

6. The study by Burns et. al. (1970) has attempted this, but in a methodologically rather unsatisfactory way. A more recent, methodologically sounder example is Hughes (1976). Regrettably that study expressly omits analysis of externalities.

is a world of difference between housing options which are relevant to the tiny but relatively rich island state of Singapore and options available to a huge poor country like India). In other words, the developmental context of any case-study is an important factor and this greatly limits generalization possibilities, perhaps more so than many current studies on Third World housing problems seem to suggest.

1.3. SCOPE AND STRUCTURE OF THE STUDY

The case-study nature of the present study is emphasized by the fact that its core consists of a cost-benefit evaluation of several squatter rehousing schemes carried out by the Malaysian government in the Kelang Valley Area, the main focus of urbanization in Peninsular Malaysia.

However, it would be impossible to put those case-study schemes in their proper perspective without a broad understanding of housing and squatter problems in Peninsular Malaysia or indeed without some knowledge of Malaysian society, its politics and its economy.

For that reason chapter 2 provides an overview of the Malaysian setting. After discussing its location and climate it sketches Malaysia's historical development, followed by a section on recent demographic trends, including the ethnic structure of the population, migration and urbanization. The main structural features of the Malaysian economy are described, emphasizing the extent to which these differ from expected levels for a country of similar size and per capita income as based on international comparisons. Particular attention is paid to the structure of exports, price developments and the labour market. A separate section is devoted to the existing inequalities in income and wealth, as reflected in interpersonal, inter-ethnic, interregional and rural-urban disparities. An understanding of these is necessary to appreciate the nature of current development planning in Malaysia. It is shown how especially inter-ethnic disparities have influenced political developments, which in turn gave rise to a rethinking of development policies,

resulting in the current development strategy of the Malaysian government, the New Economic Policy (NEP), aiming at a reduction of overall poverty and a redress of imbalances. After an overview of early development planning, the NEP doctrine is outlined, while the concluding section discusses how this has been translated into concrete action plans: the Second and Third Malaysia Plans. It is obvious that both housing conditions and housing provision have a bearing on overall poverty levels and on distributional issues. The importance of this is increasingly realized and is reflected in the increased attention given to housing in the current Third Malaysia Plan, 1976–1980 (TMP) as compared with earlier development plans.

Chapter 3 deals with housing in Peninsular Malaysia. After an introductory section, which briefly indicates the range of housing options available and the potential impacts that housing provision may have, aggregate housing demand and supply in Peninsular Malaysia are discussed. Using the 1970 population and housing census as a base some data are provided on overall housing conditions in both urban and rural areas. The problems encountered in estimating housing needs are discussed briefly. It is shown how estimates of housing needs, and particularly their projections in future critically depend on assumptions regarding desirable housing standards, population growth and household sizes. This is followed by a brief review of recent housing construction in Peninsular Malaysia and housing supply estimates for the current TMP period. A substantial part of the chapter is devoted to a discussion of some macroeconomic issues related to housing investment. Problems inherent in the use of capital-output ratios are discussed at some length and some incremental capital-output ratios for Peninsular Malaysia are estimated (both for aggregate investment and housing investment) and compared to data for other countries. Some attention is paid to backward linkages and the income and employment multiplier of housing investment. This is followed by a short section on skills development in housing construction. A discussion on the impact of housing construction on the domestic price level indicates the difficulties of isolating price changes caused by housing, while

its impact on the balance of payments is shown to be partly dependent on the extent to which indirect effects are included in the analysis. The potential mobilization of savings through housing is discussed briefly, followed by an extensive section on building technology options in housing supply. The concluding sections focus on squatter settlements, their prevalence in Malaysian towns, some characteristics of squatters in the Kelang Valley Area, their housing conditions and needs, as well as some problems of present squatter rehousing attempts there.

In the fourth chapter the approach used in evaluating the case-study rehousing schemes is described. The opening section discusses why an ex-post cost-benefit appraisal (CBA) of squatter rehousing attempts is useful. The particular CBA approach used is referred to briefly (it is discussed at some length in appendix A) followed by the selection of cost and benefit items to be included in the analysis. It is important to note here that many of the impacts of improved housing referred to by the housing 'reformers' (see section 1.1.) are internalized by the rehoused households and consequently should not be included in the analysis separately to that extent. However, it is interesting to verify those claims in the Malaysian context and, moreover, some of these indirect impacts generate externalities, which should be included. For those reasons an extensive discussion of housing-related changes in health, in incidence of visits to medical care, in the incidence of fire and crime, in productivity at work and school is provided in appendix B. Such impacts are best estimated with the aid of a before-after test-control framework. The essence of such a design is outlined. The criteria for selection of case-studies and a description of those schemes selected is provided, after which the process of data collection is described briefly. The chapter concludes with a discussion of the environmental changes caused by squatter rehousing, not only in a physical sense, but also as perceived by the residents.

As outlined in appendix A, application of CBA requires estimation of a number of so-called 'national parameters'. These are estimated for Peninsular Malaysia in chapter 5. Considerable attention is devoted to the construction of premium redistributional

weights for net benefits accruing to specified target groups, based on a simple social utility function. The target groups distinguished, as well as the values of the utility parameter used, are derived from the NEP aims and changes in their relative importance during the Second Malaysian Plan (SMP) and TMP periods. An obvious parameter requiring considerable attention is the social discount rate (SDR). Theoretical considerations governing the choice of this rate are explored and the outcome of this is compared to actual capital market rates. Accounting ratios (between accounting and market prices) for all primary factor inputs are discussed and estimated where possible. It is stressed throughout the chapter that the estimates of national parameters are based on a number of assumptions. This necessitates in each case the specification of a range of parameter values which are thought to be realistic.

Chapter 6 contains the results of the case-study analysis for six squatter rehousing schemes. Individual cost and benefit estimates are presented in appendix C for each scheme. Cost estimates provide relatively few problems in spite of the difficulties encountered in finding primary factor proportions. Benefits are surrounded with much more uncertainty: not only are they largely dependent on market-simulated estimates of willingness to pay for housing, but they also pertain to a much larger extent to an uncertain future than costs, the bulk of which have already been incurred during the construction period. The rate of return analysis presented consists of several distinct aspects. In order to assess financial viability of the schemes, financial returns to the government are estimated, based on both actual and potential cash-flows. Efficiency returns are estimated using the SDR values and accounting ratios specified in chapter 5. National economic returns are reached by including discounted values of income redistributional impacts, using the premium weights specified for each target group in chapter 5. The effect of changes in parameter values and in important cost and benefit items thought particularly vulnerable to uncertainty (notably maintenance costs and tenants' welfare benefits) is traced through sensitivity analysis. The chapter is concluded by a discussion of some miscellaneous project impacts which could not be incorpo-

rated in the formal CBA framework. The most important of these in a multi-ethnic society like Malaysia is the extent to which racially integrated rehousing dilutes existing prejudices against other ethnic groups.

The concluding chapter summarizes the results of the case-study analyses and puts forward some suggestions on future resource allocation to the housing sector as well as on financing arrangements. It also discusses generalization possibilities of these results. Finally, some useful avenues for further research are pointed out.

2. Malaysia

2.1. LOCATION AND CLIMATE

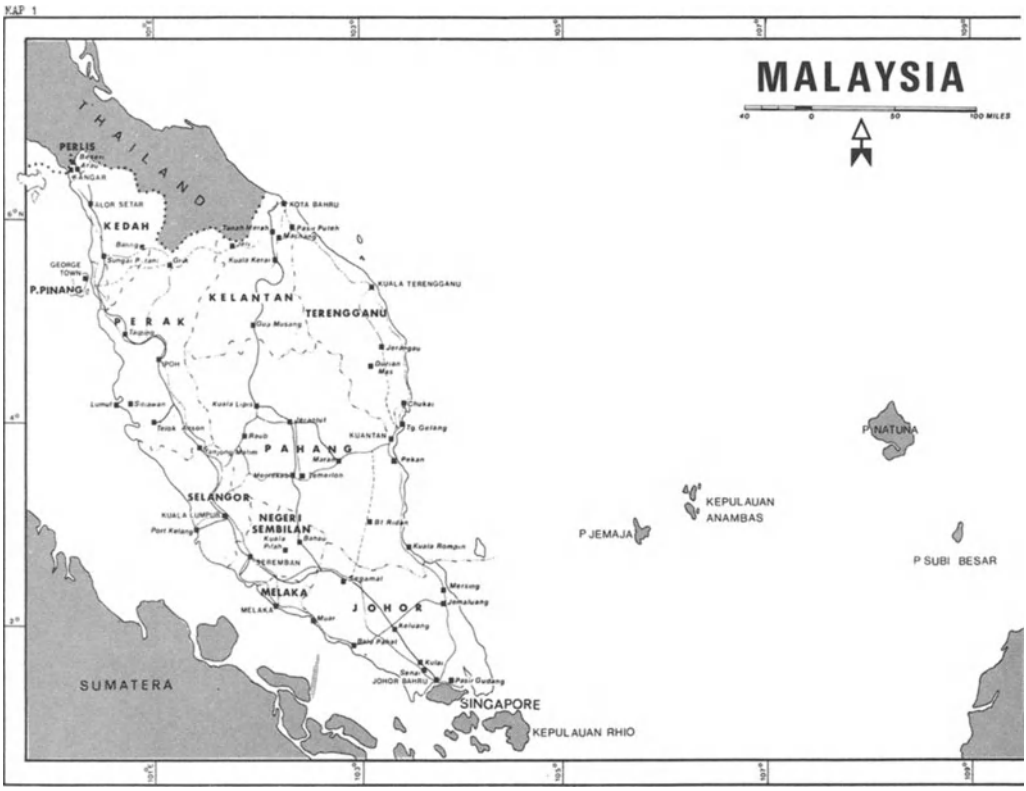
Malaysia (total area approx. 333,000 sq. km.) consists of Peninsular Malaysia (132,000 sq. km., also referred to as West Malaysia which prior to 1963 comprised the Federation of Malaya), Sabah (76,000 sq. km., formerly known as British North Borneo), and Sarawak (125,000 sq. km.). Peninsular Malaysia borders Thailand in the north and is connected by a causeway to the island state of Singapore in the south. The Straits of Malacca separates it from the Indonesian island of Sumatra. Sabah and Sarawak (together also called East Malaysia) comprise the larger part of northern Borneo (the remainder consisting of the independent Sultanate of Brunei), bordering Indonesian Kalimantan in the south. The two East Malaysian states are separated from Peninsular Malaysia by the South China Sea (see map 1).

Malaysia's location between 1° and 8°N. and its nearness to the open sea gives it a tropical climate of high humidity, plentiful rainfall (average of approx. 250–300 cm. annually) and a uniformly high temperature throughout the year (a mean maximum of 29°–32° C in the day and a mean minimum of 22°–24° C at night in the coastal plains).

2.2. HISTORICAL PERSPECTIVE[1]

The earliest known inhabitants of Peninsular Malaysia were Negritos[2] who between 2500 B.C. and 1500 B.C. were forced into

1. For a comprehensive text, see e.g. Ryan (1969).
2. Today known as 'orang asli' or aboriginees, numbering about 53,000 in the Peninsula (1970). They are thought to have a common descendency with the Australian and New Guinea aboriginees dating back from the Ice Age (about 200,000 B.C.)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KELANTAN
TERENGGANU
PERAK
Ipoh
Jerangau
Chukai
Kuala Lipis
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Raub
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Temerloh
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KUALA LUMPUR
Port Kelang
NEGERI SEMBILAN
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JOHOR
Mersing
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JOHOR BAHRU
Pasir Gudang
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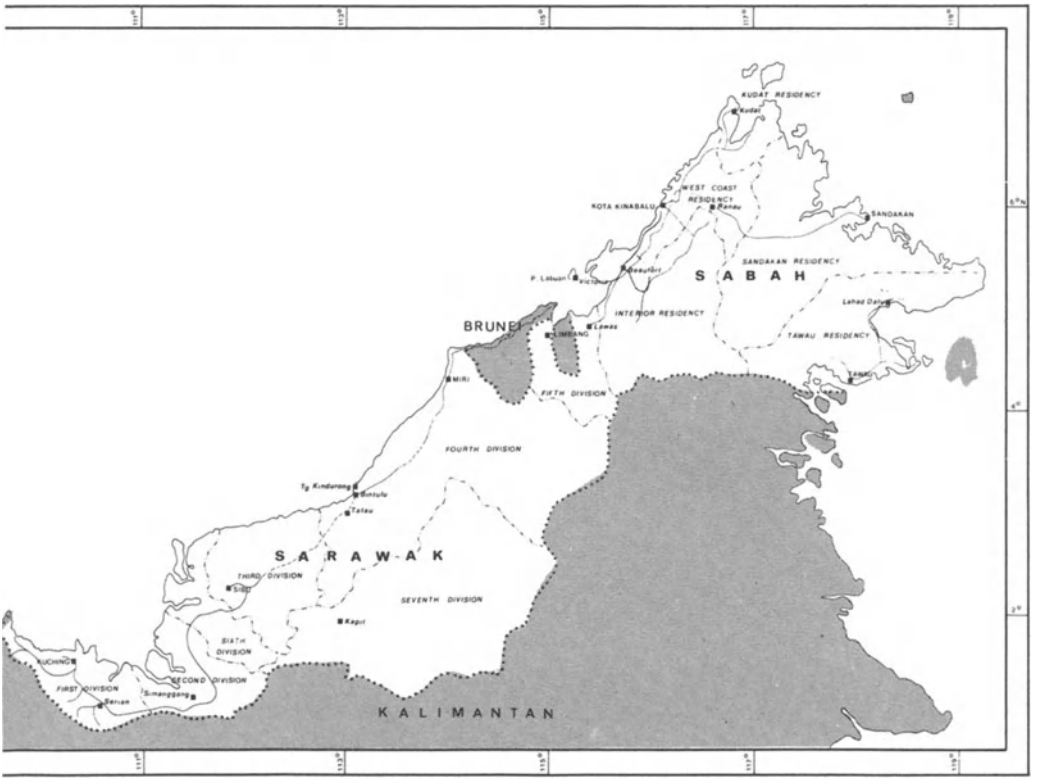
P JEMAJA
KEPULAUAN ANAMBAS
P NATUNA
P SUBI BESAR

Map 1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Kudat
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KOTA KINABALU
Papar
SANDAKAN
SANDAKAN RESIDENCY
P. Labuan
Beaufort
S A B A H
Lahad Datu
INTERIOR RESIDENCY
BRUNEI
LIMBANG
Lawas
TAWAU RESIDENCY
MIRI
FIFTH DIVISION
FOURTH DIVISION
Tg Kidurong
Bintulu
Tatau
S A R A W A K
THIRD DIVISION
Sibu
SEVENTH DIVISION
Kapit
SIXTH DIVISION
KUCHING
FIRST DIVISION
SECOND DIVISION
Simanggang
Serian
K A L I M A N T A N

the hills and jungles of the Peninsula by invaders from southern China (Yunnan), known as Proto-Malays. From these the Dayaks in Sarawak are descended. In Peninsular Malaysia a new wave of immigrants from Yunnan, the Deutero-Malays, displaced the Proto-Malays about 300 B.C. Like the earlier migrants, they spread from the peninsula to the other islands in the Indonesian Archipelago. The Deutero-Malays and subsequent waves of immigrants from Java, Sumatra and other islands in the archipelago in later centuries formed the ancestors of the present Malay population. These were the people Chinese and Indian traders found during the early centuries A.D. Although China at that time was a powerful state, Indian influences predominated, notably in Peninsular Malaysia. In the fourth century permanent trading settlements were established in Kedah. Although there was no large immigration of Indian settlers, these people popularized their way of life and their religion; Buddhist and later Hindu civilization was introduced in Malaysia. This was further strengthened during the dominance in the Malaysian region of the Sumatran Srivijaya (700–1200), Thai Sukhotai (1200–1400), and Javanese Majapahit (1200–1400) kingdoms.

The influence of Islam in Malaysia initially spread from India via North Sumatra during the hegemony period of the Malacca Sultanate (1400–1511) on the Peninsula and the rise of the Brunei Sultanate (early fifteenth century) on North Borneo.

In 1511 the city of Malacca was captured by the Portuguese and the Malaccan sultan fled to Johore where a new sultanate was founded, as also subsequently in Perak. Many Malaccan merchants moved to Acheh or Brunei, where the sultanate gradually expanded its sovereignty to the whole of Borneo, the Sulu Archipelago and the southern part of the Philippines. Except in Malacca itself the long-term Portuguese influence in Malaysia was limited, the Portuguese using Malacca mainly as a fortress and naval base to control trade in the Straits.

The sixteenth century history of Peninsular Malaysia saw rivalry between the Sultanates of Acheh (which gradually extended its influence on the Peninsula by conquering Perak and Pahang) and Johore, while both also in vain tried to remove the Portuguese from Malacca.

This only succeeded after Dutch influence had been built up in the Indonesian Archipelago (trading posts at Banda, Amboina and Batavia) to control the spice trade in the region. The elimination of the influence of a rival European trading nation was the inevitable final step towards a regional trade monopoly. In 1641, after a long siege, Malacca was captured by joint Johore-Dutch forces. The Dutch held the city of Malacca for over a century and a half, yet their influence on the inhabitants of the peninsula was perhaps even less than that of the Portuguese. The city was only used to enforce the Dutch trading monopoly and as a secondary collecting point for their merchandise. The mainland of present day Peninsular Malaysia was dominated by the re-ascending sultanate of Johore (except for Perak and the northern states, which were under the suzerainty of Siam), while North Borneo was dominated by Brunei, its influence declining however towards the end of the seventeenth century. This period also witnessed the beginning of the emigration of Bugis from Celebes to what is now Selangor, while earlier a substantial number of Minangkabau from Sumatra had settled in the area now known as Negri Sembilan. The Bugis also gained considerable influence in Johore, Kedah and Perak. In order to counter the Bugi marauders in Kedah, its sultan turned to the British for help in return for a trading settlement in Kedah. Although the British initially declined, this later lead to the establishment of a British settlement in Penang. Towards the end of the eighteenth century disunity prevailed: the Bugis' influence in the Malayan Peninsula declined after several defeats at the hands of the Dutch, who, however, themselves grew weaker in view of the worsening financial position of the Dutch East India Company.

Meanwhile the British East India Company had set up a trading settlement in northern Borneo as a link in their tea trade with China. But this settlement, while it could be used for refitting, revictualling and protecting their merchant ships, did not satisfy two other considerations important to the British – the need to have a naval base on the east side of the Bay of Bengal, and the possibility of expanding British and Indian trade in the Malaysian Archipelago, particularly to obtain tin to sell to China. After renewed negotiations with the sultan of Kedah, a British settlement

was established on Penang Island in 1786. During the Napoleonic wars the British occupied the Dutch possessions in South-east Asia. This included Malacca (1795), which was returned to the Dutch after the wars were over, together with the other Dutch possessions in the archipelago. This reinstatement of Dutch reign, coupled with the wish to break Dutch control of trade in the area led to the establishment of Singapore (1819), which grew very rapidly as a free trade post. In 1824 Dutch and British spheres of influence in the archipelago were demarcated and this led to an exchange of the settlements of Bencoolen in Sumatra with Malacca, which thus came definitely under British rule. The Straits Settlements, as the three British settlements along the peninsula were to be called, served primarily to protect the trade route to China and this explains the initial lack of interest in the Malay states on the part of the British. This meant that the northern states continued to be dominated by the Siamese, while the other states on the peninsula grew increasingly independent. In Borneo meanwhile, a revolt in Sarawak (still nominally under the Brunei sultan) was put down with aid of a British adventurer, James Brooke, who was made governor of Sarawak by the Sultan of Brunei subsequently in 1842. This marked the beginning of the rule of the Brooke family (the White Rajas) over Sarawak, which was to last for over a hundred years, during which the Sarawak territory was gradually extended at the expense of Brunei. British official interests in Borneo were limited to the establishment of a naval base on the island of Labuan in 1847.

During the 1850's and 1860's increased trading possibilities in the Straits Settlements and tin-mining in Perak and Selangor brought many Chinese immigrants to the Malayan Peninsula. Increased mining activities also triggered greater British involvement in the affairs of these two Malay states – British mining investments had to be safeguarded and civil wars between secret societies among the Chinese miners also had to be contained in order to prevent this from spreading to the largely Chinese inhabited Straits Settlements. However, in view of the expense involved, the British government wanted to limit its overseas involvement and for that reason the so-called 'residential' system was introduced. This system of indirect

rule meant that in each mining state a British 'Resident' was appointed to advise the sultan on all matters except Malay religion and custom. Since the sultans were compelled to act upon their advice, the Residents effectively ruled the states through the sultan. In 1874 Residents were appointed to the states of Perak, Selangor and Sungei Ujong, in 1888 Pahang followed while Johore had a special relationship with the Straits Settlements' authorities with as yet no Resident. A similar system was set up by the British North Borneo Company in North Borneo from 1881 onwards and until 1888 a scramble between Sarawak and North Borneo for the remaining territory of Brunei took place, which only ended when Britain declared all three territories a protectorate.

Towards the end of the nineteenth century the need for consolidation of British rule over the peninsular states became apparent and in 1896 the Federated Malay States (comprising Perak, Selangor, Negri Sembilan and Pahang) came into being, with Kuala Lumpur (which was established in 1857 as a mining village at the confluence of the Kelang and Gombak rivers) as the federal capital. A major result of federation was the shift in emphasis from indirect to more direct rule by the British. The influence of both sultans and Residents declined and major decisions were now taken by the federal bureaucracy. Gradually British influence increased in the non-federated states on the Peninsula and in 1909 British Residents were formally appointed to those states, having much the same position as those in the Federated Malay States before 1896. The last state on the peninsula to accept such an adviser was Johore. In 1914 a Resident replaced the numerous unofficial advisers the sultan had had hitherto from Singapore. In 1906 a British Resident had been appointed to Brunei and in the same year the island of Labuan became part of the Straits Settlements.

Thus at the outbreak of the First World War the colonial pattern of administration had been firmly rooted, both on the peninsula and in North Borneo. This was to remain essentially unaltered until the Japanese invasion in 1941.

As mentioned above, development of tin-mining had been a major reason for British intervention in the affairs of the peninsular

states after 1850. This mining activity increased considerably in the early twentieth century. At the same time rubber planting rapidly emerged as an important cash crop and for many years tin and rubber were to remain the export pillars of the peninsula, while in Borneo the states of Sabah and Sarawak depended on revenue obtained from timber, pepper and copra, as well as rubber.

During the first twenty years of the twentieth century substantial immigration of Chinese and Indian labourers took place in Peninsular Malaysia, the Chinese mainly to work in mines and on Chinese-owned plantations, the Indians to work on European-owned plantations and in government service. Thus by 1920 the present-day plural population pattern had been largely established. In Borneo attempts to import foreign labour were not very successful and the Chinese population in Sabah and Sarawak only grew substantially after the Second World War.

Political nationalism grew during the inter-war years, both among the Malays and the immigrant groups. Already before the Second World War the first Malay political parties had been established.[3] Although during the Japanese Occupation Malay political activity continued, it received its greatest impetus in 1946 when the British introduced their Malayan Union proposal and were eventually forced to settle for a less centralized concept – the Federation of Malaya, established in 1948, comprising all the peninsular states plus the straits settlements of Malacca and Penang. In Borneo both Sabah and Sarawak became British Crown Colonies in 1946. The late forties saw the emergence of the major political parties along racial lines on the peninsula which have dominated Malaysian politics until today: United Malay National Organisation (UMNO, 1946), Malayan Chinese Association (MCA, 1949) and the Malayan Indian Congress (MIC, 1946). These parties backed the British in the protracted 'emergency' warfare against the Malayan Communist Party (MCP) guerillas (1948–1960) and together formed the Alliance Party, which won the first general elections on the Peninsula in 1955. This three-tiered party, heavily dominated by UMNO,

3. For an excellent discussion of the development of Malay nationalism, see Roff (1967).

subsequently formed the first government, leading Malaya to political independence in 1957.

The question of an administrative merger of Malaya and Singapore had already been under discussion for more than a decade when Singapore achieved internal self-government in 1955. Yet it was to take another eight years before this 'natural' merger took place in the context of the formation of Malaysia in 1963, comprising Malaya, Singapore, Sabah and Sarawak (Brunei opted out). The new state immediately had to face a hostile external environment in the form of confrontation with Indonesia: border skirmishes took place in Sabah and Sarawak, Indonesian propaganda aimed to rouse communal conflict, and air and sea landings took place in Johore. Confrontation activity was abruptly stalled by the attempted coup d'état and its aftermath in Indonesia in 1965. In 1966 a peace agreement was signed in Jakarta.

Internal tensions between the Malaysian Federal Government and Singapore had already developed shortly after formation of the Federation and in 1965 Singapore reluctantly left the Federation and became an independent republic.[4]

2.3. DEMOGRAPHIC TRENDS

2.3.1. Population size, growth and projections

The most recent population census, carried out in 1970, has been the first census covering all Malaysian states at the same time. Prior to that, population censuses had been carried out after the Second World War for Peninsular Malaysia in 1947 and 1957 and for Sabah and Sarawak in 1960. The more limited availability of population information for these states hampers comparability of population trends. For that reason some of the data provided below apply to Peninsular Malaysia only.

Table 2.1 provides a summary overview of the population position in 1970, illustrating its ethnic plurality. It should be noted that

4. For a discussion of post-war political history of Malaysia see M. Noordin Sopiee (1974).

TABLE 2.1. Population, Malaysia 1970 (in thousands).

Ethnic group	Peninsular Malaysia		Sabah		Sarawak		Malaysia	
	persons (.000)	%	persons (.000)	%	persons (.000)	%	persons (.000)	%
Malay	4,411	50.0	18	2.7	183	18.7	4,612	44.1
Indonesian	223	2.5	40	6.1	3	0.3	266	2.5
Dayak	–	–	3	0.5	386	39.5	339	3.7
Kadazan	–	–	185	28.2	–	–	185	1.8
Other indigenous	53	0.6	234	35.7	103	10.5	390	3.7
Total indigenous	4,637	53.1	480	73.2	675	69.0	5,842	55.9
Chinese	3.122	35.4	140	21.3	294	30.1	3,556	34.0
Indian	933	10.6	7	1.1	3	0.3	943	9.0
Others (including wayfarers and people afloat)	80	0.9	29	4.4	6	0.6	115	1.1
Totals	8,822	100.0	656	100.0	978	100.0	10,456	100.0

Source: Department of Statistics, Malaysia (1972), Community groups, 1970 population and housing census of Malaysia, tables 1 and 2, pp. 45–104.

a post-enumeration survey estimated that an underenumeration of approximately 4% applied to Peninsular Malaysia (Department of Statistics, Malaysia 1974a). Adjusted 1970 population for Peninsular Malaysia therefore amounts to 9,175,000. No post enumeration survey was carried out in Sabah and Sarawak. Assuming no underenumeration in those states implies a total 1970 population of Malaysia of 10,809,000; assuming similar undernumeration as in Peninsular Malaysia yields a total figure of 10,874,000.

Population density in 1970 was much higher in Peninsular Malaysia (67 persons per sq. km.) than in Sabah (9) and Sarawak (8). Total number of households was approximately 1.6 million in Peninsular Malaysia, 0.1 million in Sabah and 0.2 million in Sarawak with average household sizes of 5.6, 5.4 and 5.8 respectively.

Average annual population growth in Peninsular Malaysia has been 2.5% during the 1947–1957 intercensal period and 2.6% between 1957 and 1970. In Sabah this was 3.7% from 1960 to 1970, and in Sarawak 2.7%. For Malaysia as a whole this works out at approximately 2.7% from 1960 to 1970.[5] By international standards this is a fairly high growth rate. Estimates for other South-east Asian countries during a comparable period are generally lower, with the exceptions of Thailand (3.1%), the Philippines (3.0%) and Brunei (4.2%) (World Bank Atlas 1975, pp. 6, 16 and 22).

In Peninsular Malaysia all vital rates underwent considerable declines during the last intercensal period (for the East Malaysian states no such data are available): the birth rate declined from 46.2 per 1,000 in 1957 to 32.2 in 1970 and the death rate from 12.4 to 6.9.

It has been estimated that during the Second Malaysia Plan period (1971–1975) total population has grown by 2.6% per annum to approx. 12.3 million in 1975. Targetted population figures for benchmark years in the remainder of the Perspective Plan period (1970–1990) are 14.1 million in 1980, 16.1 in 1985 and 18.2 in 1990, implying growth rates of 2.7% during 1976–1980 and 2.6% thereafter. Govern-

5. These and subsequent growth percentages are all annually compounded average growth rates. Some authors use a 'straight' average growth rate instead (percentage change over the period divided by the number of years of the period). See e.g. Department of Statistics, Malaysia (1972a, p. 13), Pryor (1973), Ooi Jin Bee (1975). This serves little purpose and is confusing.

ment of Malaysia 1973, pp. 64, 66 and 1976 pp. 66, 68). These targets fall in the medium growth range of population projections carried out by the Department of Statistics, estimating the population of Malaysia between 17.2 and 19.5 million in 1990 under various alternative fertility assumptions (Department of Statistics, Malaysia 1974b). Obviously, estimated population growth rates are of prime importance to projections of housing requirements (section 3.2.1).

2.3.2. Regional population distribution, Peninsular Malaysia, 1970

Data on regional population distribution in Peninsular Malaysia have been tabulated below (table 2.2). Its salient features are contrasts between east-coast and west-coast states, both in terms of ethnic composition and population density.

The west-coast states, especially Penang, Selangor, Malacca and to a lesser extent Kedah, Perlis, Negri Sembilan and Perak have comparatively high population densities. With the exception of Kedah and Perlis, these states also have a relatively high percentage of non-indigenous population.

On the other hand, the east-coast states (particularly Kelantan and Trengganu) combine a high proportion of Malay population with a low population density. Such differences in population patterns could be expected in view of the diverse colonial history of the states (straits settlements, development of tin-mining and rubber planting). As will be seen below this pattern is also related to the degree of urbanization and levels of income. All these factors influence regional differences in housing requirements.

2.3.3. Urbanization and migration, Peninsular Malaysia

Urbanization may be defined as the process of population concentration in towns and cities, i.e. in urban areas.[6] This implies that to describe the degree of urbanization at any point in time a definition of urban areas must be given in quantitative terms. In the 1970 population census of Malaysia, urban areas were defined as gazetted areas (i.e. listed in H.M. Government Gazette, Malaysia) having a

6. Ooi Jin Bee (1975, p. 40). Compare e.g. Friedman (1973, pp. 65–66), Jakobson and Prakash (1971, pp. 15, 20, 58, 161).

TABLE 2.2. Population by state and ethnic group, Peninsular Malaysia, 1970, (in thousands).

State	Malays and other indigenous		Chinese		Indians		Others*		Total*	
	Absolute (.000)	% of state pop.	Absolute (.000)	% of state pop.	Absolute (.000)	% of state pop.	Absolute (.000)	% of state pop.	Absolute (.000)	per sq. km.
Selangor	564.0	34.6	754.3	46.3	298.9	18.3	13.5	0.8	1,630.7	199
Perak	676.0	43.1	666.2	42.5	222.7	14.2	4.2	0.2	1,569.1	76
Johore	682.5	53.4	503.0	39.4	85.3	6.7	6.2	0.5	1,277.0	67
Kedah	674.7	70.7	184.3	19.3	80.4	8.4	15.4	1.6	954.7	101
Penang	237.8	30.7	435.4	56.1	89.3	11.5	13.0	1.7	775.4	765
Kelantan	637.0	92.8	36.7	5.3	5.3	0.8	7.3	1.1	686.3	46
Pahang	309.0	61.2	157.7	31.2	36.7	7.3	1.6	0.3	504.9	14
Negri Sembilan	218.4	45.4	183.4	38.1	77.6	16.1	2.1	0.4	481.5	72
Trengganu	380.8	93.9	21.7	5.4	2.4	0.6	0.5	0.1	405.5	31
Malacca	209.5	51.8	160.1	39.6	31.6	7.8	2.9	0.8	404.1	243
Perlis	96.0	79.4	19.6	16.2	2.4	2.0	2.9	2.4	121.0	151
Peninsular Malaysia	4,685.8	53.2	3,122.4	35.4	932.6	10.6	69.5	0.8	8,810.3	67

Source: Department of Statistics (1972), *Community groups, 1970 Population and Housing Census of Malaysia.*
*excluding wayfarers and people afloat (9,600).

population of 10,000 or more (see Department of Statistics, 1972a, p. 23). While acknowledging the arbitrary nature of any such cut-off point, this definition will be adhered to below.

In 1970, 28.7% of the population of Peninsular Malaysia lived in urban areas as defined above; for Sabah and Sarawak percentages were 16.5 and 15.4 respectively. This indicates that urbanization as yet is of much more limited importance in the East Malaysian states, which is further reflected in the fact that there was no town that would classify as metropolitan (population of over 75,000) in either state in 1970.

The average household in Peninsular Malaysia consisted of 5.6 persons in 1970; average urban household size was 5.9 and average rural household size 5.5.

Urban growth in Peninsular Malaysia seems to have slowed down somewhat during the last intercensal period (table 2.3), but this aggregate picture is somewhat deceptive. First of all, the impact of the 'emergency' (1948–1960) is reflected in the urbanization pattern during 1947–1957. MCP guerilla activities during this period, mainly aimed at rural Chinese, drove many to urban areas for safety reasons. At the same time the government carried out a scheme to resettle rural Chinese in so-called 'New Villages'.[7] It has been esti-

TABLE 2.3. Urban growth, Peninsular Malaysia (1921–1970).

Census year	Total population	Percentage of urban to total population	Number of urban centres
1921	2,907,000	14.0	11
1931	3,788,000	15.0	16
1947	4,908,000	18.9	22
1957	6,268,000	26.6	38
1970	8,810,000	28.7	49

Source: S. Narayanan (1976, tables II.3 and II.4, pp. 32–33), based on census data.

7. Scattered rural Chinese were a major problem for the government in fighting the guerillas, being not only the major targets in killings but also a source of information and food to the insurgents (who themselves were mainly Chinese). Their resettlement in about 450 New Villages throughout the Peninsula, which were surrounded by fences and heavily guarded, enabled the government to protect the settlers and at the same time to limit the flow of information and food to the guerillas. The most direct effect

mated that approximately one million people moved as a result of the guerilla warfare.

The immediate impact of the emergency was a tremendous growth of urban population during 1947–1957. But its impact on the ethnic population distribution along rural-urban lines has been even more dramatic. The fact that rural Chinese population registered a net absolute decline (from 1,299,000 in 1947 to 1,290,000 in 1957) in the face of total Chinese population growth of 449,000 (from 1,885,000 to 2,334,000) on the peninsula during the intercensal period, further aggravated the already existing urban-rural ethnic disparities (table 2.4).

During the intercensal period 1957–1970, the faster population growth among Malays than among Chinese and Indians (table 2.5) mitigated ethnic disparities in urban areas, but increased them in rural areas.

The higher urban than rural growth percentage suggests that substantial rural-urban migration must have taken place during the intercensal period (assuming equal natural growth; in fact natural growth rates are somewhat lower in urban areas than in rural areas). However part of this differential is explained by technicalities inherent in the definition of urban:

—some gazetted areas previously classified as rural have crossed the 10,000 population mark over the period (which, however, may partly be caused by in-migration);
—some town boundaries have been extended during the period, absorbing the existing population of the areas incorporated, as well as natural growth and possible in-migration;
—urban population increase is also caused by the inclusion of former rural areas as urban, having similar effects as the extension of town boundaries.

Footnote 7 (continued)

of New Village development of course has been a tremendous growth of Chinese population living in settlements between 1,000 and 10,000 population. See Saw Swee Hock (1972, table 5).

TABLE 2.4. Urban-rural population distribution by ethnic groups, Peninsular Malaysia.

	Urban areas			Rural areas		
Census year	1947	1957	1970	1947	1957	1970
Ethnic group	(%)	(%)	(%)	(%)	(%)	(%)
Malays and other indigenous	177 (19.0)	350 (21.0)	699 (27.6)	2,251 (56.6)	2,765 (60.1)	3,987 (63.5)
Chinese	586 (63.1)	1,044 (62.6)	1,479 (58.4)	1,299 (32.7)	1,290 (28.0)	1,643 (26.2)
Indians	137 (14.7)	213 (12.8)	324 (12.7)	394 (9.9)	522 (11.3)	609 (9.7)
Others	30 (3.2)	60 (3.6)	28 (1.3)	35 (0.8)	24 (0.6)	41 (0.6)
Total	930 (100.0)	1,667 (100.0)	2,530 (100.0)	3,978 (100.0)	4,601 (100.0)	6,280 (100.0)

Source: Department of Statistics, Malaysia (1972, tables XIII and XVI, pp. 31 and 33).

TABLE 2.5. Average annual population growth (%) by ethnic group, Peninsular Malaysia (1957–1970).

Ethnic group	Urban areas	Rural areas	All areas
Malays and other indigenous	5.5	2.9	3.1
Chinese	2.7	1.9	2.3
Indians	3.0	1.2	1.8
Total (incl. others)	3.3	2.4	2.6

Source: table 2.4.

An off-setting factor is that gazetted town population understates the true urban population to the extent that this urban population has settled outside town boundaries.

As shown in table 2.3, the number of urban centres has increased by 11 during 1957–1970. Of these, eight have passed the 10,000 population mark during the period and the other three were former rural areas gazetted as urban. Excluding these eleven centres and making adjustments for boundary changes results in an average annual population growth percentage of 2.6 for both urban and rural areas in 1957–1970 (see Soon Lee Ying, 1976, pp. 98–100).

However, it is interesting to observe that the practice of not including urban population living in built-up areas outside the gazetted boundaries of the larger towns exactly offsets this. Adjustment for this factor in both census years for towns with a 1970 population of 50,000 and above leads to a 3.3% average annual urban growth. This implies that the extent of urban fringe dwellers has greatly increased (from 1.7% of the population of such towns within town boundaries in 1957 to 10.1% in 1970; Narayanan, 1976, tables II,5 and II,6, pp. 39, 41).

This once again leads to the question to what extent rural-urban migration has contributed to urban growth. This has obviously been quite variable for the major urban centres as witnessed by the substantial differences in growth rates between individual towns (table 2.6).

The very high growth rate for Petaling Jaya (13.3%) should be viewed in conjunction with the Kuala Lumpur rate of 2.8%, Petaling Jaya being a suburban town adjacent to Kuala Lumpur which has

TABLE 2.6. Growth of major towns[a] (ranked by 1970 size), Peninsular Malaysia (1957–1970).

Name of town	1970 population in gazetted areas (.000)	Proportion of gazetted area population to conurbation area population, 1970[b]	Average annual growth (gazetted area only) (%)
Kuala Lumpur	451.8	0.639	2.8
Georgetown	269.2	0.813	1.0
Ipoh	248.0	0.963	2.4
Johore Baharu	136.2	0.938	4.6
Kelang	113.6	1.000	3.1
Petaling Jaya	93.4	[c]	13.3
Malacca	87.2	0.866	1.7
Seremban	80.9	0.887	3.4
Alor Setar	66.3	0.772	1.7
Kota Bahru	33.1	0.789	2.8
Kuala Trengganu	53.3	0.897	4.6
Kuantan	43.3	1.000	4.9

Source: Soon Lee Ying (1976, tables IV,21 and IV,22, pp. 101–102), based on census data.

[a] State capitals plus metropolitan towns (75,000 and above) of Kuala Lumpur and Petaling Jaya.

[b] An urban conurbation area is defined as the totality of the gazetted area of the town being discussed and the built-up area lying outside its boundary.

[c] Included in Kuala Lumpur conurbation.

absorbed much of its overspill population (the total Kuala Lumpur conurbation having grown by an average annual rate of 4.1%; from 419,400 in 1957 to 706,900 in 1970). Apart from the Kuala Lumpur-Kelang conurbation, which in 1970 had clearly attained a primacy position[8] (and which is expected to dominate even more in future in view of the projected Kelang Valley development), Johore Bahru and the east-coast towns of Kuantan, Kuala Trengganu and, to a lesser extent Kota Bahru have been fast growing centres during

8. In 1947 Georgetown was still the largest town of Peninsular Malaysia. By 1957 Kuala Lumpur had surpassed Georgetown in size, but only in 1970 had a primacy position become apparent that is somewhat comparable to the position of such cities in neighbouring countries.

1957–1970. Historically important centres such as Georgetown, Ipoh and Malacca have witnessed a much slower growth (compare also Pryor, 1973). To some extent this is compensated by the growth of new settlements in the vicinity of these centres such as Butterworth and Tanjong Tokong in the case of Georgetown and Bukit Bahru in the case of Malacca (see Narayanan, 1976, appendix II, 1).

It has also been noted that during 1957–1970 population in smaller towns (especially those in the 10–20,000 population brackets) and in rural settlements of 1,000 to 10,000 inhabitants has grown much slower than population in larger towns and the remaining rural areas (Narayanan, 1976, tables II,5 and II,6, pp. 39, 41; and Saw Swee Hock, 1972, table 5).

The pattern of urban growth as described above is consistent with recent studies of internal migration (both life-time and intercensal 1957–1970) in Peninsular Malaysia (Pryor, 1972 and 1973, Soon Lee Ying 1976, Narayanan 1976, Government of Malaysia, 1976, pp. 149, 208) concluding that:

A. net interstate migration has been directed at Selangor and Pahang at the expense of almost all other states, notably of Perak;
B. rural-urban migration has not been very prominent, except in the case of Kuala Lumpur conurbation, Kuantan and Johore Bahru, but it appears that urban-urban migration has been quite important: notably a movement from smaller to larger towns has been apparent with a strong pull to Kuala Lumpur conurbation;
C. immigration into Pahang is strongly related to the rural development schemes initiated in that state.

It has been estimated that the urban population comprised 32.0% of total population in Peninsular Malaysia in 1975 and this is expected to increase to 35.1% in 1980 at an annual growth rate of 4.6%.[9]

9. Of which one half is expected to be the result of rural-urban migration. See Government of Malaysia (1976, pp. 149–150).

Interstate migrational patterns during 1970–1990 are expected to follow a similar pattern as in 1957–1970, except that a much larger net population outflow is expected from Kelantan and substantial in-migration to Penang (Government of Malaysia, 1976, p. 208). The prime area of urban growth will remain the Kelang Valley area[10] expected to grow at 4.3% annually during 1970–1990. The other major growth centres will be Kuantan on the east coast (expected to grow to 200,000 population in 1990; Government of Malaysia, 1976, p. 213), and Johore Bahru in the south, while it will also be attempted to further extend the network of secondary and tertiary urban centres, spreading urbanisation to the less developed regions in the peninsula (Ibid. pp. 212–214). Such patterns of urbanization and migration obviously have a substantial impact on housing problems and requirements, especially on differences in that respect between urban and rural areas. The main conurbation areas are likely to cause most reason for concern: problems are likely to be most acute and requirements will be largest in such areas.

2.4. THE MALAYSIAN ECONOMY

2.4.1. Main economic indicators, an international comparison

In terms of GNP per capita Malaysia is one of the wealthiest countries in Asia[11] (table 2.7), surpassed only by Japan, Singapore, Brunei (not listed in table 2.7, 1973 GNP per capita; US$1,640), Hong Kong and Taiwan. Along the world-wide GNP per capita continuum Malaysia is ranking approximately mid-way[12] comparable with countries such as Turkey, Algeria, Cuba, Peru and the Dominican Republic.

Malaysia's real per capita GNP growth has been quite substantial

10. See Aiken and Leigh (1975) for a description of the emergence and expected future development of this 'superlinear city', comprising Kuala Lumpur, Petaling Jaya, Kelang, Port Kelang and the new Selangor state capital of Shah Alam.
11. Excluding Middle-East countries.
12. Of the 188 countries covered in the 1975 World Bank Atlas, Malaysia ranked 89th position in terms of 1973 GNP per capita.

TABLE 2.7. Main economic indicators, South and East Asian countries (1973 population of 1 million and above only).

Country	1973 GNP per capita (at 1972–74 market prices converted to US$ at 1972–74 official exchange rates)	Growth rate of real GNP per capita 1965–1973 (%)	Income inequality: survey or census year (most recent available)	Income inequality: Income share of households: poorest 40%	Income inequality: Income share of households: richest 5%
Japan	3,630	9.6	1971	22.3	14.2
Singapore	1,830	9.4	1970	9.5[a]	n.a.
Hong Kong	1,430	5.8	1970	15.6	23.3
Taiwan	660	7.3	1972	22.3	13.3
Malaysia	570	3.7	1970	11.2	28.3
South Korea	400	8.7	1971	18.7	18.1
North Korea[b]	340	2.7	n.a.	n.a.	n.a.
Philippines	280	2.6	1971	11.9	24.8
China[b]	270	4.6	n.a.	n.a.	n.a.
Thailand	270	4.5	1970	14.7	21.3
South Vietnam	160	−0.7	1964	19.8[c]	15.8[c]
Indonesia	130	4.5	1971	17.3[d]	33.7[d]
India	120	1.5	1967–68	13.1	25.0
Pakistan	120	2.5	1970–71	20.6	17.3
Sri Lanka	120	2.0	1973	17.3	18.6
North Vietnam[b]	110	−0.5	n.a.	n.a.	n.a.
Nepal	90	−0.1	n.a.	n.a.	n.a.
Burma	80	0.7	1958	16.5[e]	14.6[e]
Bangladesh	80	−1.6	1966–67	19.6	16.7
Cambodia[b]	70	−5.2	n.a.	n.a.	n.a.
Laos[b]	60	2.5	n.a.	n.a.	n.a.

Sources: 1975 World Bank Atlas; S. Jain (1975).
[a] From: World Bank (1975), Housing Sector Policy paper, Appendix 2.
[b] Rough estimates.
[c] Rural households only.
[d] Income recipients.
[e] Urban Rangoon only.

during 1965–1973, its rate being higher than that of most countries in the region. During 1974 real per capita GNP growth slowed down after its peak year in 1973 and registered a marginal decline of 0.6% in 1975 as a consequence of the protracted recession in the major industrial countries. From mid-1975 signs of improvement began to emerge and real per capita GNP growth is expected to have reached 5.0% in 1976 (Bank Negara Malaysia, 1976, table 4, p. 53).

While Malaysia's growth performance has been quite impressive, the distribution of its aggregate income appears to be one of the most inequitable in the region. The income share of the poorest 40% is very low (only Singapore had a lower share), while the income share of the richest 5% is only higher in Indonesia. In 1970 the Gini coefficient for the Malaysian income distribution was 0.5179, the standardized Kuznets index 0.3947 and the standardized E index for entropy 0.4030, all indicating substantial inequality.[13] What is more, it appears that since 1957, when the first data on income distribution became available, there has been a trend of increasing inequality.[14] More recent data collected in the Household Expenditure Survey, 1973, have not yet been published, but preliminary impressions seem to indicate that inequality has declined somewhat during 1970–1973.

A note of caution should be added to the above comparisons, particularly those related to the distributional data. Differences in definitions and coverage make comparisons quite hazardous, yet it is probably quite safe to say that income inequality in Malaysia is relatively high and that this position has not improved appreciably during 1957–1970.

The fact that Malaysia is a comparatively rich developing country experiencing fairly steady growth but having a relatively high degree of income inequality has implications for housing, especially low-income housing. It would seem to indicate that, compared to poorer countries, Malaysia can more easily afford to spend re-

13. S. Jain (1975, p. 72). Data apply to Peninsular Malaysia only.
14. See D. R. Snodgrass, *Trends and Patterns in Malaysian Income Distribution, 1957–1970*, in D. Lim ed. (1975, pp. 251–268) for a thorough analysis of the five household surveys on which this conclusion is based.

sources on housing or to provide housing at relatively high standards. On the other hand the need for low-income housing may be comparatively more acute than in countries at a similar level of GNP per capita having a more equal income distribution. Some information on this is provided in the next chapters, particularly sections 3.2, 3.4 and 4.1.

2.4.2. Structure of the Malaysian economy

As mentioned above, Malaysia is a relatively small country in terms of population. In table 2.8 some structural features of its economy are compared to the 'expected' structure of a country having comparable population size and level of GNP per capita. This 'expected' structural pattern results from an international comparison of 1950–1970 data for 101 developed and developing countries (see Chenery and Syrquin, 1975). By comparing levels of the Malaysian variables to their 'expected' level (table 2.8), the specific features of the Malaysian economy will emerge most clearly.[15]

The most striking characteristic that is apparent immediately is the openness of the Malaysian economy: exports and imports are much higher in terms of GDP than their 'expected' level. This feature, combined with reliance on a small number of primary export commodities renders Malaysia vulnerable to price fluctuations on the world market for these commodities (see below). On the other hand the openness of the economy (also reflected in comparatively low levels of protection)[16] has brought exposure to international competition. A further aspect of the openness of the economy is the heavy dominance of foreign enterprise including imports of foreign technology and capital goods. In 1973 the proportion of foreign holdings of share capital in the corporate sector was still 58.1%, in spite of government efforts to 'restructure' ownership of share capital. This dominance is strongest (but de-

15. A similar approach has been used by Kasper (1974, pp. 7–17).
16. Import duties averaged 13% of imports (c.i.f.) during 1966–1973 and export duties 5% of exports (f.o.b.) in the same period. The Malaysian Ringgit is a fully convertible currency and quantitative restrictions are virtually absent in foreign trade. See also: J. H. Power, *The structure of protection in West Malaysia*, in: B. Balassa ed. (1971).

TABLE 2.8. Some structural characteristics of the Malaysian economy.

Characteristic[a] (in % of GDP at current market prices unless otherwise specified)	Expected value[b] at GNP capita of		Malaysia[c]
	US$500	US$800	1975
Macroeconomic characteristics			
—Gross domestic savings	21.0	22.6	24.7
—Gross domestic investment	22.0	23.4	23.2
—Net capital inflow	0.9	0.6	− 1.5
—Private consumption	64.5	62.5	54.0
—Government consumption	13.8	14.4	21.3
—Government revenue	23.4	26.8	25.2
—Tax revenue	20.3	23.6	22.9
—Exports	24.4	25.5	44.5
—Imports	25.4	26.3	42.6
Structure of production, labour force and exports.			
—Primary output (in % of GDP at factor costs	20.2	15.6	33.8
—Industry output (in % of GDP at factor costs)	29.4	33.1	19.0
—Utilities (in % of GDP at factor costs)	8.9	9.8	9.8
—Services (in % of GDP at factor costs)	41.5	41.6	36.8
—Primary labour (in % of total labour force)	39.5	30.0	47.7[d]
—Industry labour (in % of total labour force)	25.8	30.3	13.8[d]
—Service (incl. utilities) labour (in % of total labour force)	34.7	39.6	38.5[d]
—Primary exports	12.0	10.5	30.3
—industry exports	6.5	8.6	10.5
—Services exports	5.3	5.6	3.8
Miscellaneous			
—Government expenditure on education	3.7	4.1	6.0
—Primary and secondary school enrolment ratio	73.5	81.0	57.5

TABLE 2.8. (continued)

Characteristic[a] (in % of GDP at current market prices unless otherwise specified)	Expected value[b] at GNP capita of		Malaysia[c]
	US$500	US$800	1975
—Urban population in % of total population	52.7	60.1	29.7[e]
—birth rate per 1000 population	29.1	24.9	33.3[f]
—death rate per 1000 population	9.7	9.1	6.9[f]

[a]For exact definitions of these characteristics, see Chenery and Syrquin (1975, pp. 180–187).
[b]Population 10 million. Source: Chenery and Syrquin (1975, table 3, p. 20).
[c]Sources: Government of Malaysia (1976); Bank Negara Malaysia, *Quarterly Economic Bulletins*; The Treasury, Malaysia (1974).
[d]Peninsular Malaysia only.
[e]Estimated percentage of the population living in gazetted areas of 10,000 population and above. Due to country-to-country differences this figure is not very comparable to the Chenery and Syrquin data.
[f]Peninsular Malaysia (1972).

clining) in the modern agricultural (plantations) and mining sectors and, to a lesser extent, in manufacturing, wholesale trade and banking (Government of Malaysia, 1973, table 4-7, p. 83, and 1976, tables 9-8 and 9-9, pp. 183–184).

A second prominent feature of the Malaysian economy is the relatively low level of private consumption, offset by a high level of government consumption. Gross domestic investment is close to its expected level; domestic savings somewhat higher. The relatively high level of government consumption is reflected in high expenditures on education and relatively high standards of health as well as a well-developed physical and administrative infrastructure.

The structure of production, labour force and exports is characterised by a strong orientation towards primary products (although manufactured exports constitute a higher share of GDP than expected as a consequence of the high overall export share), particularly to major foreign exchange earners such as rubber (27.8% of total gross commodity exports during 1971–1975), tin (14.9%), logs and sawn timber (15.6%), palm oil (9.8%) and petroleum (6.6%) (Government of Malaysia, 1976, table 2-4, pp. 20–21). The export

TABLE 2.9. Prices of major exports, Malaysia (1970 = 100).

Commodity	1971	1972	1973	1974	1975
Rubber	82.0	74.2	119.4	143.6	108.4
Tin	95.0	94.3	100.6	161.6	141.5
Saw logs	101.4	90.0	135.0	149.7	109.4
Sawn timber	100.0	108.8	175.2	172.7	159.0
Palm oil	100.9	79.1	88.9	183.2	172.3
Petroleum	116.9	124.5	166.5	508.6	538.2

Source: Bank Negara Malaysia (1976, table VII,3, pp. 77–78).

value of these commodities, together constituting three quarters of gross commodity exports, has fluctuated greatly during the last few years, mainly as a consequence of strong fluctuations in world market prices for these commodites (table 2.9). Particularly the contrast between 1972 and 1974 prices is marked.

The share of manufactures, however, has steadily grown during 1971–1975 from 8.5% of gross commodity exports in 1971 to 21.0% in 1975. (Government of Malaysia, 1976, table 2-4, pp. 20–21).

The internal price level maintained a high degree of stability until 1972, after which year inflation accelerated in Malaysia (table 2.10), but this slowed down again in 1975.

Prices of foodstuffs (having a weight of 46.8% in the consumer price index) showed a similar trend.

Historically, Malaysia has been a labour-shortage, labour-

TABLE 2.10. Consumer prices, Peninsular Malaysia (1967 = 100).

Year	Total	% change	Food	% change
1968	99.8	− 0.2	98.8	− 1.2
1969	99.4	− 0.4	96.9	− 1.9
1970	101.3	+ 1.9	99.1	+ 2.3
1971	102.9	+ 1.6	100.8	+ 1.7
1972	106.2	+ 3.2	103.8	+ 3.0
1973	117.4	+10.5	120.3	+15.9
1974	137.8	+17.4	151.8	+26.2
1975	144.0	+ 4.5	157.3	+ 3.6

Source: Bank Negara Malaysia (1976, table VI,8, p. 72).

immigration economy. This changed in the 1960's when unemployment and underemployment became serious problems due to a rapid natural increase of the labour force, outpacing employment growth. During 1971–1975 the labour force increased by 3.2% annually, while employment grew at the rate of 3.3%, causing unemployment to fall from 7.4% of the labour force in 1971 to 7.0% in 1975. For Peninsular Malaysia these figures were 8.0% and 7.6% respectively. (Government of Malaysia, 1976, tables 8-1 and 8-2, pp. 140–142). Unemployment is highest in urban areas (table 2.11), while underemployment appears more prevalent in rural areas.[17]

2.4.3. Income and wealth imbalances[18]

It has been shown above (table 2.7) that income inequalities are substantial in Peninsular Malaysia. Apart from interpersonal income

TABLE 2.11. Unemployment and underemployment by % of the labour force, Peninsular Malaysia, (1972).

Employment status	Urban areas	Rural areas	All areas
Actively[a] unemployed	9.5	5.4	6.8
Passively[b] unemployed	1.0	1.3	1.2
Employed full time or for more than 48 hours per week	56.2	39.1	44.9
Employed 35–48 hours per week	19.7	21.8	21.1
Employed 25–34 hours per week	6.6	14.0	11.5
Employed, but for less than 25 hours per week	7.0	18.4	14.5

Source: Department of Statistics, Malaysia, *Labour Force Survey Data*, (October, 1972).
[a]Actively looking for a job.
[b]Not actively looking for a job, but will accept a job if given.

17. Recent information on structure of labour force, employment, unemployment and underemployment is scanty and not as reliable. The most comprehensive source of labour market data available, the *Socio-economic Sample Survey of Households* refers to 1967–68. Detailed labour market data from this survey are presented in the discussion on the accounting price of labour (section 5.3.3).
18. This section mainly relates to Peninsular Malaysia. Although there are indications of relatively high levels of poverty and substantial income inequalities in Sabah and Sarawak, no comprehensive data are available to date.

differences as such, three interrelated aspects of the distribution of income and wealth are of particular importance in the Malaysian context. These consist of ethnic disparities in income and wealth, rural-urban income differences and regional income imbalances.

Ethnic and rural-urban disparities tend to be correlated strongly in Peninsular Malaysia: Malays comprised 63.5% of the rural population in 1970, but only 27.6% of the urban population (table 2.4). In contrast, Chinese formed 58.4% of the urban population, but only 26.2% of the rural population. Mean urban household income was more than twice as high as the mean rural household income (table 2.12) in 1970: A similar disparity existed between Chinese and Malay household incomes, with the mean Indian household income in between. Intra-ethnic inequality was roughly similar for Malays and Chinese, while income inequalities among Indians appeared to be somewhat higher, notably in the urban areas. For all three ethnic groups income inequality was higher in urban than in rural areas.

Another aspect of ethnic disparities is found in the distribution of wealth and ownership of assets (table 2.13). Apart from heavy

TABLE 2.12. Ethnic income disparities in urban and rural areas, Peninsular Malaysia (monthly household incomes in M$, 1970)[19].

Ethnic group		Urban areas	Rural areas	All areas
Malays and other indigenous	Mean	328	155	179
	Median	227	122	122
Chinese	Mean	464	333	387
	Median	290	254	271
Indian	Mean	442	237	310
	Median	242	220	196
All households (including 'others')	Mean	428	200	269
	Median	270	141	169

Source: Government of Malaysia (1973, table 1-2, p. 4). Income includes cash income, imputed income in kind, plus transfer receipts.

19. In 1970 the official exchange rate of the Malaysian Ringgit (M$) vis-à-vis the US dollar stood at US$1.00 = M$3.08. In April, 1976 this was US$1 = M$2.55.

TABLE 2.13. Ownership of assets and participation rates, Peninsular Malaysia 1972/73 (% shares).

Category	Malay[a]	Chinese	Indian	Other Malaysian[b]	Foreign
Planted acreage in modern agriculture (1973)[c]					
—rubber and oil palm	21.0	26.3	2.6	7.9	42.2
—coconut and tea	0	19.9	10.8	0.4	68.9
Value of fixed assets in industry (1972)					
—mining	0.7	35.2	0.1	9.5	54.5
—manufacturing	6.9	32.5	0.8	14.0	45.8
—construction	2.4	85.6	1.4	3.8	6.8
Turnover value in trade (1972)					
—wholesale	0.8	55.0	2.7	0.6	40.9
—retail	3.6	75.6	6.5	0.2	14.1
Value of fixed assets in transport (1972)					
—taxi	40.6	39.7	18.0	1.7	0
—bus	18.0	54.3	1.6	16.5	9.6
—haulage	15.3	70.6	5.2	5.8	3.1
Annual revenue, professional establishments (1973)[d]	5.3	51.0	11.4	18.4	13.9
Ownership of share capital in limited companies (1972)[e]	4.2	28.6	1.1	6.0	60.0

Source: Government of Malaysia (1976, tables 9-8 and 9-9, pp. 183, 184).
[a]Malay and Malay interests (i.e. Government holdings held in trust for the Malays).
[b]Other Malaysians and establishments where no particular group owns more than 50% of assets.
[c]Includes holdings by the Federal Land Development Authority (FELDA) of which 96.2% was classified as Malay-owned.
[d]Doctors, dentists, lawyers, accountants, architects, engineers, surveyors and veterinary surgeons.
[e]The corporate sector accounts for approximately 30% of GDP.

foreign dominance throughout the economy (though more limited in sectors like construction, retail trade, transport and professional establishments), a strong underrepresentation of Malays is visible in all sectors. To a lesser extent this applies to Indians as well (except in the case of ownership of taxi companies and professional establishments). Chinese interests dominate especially in the trade, construction and transport sectors.

Regional income disparities, too are associated with ethnic and rural-urban differences (table 2.14). While the association does not hold consistently throughout (the state of Sabah being an odd case), at least for the Peninsular states the pattern is clear: poor states are associated with a low degree of urbanisation and a high proportion of Malay (and other indigenous) population. Extreme examples are Kedah/Perlis, Kelantan and to a lesser extent Trengganu. At the other end of the scale, the richest state, Selangor is also highly urbanized and had a low percentage Malay population in 1970.

The above disparities are a strong potential source of ethnic conflict in the Malaysian political setting. Awareness of this has strongly influenced political thinking on development planning in Malaysia, as is shown in the next section.

TABLE 2.14. Regional disparities, Malaysia (1970).

State	Per capita GDP ratio (Malaysia = 1.00)	Percentage of households in poverty[a]	Percentage of urban population	Percentage of Malay and other indigenous population[c]
Johore	0.91	45.7	26.3	53.4
Kedah/Perlis	0.67	64.5	11.2	71.6
Kelantan	0.47	76.1	15.2	92.8
Malacca	0.80	44.9	25.0	51.8
Negri Sembilan	0.99	44.8	21.4	45.4
Pahang	0.98	43.2	19.0	61.2
Penang	0.99	43.7	51.0	30.7
Perak	0.99	48.6	27.6	43.1
Sabah	1.19	n.a.	16.5	73.2
Sarawak	0.89	n.a.	15.4	69.0
Selangor	1.63	29.2	45.0	34.6
Trengganu	0.60	68.9	27.0	93.9
Malaysia	1.00	49.3[b]	26.7	55.9

Source: Government of Malaysia (1976, tables 10-1 and 10-2, pp. 201, 202), Department of Statistics, Malaysia (1972a).

[a]Percentage of households below the poverty line income. The Malaysian government has adopted a per capita household poverty line income concept in the Third Malaysia Plan document. This income, taking account of minimum nutritional and other non-food requirements, was estimated at M$33 per month in 1970.

[b]Peninsular Malaysia only.

[c]See tables 2.1 and 2.2.

2.5. THE POLITICAL BACKGROUND TO DEVELOPMENT PLANNING[20]

When the Alliance Party was formed (see section 2.2) the leaders of the component parties struck a political bargain in which the interests of all three major ethnic groups were represented. When Malaya achieved independence in 1957 under the Alliance government, this compromise of interests was incorporated in the constitution of the new nation, in subsequent legislation as well as in tacit agreements between the component parties.

The Malays were guaranteed political dominance. By the delineation of constituency boundaries, heavily favouring the rural areas (sometimes to the extent of 1 to 2 in terms of constituency population), Malays would be assured of comfortable majorities in the Federal Parliament. A similar pattern was to prevail in the individual states, even in those states where the majority of the population was non-Malay. Thus the Mentri Besars (Chief Ministers) of the states and the members of the Federal Cabinet were predominantly Malay. The constitutional Head of State, the Yang di-Pertuan Agong, would be a Malay sultan, chosen by the traditional rulers among themselves for a five-year term of office. The official religion was to be Islam and the national language Malay. Various Malay privileges were incorporated in the Federal Constitution. These privileges included quotas and preference in government employment, reservation of certain lands for exclusive ownership by Malays, special scholarship and training privileges.[21]

In return, the non-Malays received full and equal citizenship if born in Malaya and more liberal naturalization rights than existed during the colonial era. This also meant political participation and

20. For post-war political development in Malaya until 1965, see e.g. M. Noordin Sopiee (1974); for the 1969 elections and their aftermath see Goh Cheng Teik (1971), the 1974 elections, Pillay (1974). For the political development of Sabah and Sarawak, see Milne and Ratnam (1974). Recent political developments are discussed in: Yong Mun Cheorg, ed. (1974), far Eastern Economic Review, 1975, 1976 and 1977 Asia Year Books, its August 27, 1976 (Vol. 93, no. 35) and September 2, 1977 (Vol. 97, no. 35) issues.

21. Some of those privileges, such as that of land reservation, already existed during the colonial era.

rights to political office. Religious freedom and liberal use of communal languages were also part of the bargain, as well as an understanding that existing economic stakes of non-Malays would not be threatened by the government.

Any inter-ethnic conflict was to be settled by accommodation of the ethnic communities' leaders at the top of the political hierarchy. Thus at the time of Malayan independence the political structure reflected the social realities on the peninsula: three major ethnic communities lived side by side, compartmentalized and each having their own political representation in the government. Until 1969 this arrangement managed to contain inter-ethnic tensions reasonably well[22] and until the general elections in that year the Alliance government ruled virtually unchallenged, not only at the Federal level, but also in most of the states.

In the 10 May, 1969 elections[23] the Alliance suffered a major setback; all three component parties lost, but particularly the MCA, which apparently had lost the confidence of Chinese voters: its number of Parliamentary seats was slashed to less than half from 27 to 13. UMNO was able to withstand the opposition onslaught somewhat better, its number of seats being reduced from 59 to 51. MIC lost one of its 3 seats. The lost seats predominantly went to the more extremist opposition parties: the conservative Malay-muslim party PAS (Pan-Malayan Islamic Party), clamouring for Malay privileges and purity of life-style according to the teachings of the Koran, increased its strength from 9 to 12 seats; the new DAP (Democratic Action Party), championing the rights of the immigrant ethnic groups, gained 13 seats, and the Gerakan Rak'yat Malaysia (Malaysian People's Movement), a middle-of-the-road opposition party largely dominated by non-Malay intellectuals, won 8.

Yet the Alliance party still held 66 out of the 104 peninsular seats in the Federal Parliament. Of the 40 seats allocated to Sabah and Sarawak (where elections were to be held later the same month),

22. One notable exception being the racial riots in Penang in November 1967 following political exploitation of a strike by merchants and street-vendors.
23. See Goh Cheng Teik (1971) for an account and analysis of the election results and the ensuing events till the end of National Operations Council rule in February 1971.

33 were in the hands of political allies of the Alliance, thus still giving the government a clear majority of 99 out of 144.

At the state level the defeat of the Alliance was much more serious. In Kelantan the PAS opposition retained the majority and therefore the state government, in Penang the state government was captured by the Gerakan, in Perak the combined opposition won the majority in the state assembly (but was unable to form the state government because of internal disagreements), while in Selangor a deadlock arose, the Alliance gaining exactly half of the 28 state assembly seats.

The announcement of the Selangor results was followed by DAP-Gerakan victory celebrations and counter-processions on the part of UMNO supporters in Kuala Lumpur. In the prevailing tense atmosphere of uncertainty, these demonstrations sparked off racial riots on 13 May, 1969. These riots and their aftermath left approximately 200 people dead and more than 400 wounded according to official estimates.[24]

The government suspended parliament and postponed the elections in Sabah and Sarawak. Executive power was transferred to a nine-man National Operations Council (NOC), chaired by the Deputy Prime Minister and further consisting of four senior Alliance politicians, two senior civil servants, the Chief-of-Staff of the armed forces and the Inspector-General of police.

Elections in the East Malaysian states took place in June–July 1970 and bolstered the government with sufficient support to attain an overall two-thirds majority in the Federal Parliament.[25] State government problems in Perak and Selangor were solved through back-door negotiations. At the Federal level the Prime Minister, Tengku Abdul Rahman was replaced by his deputy, Tun Abdul Razak, the NOC chairman. In February 1971 the state of national emergency officially ended and government by parliament and cabinet was restored.

24. See National Operations Council (1969, pp. 88–90). Unofficial estimates were much higher: figures of 2,000 killed have been quoted.

25. In Sabah all 16 parliamentary seats went to parties associated with the Alliance, while in Sarawak 9 out of 24 seats went to the SNAP (Sarawak National Party) opposition.

During the period of NOC rule an intensive review of national policies and priorities had taken place. It was realized that communal compartmentalization and accommodation at the top could not safeguard the country from racial strife. It was also felt that as long as the Malays were not in a position to participate on an equal footing with other ethnic groups in the modern sectors of the economy their present privileged political position had to be maintained. But on the other hand this could lead to a situation in which a purely Malay Government would face a solidly non-Malay opposition, which would be potentially very explosive.

To solve this dilemma a new development strategy was devised, the New Economic Policy (NEP, see section 2.6.2. below). In view of its radical departure from past development trends, the Razak government felt it was necessary that this strategy would be supported by a broad political base. Consequently, after the NOC period it has consistently sought to widen this base by bringing opposition parties into the government, both at Federal and state levels.[26] In February 1972, a coalition state government was formed in Penang between the Gerakan and the Alliance, while a similar move followed in May 1972 in Perak between the opposition PPP (Peoples' Progressive Party) and the Alliance. Finally, in January 1973 an agreement was reached between the Alliance and PAS resulting, among other things in the appointment of PAS ministers in the Federal Cabinet and UMNO participation in the PAS-dominated state government of Kelantan. Effectively this meant that almost all (potential and actual) opposition groups were now aligned with the government. In 1974 this was formalized by the establishment of the Barisan Nasional (National Front), which shattered the remaining opposition parties in the August 1974 parliamentary and state elections. The Barisan captured 135 out of the 154 seats in the enlarged Federal Parliament and retained

26. In fact, the first step in that direction had already been taken before the official end of NOC rule, when in Sarawak after the 1970 elections a coalition state government was formed between the Sarawak United Peoples' Party (SUPP) and the Sarawak Alliance. SUPP's president was brought into the Federal Cabinet.

control of all state governments. Only in Sarawak (SNAP) and Perak (DAP) was the opposition not wiped out completely.[27]

The formation of the BN and its subsequent massive victory meant increased support for the NEP in two ways:

—all quantitatively important parties of all ethnic groups (with the exception of the DAP and SNAP) now supported the NEP and this was endorsed by the electorate; and
—dissident state governments were contained within the BN. This allowed a better harmonization of development policies in the states than before the formation of the Barisan, when the opposition dominated state governments in Penang and Kelantan had not accepted the NEP in toto and had also not received their due share of Federal Development Expenditure.

The trend towards increasing Federal control over state governments was further extended when the relatively independent Chief Minister of Sabah was forced to resign in early 1976. His party was subsequently beaten in the April 1976 state assembly elections by a new party backed by the Federal Government. Also, the Selangor Menteri Besar, whose independent power base and extremist Malay rights position (he was thought in some quarters to have induced or at least failed to have restrained the 1969 riots) had been a source of worry to the Federal Government, was removed from office in March 1976, leading to increased Federal control over the Selangor state government.

2.6. DEVELOPMENT PLANNING IN MALAYSIA

2.6.1. Early development planning

The first attempt at planning in Peninsular Malaysia was the Draft Development Plan for 1950–1955, but the first comprehensive

27. Of the other opposition parties only the Partai Keadilan Masyarakat (Pekemas – Social Justice Party) gained one parliamentary and one state seat. The Partai Sosialis Rak'yat Malaysia (Socialist People's Party) as well as two other minor opposition parties did not win a single seat.

planning effort resulted in the First Development Plan for Malaya for period 1956–1960, published in 1956. This plan, formulated prior to independence, was essentially growth-oriented and particularly stressed the development of government revenue-earning sectors (perhaps not surprising in a colonial era), especially rubber.

The Second Five-Year Plan (1961–1965) differed substantially from its predecessor in scope and objectives. It clearly reflected the intention to bring about rural advancement, raise aggregate productivity levels and diversify the economy. Consequently a shift in allocation took place benefiting the rural sector and particularly emphasizing land development.

The First Malaysia Plan (1966–1970) was much more ambitious, with yet greater emphasis placed on agriculture and land development, while otherwise its objectives were similar to those of the Second Malaya plan.

What the first three five-year plans had in common was an emphasis on income growth, while explicit distributional objectives did not come into play. To be sure, in all these plans a shopping list of various objectives were incorporated, but these figured largely as rather imprecise statements of desirable events which could mean all things to all men.[28] The plans were based on a conventional aggregate macroeconomic planning model. Comprehensive inter-industry programming models were not used, in view of insufficiency of data[29] and expertise and because the economy of Peninsular Malaysia has a relatively simple structure.

2.6.2. The New Economic Policy (NEP)

As mentioned in section 2.5. the 13 May, 1969 riots brought an increased awareness of the acute problems of a plural society in which substantial income and wealth differences exist along racial lines and where race is strongly identified with social and economic func-

28. See Syed Hussein Wafa (1974a) for an overview of the objectives of the successive plans.
29. Inter-industry accounts have been published for 1960, 1965 and (recently) for 1970. The earlier tables especially suffered from qualitative inadequacy, such as the limited number of sectors distinguished (29 and 30 respectively) and 'guesstimates' for a number of sectoral inputs.

tion. This led to the formulation of the NEP[30] designed to facilitate the achievement of national unity. The NEP has two major objectives:

—to eradicate poverty among all Malaysians irrespective of race; and
—to restructure Malaysian society so as to reduce and eventually eliminate the identification of race with economic function.

An important constraint on the achievement of these objectives is that there will be no outright redistribution programme of existing stakes in the economy from the rich to the poor, from one ethnic group to another or from foreigners to Malaysians. In other words the structural changes necessary to achieve the objectives will have to come about predominantly by ensuring that growth in ownership of assets and employment will be higher for the target population groups to be favoured than for the remainder of the population.[31] With this line of thinking it is clear that high overall economic growth is an essential precondition to the success of the NEP: the higher the overall growth rate, the more latitude for growth rate differentials without any group feeling deprived.[32]

The objectives of the NEP are to be achieved within the Perspective Plan period (1970–1990). More specific long-term development targets are:

—full employment by 1990;
—substantially increased productivity and income of those engaged in low-productivity occupations;
—a reduction in the existing interpersonal and inter-ethnic income disparities;

30. The doctrine of the NEP has been outlined in the following documents: Government of Malaysia (1971, chapters I and III, pp. 1–9, 36–48; 1973, chapters I and IV, pp. 1–21, 61–94; 1976, chapter I, pp. 1–10).
31. To be sure, income redistribution also takes place through the fiscal system notably through progressive income taxation and a government expenditure pattern geared towards favouring the Malays. See D. R. Snodgrass, *The Fiscal System as an Income Redistributor in West Malaysia*, in D. Lim ed. (1975, pp. 269–291).
32. See Thillainathan (1976, particularly chapters III and VII) for a detailed analysis of this.

—Malays and other indigenous people will own and operate at least 30% of the economically productive assets by 1990;
—sectoral and occupational employment patterns must reflect the racial composition of the country's population by 1990.

The NEP has no specific objectives in the field of housing, which, until the drafting of the TMP document, has been rather neglected as a policy area.

The New Economic Policy was the subject of considerable controversy during the first few years after its inauguration in 1970, mainly related to questions of its consistency and feasibility. However the basic assumption underlying the NEP, that reductions in ethnic imbalances in income, employment and wealth will contribute to a lessening of racial tensions and thus serve to promote national unity, is rarely called into question (see however Lin, 1973, pp. 295–296). Yet it is quite conceivable that decompartmentalization in the economic sphere, leading to increased inter-ethnic competition, may actually increase racial tensions (at least initially) rather than reduce them.

Criticisms regarding internal consistency and feasibility focus on the constraints related to the simultaneous achievement of a high economic growth target (real GDP at factor costs is targetted to grow at 8% per annum during 1971–1990); Government of Malaysia, 1976, p. 53) and the ethnic restructuring targets in the fields of ownership and employment within the Perspective Plan period.[33] Areas of particular concern are the insufficiency of Malay savings and expertise; and Chinese employment in agriculture, while the

33. See e.g. Syed Hussein Alatas (1972), Yahya bin Abdul Wahab (1973), Thillainathan (1970) and (1976, chapter VII) and the following articles in Chee and Khoo Siew Mun, eds. (1975):
—Syed Waseem Ahmad, *Savings strategy, New Economic Policy and the restructuring of society: perspective and implications*;
—R. Thillainathan, *Public enterprise as an instrument for restructuring society – the Malaysian case*;
—C. L. Robless, *The feasibility and internal consistency of the New Economic Policy.* This paper, by the Deputy Director-General of the Economic Planning Unit in the Prime Minister's department can be viewed as the government's response to criticisms of the NEP and its implementation during the Second Malaysia Plan period.

overall rate of domestic savings required, in the face of a declining share of foreign holdings in the total stock of assets over the period, is generally thought to be attainable.

2.6.3. The Second and Third Malaysia Plans[34]

The Second Malaysia Plan, 1971–1975, (SMP) formed the first phase of NEP implementation. In spite of the impact of world-wide recession on the Malaysian economy during 1974–1975 its growth targets have largely been met: GDP at factor costs in real terms grew by 7.4% per annum during the SMP period as compared with the original SMP target of 6.8% and the revised target in the 1973 Mid-Term Review (MTR) of 7.8%; employment creation of 588,000 jobs fell a little short of the MTR target of 600,000, yet unemployment fell from 7.4% of the labour force in 1970 to 7.0% in 1975 and there was also a reduction in underemployment.

The SMP success in poverty eradication is less easy to demonstrate. It has been estimated that, in 1970, 49.3% of all households in Peninsular Malaysia had incomes below the poverty line income (see table 2.14). In the Third Malaysia Plan (TMP) document the comparative figure for 1975 has been indicatively projected at 43.9%.[35]

Restructuring of employment in such a way that it will reflect the racial structure of the population by 1990 has made substantial progress during 1971–1975 in enlarging the Malay share in the secondary and tertiary sectors, albeit largely at the lower levels of the occupational hierarchy. The Malay share of secondary sector employment increased from 30.8% in 1970 to 36.5% in 1975 (target: 51.9% in 1990), whereas in the tertiary sector these figures were 37.9 and 42.3 (target: 48.4) respectively. Problems remain in the sales occupations in this respect, and in the area of Chinese employ-

34. The Third Malaysia Plan (1976–1980) brought the introduction of a more sophisticated planning framework into Malaysian development planning. The 1970–1990 Perspective Plan projections of growth and structural change for Peninsular Malaysia were derived from a comparative static input-output model for Peninsular Malaysia using the 1970 input-output table. Forecasts for Sabah and Sarawak were based on conventional macro-economic projection techniques.

35. Government of Malaysia (1976, tables 4–13 and 9–3, pp. 73 and 163 respectively). Comparable data for Sabah and Sarawak were not available.

ment in the primary sector which declined from 21.4% in 1970 to 20.7% in 1975 (see Government of Malaysia, 1976, pp. 32–33, 76–85, and 186–189). The unemployment rate, while showing an overall decline, indicates substantial differences between the major ethnic groups on the peninsula. For the Malays, unemployment declined from 8.1% of the Malay labour force in 1970 to 6.9% in 1975, while for the Chinese these figures were 7.0% and 7.2% respectively and for Indians 11.0 and 12.2% (Government of Malaysia, 1976, p. 188). Thus while it appears that restructuring targets for Malay employment have by and large been attained during the SMP period this is considerably less so for the other communities. Performance in restructuring the ownership of assets during the SMP period fell short of the target. As a proportion of all equity capital in the corporate sector the share held by Malays and Malay interests combined increased from 2.4% in 1970 to 7.8% in 1975, a shortfall compared with the target of 9%. Moreover, out of this 7.8%, 5.5% consisted of Malay interests i.e. shares held in trust for the Malays by various government agencies. This acutely illustrates the problem of Malay savings (Government of Malaysia, 1976, table 9–9, p. 184. See also Thillainathan, 1976, chapter VII).

During the SMP period there has been considerable criticism concerning interpretation of the NEP targets by government agencies and implementation of the policy. A recurrent theme has been that the aspect of restructuring of employment and ownership of assets in the modern sector has been overstressed at the expense of the target of alleviating poverty irrespective of race.[36] In addition the lop-sided interpretation of the policy to restructure employment and ownership of assets as to increase solely the Malay share in employment and ownership of assets in the modern sectors (with the necessary concomitant racial bias in education policy) has raised questions related to non-Malay participation in agriculture, particularly in government-sponsored land development schemes, as well as resentment against the Malay élite, who have presumably

36. In fact, some critics have raised the question whether this stress on restructuring has not aggravated existing intra-ethnic income inequalities. See e.g. Syed Hussein Alatas (1972, pp. 9–13), Thillainathan (1975).

benefited most from this policy (see e.g. Chan, 1975).

In addition, foreign investors have become wary of what they perceive as gradual Malaysianisation of their holdings (this is certainly well-founded in as far as the employment structure goes, but in case of equity ownership no forced take-over was intended – although individual government agencies may have been somewhat over-zealous in this respect). In addition to this. the cautious attitude of potential foreign investors has been reinforced by the events in Indo-China in early 1975; the subsequent intensified Malayan Communist Party (MCP) guerilla activities on the peninsula;[37] and potentially restrictive legislation such as the Industrial Co-ordination Act and the Petroleum Development (Amendment) Act, which were enacted in the same year.

The government has been sensitive to those criticisms and reservations as witnessed by the TMP document. While in the SMP and particularly the MTR documents the restructuring objective clearly was most prominent, in the TMP much attention is paid to the overall poverty problem, which for the first time finds quantitative expression in the establishment of a poverty-line per capita household income and the identification of target poverty groups, for whom special poverty reducing measures are devised. The expected extent of poverty reduction during the Perspective Plan period also has been expressed in a quantitative target for the first time: the percentage of households in poverty in Peninsular Malaysia is targeted to decline from 43.9% of all households in 1975 to 16.7% by 1990 (Government of Malaysia, 1976, table 4–13, p. 73). In terms of emphasis, the objective of restructuring has clearly declined in importance as compared to poverty reduction. Moreover, as part of the first objective, aspects of non-Malay participation in Malay-dominated activities, notably in agriculture, have achieved greater prominence.[38] Similar emphasis has been given to the argument that restructuring of ownership of assets is not incompatible with substantial foreign investment in the context of a growing

37. Communist guerilla activities in East Malaysia have subsided considerably since the defection to the government of 500 guerillas in Sarawak in late 1973.

38. Government of Malaysia (1976, p. 49). See also Far Eastern Economic Review, Vol. 93, no. 31, July 30, 1976, pp. 95–101.

economy[39] (real GDP at factor costs is targeted to grow at 8.5% annually during 1976–1980).

The increased importance of the security issue as a result of intensified guerilla activities is reflected in the attention it is given in the TMP document (it is mentioned by and large that the targets of the NEP must be attained, because otherwise subsequent discontent among the population may provide fertile ground for "subversive" elements; Government of Malaysia, 1976, pp. 9–10, 101–103). However, this has led only to a marginal increase of the defence and security share of government development spending, from 10.4% of total public development expenditure during the SMP period to 11.9% during the TMP.[40]

Other areas of increased attention in the TMP consist of regional development (particularly directed at the poorer east-coast states of Peninsular Malaysia, and at Sabah and Sarawak; ibid., chapter X, pp. 199–217) and housing (chapter XIX, pp. 330–341). The share of public housing (excluding institutional housing and staff quarters as well as state-financed housing schemes) of public development expenditure will rise from 2.4% during 1971–1975 to 3.8% in 1976–1980 (ibid., table 12-3, pp. 240–241). A detailed comparison of the TMP housing programme with housing performance during the SMP period is provided in the next chapter (section 3.2.2).

The TMP document is considered to be a more balanced document than its predecessor (this is even admitted by the generally highly critical DAP opposition) and will go a long way in allaying non-Malay and foreign anxieties. Its growth targets appear to be attainable without unduly straining the economy (see Far Eastern Economic Review, Vol. 93 No. 31, July 30, 1976, pp. 95–101), but its racial balance targets (especially in terms of equity ownership) may provide some problems.

39. In fact, throughout the TMP document it is stressed that private investment (both domestic and foreign) is welcome and needed for the success of the TMP. See particularly pp. 88–89 and pp. 277–282.

40. Ibid., table 12–3, pp. 240–241. Total public development expenditure is targeted to increase by 89% from M$9.82 billion (11.3% of GNP at market prices) during 1971–1975 to M$18.56 billion (11.9% of GNP at market prices) during 1976–1980. In real terms the increase will be approximately half this percentage.

3. Housing in Peninsular Malaysia

3.1. INTRODUCTION

The fulfilment of housing needs is a major social objective of national development. The aim is to ensure that all Malaysians, in particular the lower income groups, have access to adequate housing. The Third Malaysia Plan (TMP) emphasizes the provision of housing as an important component of the programmes to eradicate poverty (Government of Malaysia, 1976, p. 330).

Until recently discussions on housing problems in Malaysia have been dominated by the traditional way of looking at housing: how many units of at least a certain minimum standard should be built in order to solve the housing problem and how should they be supplied? At present a growing awareness that this is insufficient is discernible. Current debates on housing options include second-best issues, the physical environment of settlements, tenancy issues, and problems of occupant participation.[1] This change in attitude towards housing problems is not restricted to the Malaysian setting: in fact, in both industrialized and developing countries alike, people are taking a second look at housing.

In industrialized countries this is caused partly by the fact that housing problems have gradually shifted from being quantitative (in European countries particularly, which have overcome the Second World War backlog and are facing a slow-down of population growth) to qualitative in nature. Improvement of housing conditions has come to the fore. At the same time, especially in the USA, but also in European countries, a growing dissatisfaction with the bulldozer approach to urban renewal has been experienced. These factors have turned the attention from annual target numbers for new housing construction to the merits of the existing housing stock and to what extent rehabilitation of this stock may provide a

1. See e.g. the papers presented at the *Conference on Human Settlements for the Rakyat in the Lower Income Groups*, held in Kuala Lumpur, May 2–8, 1976, particularly those by Kamal Salih and Ahmad Rahim. See also: Government of Malaysia (1976, pp. 330–341).

more acceptable living environment than demolition followed by new construction.

In the cities of developing countries such large-scale demolitionary urban renewal is the exception rather than the rule. In this case increased attention to other than traditional housing solutions is caused mainly by the awareness that the sheer magnitude of housing needs as influenced by population growth and migration, combined with the constraint of low overall income levels, prevents a conventional solution from being the sole answer to the problem.

Yet, although the reasons for the change in thinking on housing issues may not have been identical in developed and developing countries, the results have been broadly similar: an increased consciousness of the availability of a wide spectrum of housing options ranging from second-best solutions[2] through traditional housing provision to the incorporation of environmental aspects. Depending on the particular circumstances different combinations of various options are best suited to fulfil the three basic housing functions of location, tenure and amenity (Turner and Fichter, eds., 1972, pp. 164–169; Smith, 1970, pp. 3–10; and also Mittelbach, 1974, pp. 42–43). The contents and relative importance of each of these functions varies with the number of conditions related to environmental circumstances and the socio-economic position of the tenant.

> ... for any place to function as a dwelling, it must have an accessible location, it must provide secure, continued residence for a minimum period and it must provide a minimum of shelter from hostile elements – whether climatic or social. (Turner, 1968, p. 356).

Section 3.2. discusses aggregate housing needs and supply. Attention is paid to overall housing conditions and housing needs in Peninsular Malaysia (§3.2.1), including both urban and rural hous-

2. A combination of housing services which falls short of the finished product. This broad heading includes a wide range of possible options such as provision of unserviced or serviced plots (in the second case various service levels are conceivable), provision or upgrading of infrastructure in existing areas, structural rehabilitation of housing units in existing areas, provision of a bare skeleton (a roof over one's head), and more near-complete varieties of core-housing. See Burns (1975, p. 2).

ing needs. Aggregate levels of investment in housing are discussed, particularly housing performance during the SMP period, which is contrasted with the TMP housing programme (§3.2.2).

As the above quotation from the TMP document illustrates, adequate housing is generally considered to be among the objectives of development. Housing constitutes a component of popular living conditions (and shelter, in the sense of having a secure roof over one's head and the availability of simple infrastructural facilities such as adequate water supply and reasonable drainage), which governments in all developing countries profess they aim to improve, Housing as a goal has received increased prominance now that development is no longer simply identified with economic growth, particularly since the evolvement of a 'basic needs' developmental strategy.

In discussing housing in terms of needs and supply, housing is solely looked at as an objective, yet as mentioned in the second part of the TMP quotation above, housing also has an instrumental value, in the sense that improved housing may directly or indirectly contribute to an improvement in other aspects of aggregate living conditions and in the distribution of income and wealth. At present an extensive literature exists on these economic and social impacts of an increase in housing supply. Based on a survey of this literature, fig. 3.1 has been put together, indicating some of the causal chains suggested.[3] Housing may exert a direct positive influence on two other aspects of living conditions, viz. health and safety. Apart from this, housing may influence a multitude of other variables instrumental to development, mainly through its direct and indirect impact on income, savings, and investment opportunities.

Obviously, the diagram cannot claim completeness. It is clear

3. Drawing particularly on the typology of housing benefits in Burns (1966), the factors mentioned in Abrams (1964, ch. 8) and discussions at various seminars and conferences held on the rôle of housing in development, e.g. Kelly (1955), Nevitt (1967), Friedrich Ebert Stiftung (1973), Soen (1974), International Technical co-operation centre (1975). See however Mitchell (1974), who suggests that the available research evidence indicates that many of the assumed linkages, notably the effects on the residents, do not in fact exist.

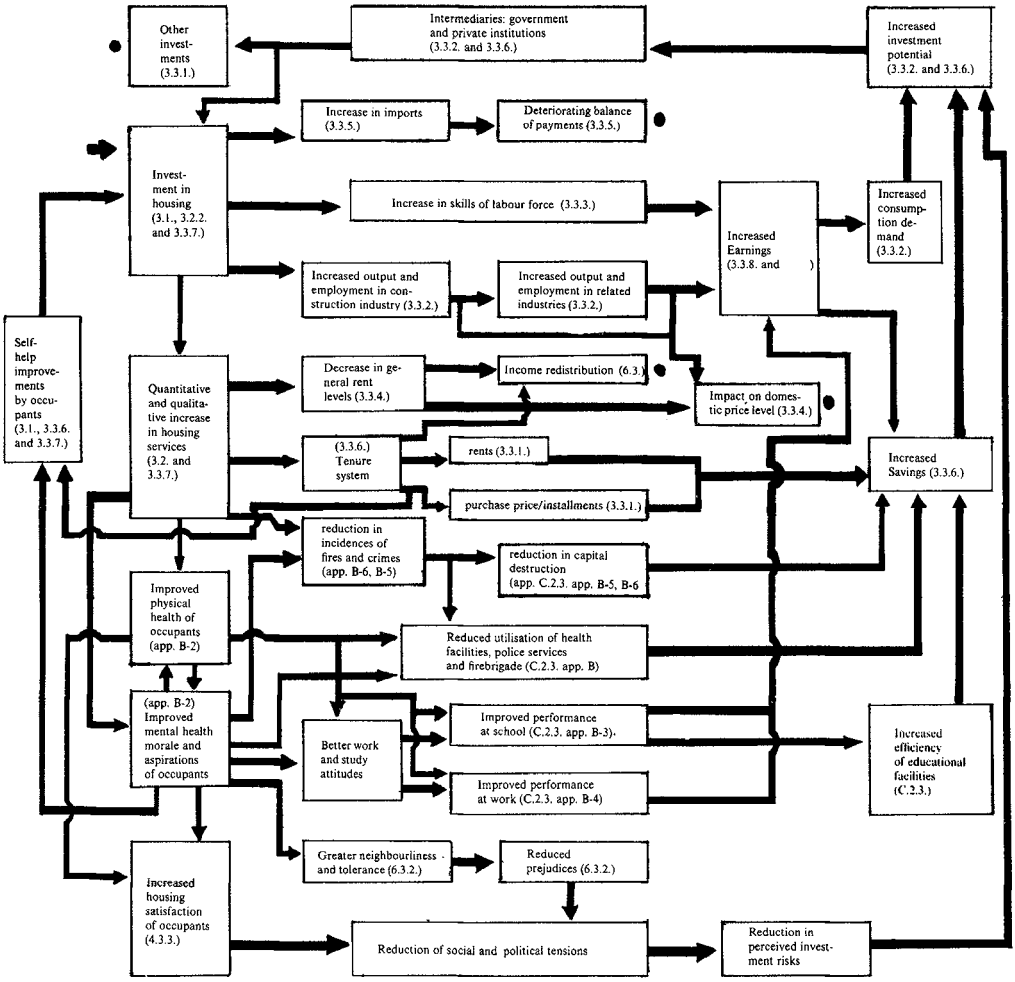


Fig. 3.1 Some potential impacts of an initial autonomous investment in housing.

This diagram is by no means exhaustive. Notably differences in impact of housing in different locations, of different types and standards, and of different income levels of the beneficiaries have not been included. The numbers in parentheses correspond to the sections in which these aspects are discussed.

that other investments (such as in other buildings, infrastructural works or in machinery), income redistribution, as well as changes in the balance of payments and in the domestic price level, will have further impacts on living conditions, even though in these cases an end to the causal chain is indicated in the diagram.

The extent to which the causal effects suggested actually occur depends largely on the nature of the housing investment programme. For instance, it is likely that the impact of improved housing on factors such as tenants' health, education and productivity is important in the case of low-income housing, while probably irrelevant to upper class housing. The balance of payment impact is likely to be different for housing investments using different building technologies; the technology used also has a bearing on the extent of self-help possible in housing construction.

For these reasons most of the causal effects of housing investments will be discussed in relation to the case-study housing schemes introduced in the next chapter (see particularly sections 4.4.3, 6.2, 6.3, 6.5. and appendix B).

However, some aspects can also be discussed fruitfully at a more aggregate level. In section 3.3. some macroeconomic issues related to housing investment are presented, such as the capital-output ratio of housing (3.3.1), backward linkages (3.3.2), skills development (3.3.3), the impact of housing investment on the general price level (3.3.4), on the balance of payment (3.3.5) and on the mobilization of savings (3.3.6). Finally the question of building technology and housing supply is touched upon briefly (3.3.7).

A group which has received special (but not always very favourable) attention from the government, in as far as housing in urban Peninsular Malaysia is concerned, are the squatters (3.4). Squatters are contrasted with slum-dwellers; the extent of squatting in Peninsular Malaysia is estimated (3.4.1) and the socio-economic characteristics of squatters in the Kelang Valley described (3.4.2), as well as their housing conditions and needs (3.4.3). In conclusion, some problems of squatter rehousing attempts by the government are discussed (3.4.4).

3.2. HOUSING AS A GOAL: NEEDS AND SUPPLY IN PENINSULAR MALAYSIA

3.2.1. Housing conditions and housing needs

Housing as a goal is usually expressed in terms of housing needs or shortage (see section 3.1). The concept of need can best be specified as a minimum or average physical requirement per individual or per household. Having established this need, multiplication by a population factor and subsequent comparison with the existing housing stock will show the housing shortage at any given time.

However, to operationalize individual housing requirements is a practically insurmountable task. Clearly, the minimum amount of floor-space required per person varies according to e.g. geographical area, cultural environment and age as well as income level of the individual concerned. Moreover, individual requirements are not only related to minimum physical space standards but also factors such as location (vis-à-vis employment, education, shopping, etc.), tenure, amenities and facilities, security, and other environmental aspects are important (see United Nations, 1973-a, and 1973-b, chapter 1). The relative importance of these factors again is likely to vary according to age and income level of the individual concerned, as well as geographical and cultural environment. This presents a serious weighting problem when aggregating individual needs.

To stop short of allowing each individual to determine his own requirements implies an inherent authoritarian element in the determination of needs per person. Yet even allowing only for broad differences in needs that may apply between groups as a consequence of the above factors may considerably hamper aggregation of these needs into national needs owing to the enormous data requirements.[4] On the other hand, one could argue that in aggregating needs the law of large numbers applies, implying that at higher

4. In United Nations (1973-c), a simple framework is provided to estimate housing needs and shortages, and the housing investment required. Insofar as needs go, a distinction is made between urban and rural households, both differentiated into six income groups. Such income distributional data are not available in many developing countries, see e.g. Chenery and Syrquin (1975, table 2, pp. 12–15).

aggregation levels a statistical concept of needs becomes more valid (compare e.g. Doxiadis, 1968, p. 320).

In order to determine realistically the national housing shortage, data on housing needs and housing stock should be examined at a level of disaggregation in accordance with the differentiation of needs. This means that housing stock data are needed for each geographical area distinguished, providing details such as size, type, tenure, price, available amenities and facilities and locational aspects. This is generally beyond the housing stock data available in developing countries (and many developed countries too). Additional problems arise in projecting future housing needs. Individual requirements may change over time; population growth, migration movements and income developments must be estimated correctly.

For all these reasons it may be best to regard any calculation of housing needs or shortage only as a rough estimate of the order of magnitude of the problem. The United Nations in 1965 estimated that to eliminate existing housing shortages, to accommodate expected population increase and migration, and to replace dilapidated dwellings in developing countries would require an annual construction rate of 8 to 10 dwellings per 1,000 population. However, the actual rate of housing construction in most developing countries is only 2 to 3 units per 1,000 population annually. This indicates that annual housing requirements far outstrip annual housing production in most developing countries, implying that overall housing conditions in these countries are deteriorating rapidly.[5] However the gap may be exaggerated somewhat by the above figures since estimates of housing construction are limited to officially approved units.

Comprehensive data on housing conditions in Peninsular Malaysia are available for 1970, the year in which the most recent population and housing census has been carried out. A total of 1,626,000 living quarters[6] were enumerated in the 1970 census. Of these, 1,601,000

5. More recent data confirm these findings: see U.N. (1976, pp. 91–120, particularly tables 4.6 and 4.10).
6. Defined as: those structures built or converted for living/sleeping and those structures not intended for living/sleeping, but used for that purpose at the time of the census. See Chander et al. (1974, p. 1).

were private living quarters, the remainder being some 13,000 non-private living quarters such as hostels, hotels, hospitals, etc. and approximately 12,000 structures which were inhabited at the time of the census, although they had not been built for living/sleeping purposes. Of the total of 1,601,000 private living quarters, 90.4% were occupied. Some 153,000 units, or 9.6%, were reported as vacant. Only 17.7% of this total (or 1.7% of the housing stock) was available for sale or rent, and thus could be considered relevant for housing market purposes. For 29.4% of vacant units the occupants were temporarily away; 8.3% were unfit for habitation; 5.4% were living quarters for seasonal workers; and for 38.3% no reasons for vacancy could be ascertained. A plausible guess for this last percentage is that it is accounted for by overnumeration, as suggested by the Department of Statistics (1973a, pp. 100–101). In urban areas the vacancy rate was 7.8%, (in cities of 75,000 and above, only 6.6%), in rural areas 10.2%. The age of housing stock is relatively low: in 1970 81.4% of all occupied dwellings in Peninsular Malaysia were less than 30 years old; for rural areas this percentage was 84.4 and for urban areas 71.6.

The aggregate housing shortage in Peninsular Malaysia in 1970 has been estimated by comparing quantitative and qualitative aspects of the housing stock to normative indicators of needs, based on standards of crowding, structural condition and availability (at various levels) of essential amenities, such as toilets, water supply and electricity (see Gibbons et al., 1974, pp. 52–71). Tables 3.1. and 3.2. provide an overview of the position of the housing stock vis-à-vis the criteria used. Although criteria such as the number of households per house, the number of persons per house or per room are rather ambiguous crowding indicators (especially, the concept of 'room' appears to be of little relevance in Peninsular Malaysia: most houses in rural areas are traditionally quite spacious, but have little or no partitioning, while in urban areas most housing units do have rooms, but are less spacious), the overall impression is one of substantial overcrowding, especially in urban areas. Of all South and South-east Asian countries in which housing censuses have been carried out recently, the number of persons per house was higher

TABLE 3.1. Crowding indicators, Peninsular Malaysia (1970).

Indicator	Urban areas	Rural areas	All areas
Number of households* per occupied private living quarter	1.2	1.0	1.1
Number of persons per occupied private living quarter	7.3	5.7	6.1
Household size	5.9	5.5	5.6
Number of rooms** per occupied private living quarter	3.1	2.0	2.3
Number of persons per room	2.4	2.8	2.7

Source: Chander et al. (1974, table IV, p. 6).
*Those persons living in the same house who normally share meals.
**A space intended for living and/or sleeping which is enclosed by permanent or semi-permanent walls or partitions.

TABLE 3.2. Housing quality of occupied private living quarters, Peninsular Malaysia (1970, percentage of dwellings).

	Urban areas		Rural areas		All areas	
Scale score	at	below	at	below	at	below
8. Bathing facilities	12.8	87.2	3.8	96.2	5.9	94.1
7. Toilet facilities (A)	26.4	60.8	5.1	91.2	10.2	83.9
6. Material of walls	13.0	47.9	7.0	84.2	8.4	75.5
5. Water supply (A)	16.3	31.6	5.6	78.6	8.2	67.4
4. Electricity supply	13.1*	18.5*	10.0	68.6	11.1	56.3
3. Water supply (B)	1.5**	17.0**	5.4	63.2	3.8	52.5
2. Toilet facilities (B)	11.3	5.7	38.6	24.6	32.5	20.1
1. Condition	4.1	1.6	19.3	5.3	15.7	4.4
0. None of the above	1.6	–	5.3	–	4.4	–
Totals (absolute)	345,900		1,101,800		1,447,700	

Source: Gibbons et al. (1974, tables 3 and 5, pp. 52–57, respectively).

*Water supply, not electricity supply. **Electricity supply, not water supply.
Toilet facilities (A): flush, inside and exclusive to dwelling
Toilet facilities (B): some kind
Water supply (A): pipe, inside and exclusive to dwelling
Water supply (B): pipe only.

only in South Korea (6.9), most countries having average densities of 5.3 to 5.9 persons per house.[7] Insofar as structural condition and availability of amenities are concerned, table 3.2. provides a distribution of the housing stock over nine quality levels.[8] Each higher quality level incorporates a component additional to the level immediately below: for instance, all dwellings at scale score 4 have electricity supply in addition to the characteristics of those at score 3, piped water, some kind of toilet and a sound structural condition.

To determine the 1970 housing shortage, the following normative criteria have been adhered to in Department of Statistics estimates (see Gibbons et al., 1974, p. 64; Chander et al., 1974, pp. 16–17; Chander, 1976, pp. 18–19): room densities of more than 4.0 persons are considered sub-standard; no lower quality scale scoring than 4 should be accepted.

In 1970, 17.0% of dwellings in urban areas and 26.4% of those in rural areas (24.1% overall) had higher room densities than 4.0, at an average of 6.0 persons per room. To reduce this to 4.0, approximately 113,400 new dwellings should be built, 13,300 of which would be in the urban areas.

The above considerations provide the following picture (table 3.3) of the housing deficit and improvement needs in 1970.

Of course, alternative normative criteria yield different figures for the housing shortage. If, for instance, the following criteria are adhered to:

—average number of households per house should be reduced to 1.0 (this is a more useful criterion than the room-density norm used above in view of the limited relevance of the concept of 'room'); and
—all dilapidated units (including those that are vacant) should be replaced (structural rehabilitation in this case is not considered a feasible alternative[9])

7. In developed industrial countries this figure ranges from 2.7 (Sweden) to 3.8 (Japan).
8. For construction of the scale and detailed contents, see Gibbons et al. (1974, pp. 41–50).
9. Such a policy alternative has hardly been considered at all in Peninsular Malaysia,

TABLE 3.3. Housing deficit and improvement needs, Peninsular Malaysia (1970).

Number of *new* dwellings to be constructed:	Urban areas	Rural areas	All areas
—to achieve the density norm	13,300	100,100	113,400
—to replace dilapidated units (scale score 0 in table 3.2.)	5,600	58,300	63,900
	18,900	158,400	177,300
Number of *existing* dwellings needing improved amenities to reach a quality scoring of at least 4:			
—dwellings needing electricity	53,200	697,800	751,000
—dwellings needing piped water	58,500	637,800	696,300
—dwellings needing toilet facilities	14,200	212,300	226,500

Source: Table 3.2 and text.

then a total housing shortage in 1970 of approximately 112,000 units can be calculated with a shortage of 77,000 units in urban areas and 35,000 units in rural areas. In addition to this, as indicated above, a sizeable number of dwellings, especially in rural areas, are in need of piped water, electricity and improved sanitation.

Projections of future aggregate housing needs using the 1970 data as a base (no comprehensive population and housing data are available for any later year) are even more hazardous, requiring assumptions regarding population growth, household sizes, development of

Footnote 9 (continued)

except in the case of the few monumental (colonial) buildings in major cities, dating mainly from the late nineteenth century. As a policy option structural rehabilitation probably has some limited relevance at present for inner city areas. As noted above the average age of the urban housing stock in Peninsular Malaysia is relatively low compared to the housing stock in most industrialized countries (only approximately 30% of the urban housing stock in 1970 has been constructed prior to the Second World War). In rural areas rehabilitation is a continuous process carried out by the occupants of the dwelling concerned. In view of the prevailing types of structures and building materials used (mainly raised timber houses, having zinc, corrugated iron, thatched or tiled roofing), there appears to be little need for structural rehabilitation as a policy option in these areas.

standards over time as well as the expected rate of deterioration of the housing stock. Some alternative aggregate projections have been provided in Chander et al. (1974) and Chander (1976), estimating housing needs during the TMP period (1976–1980)[10] at 447,000 units (implying an annual construction requirement of 8.0 units per 1,000 population) if existing crowding levels are to remain the same; at 482,000 units (8.6 units per 1,000 population) if a density of one household per house is to be attained; and at 438,000 (7.8 units per 1,000 population) if densities are allowed to deteriorate slightly. It is interesting to observe that in the TMP document the government has opted for the first alternative: 'It is estimated that at least 515,000 units will be required for Peninsular Malaysia during the Plan period to cater for housing needs arising from new household formation, normal replacement and the backlog of 68,000 units from the SMP period.[11] This implies that the government has accepted the norms that aggregate crowding levels should not deteriorate and that a normal annual replacement of 2% of the housing stock (assumed in all Department of Statistics estimates) is necessary. This assumed replacement level is high by international standards, but probably not unrealistic in view of the fact that more than three-quarters of the aggregate housing stock consists of rural dwellings, the expected lifetime of which may be considered substantially shorter than that of the average urban dwelling. For urban areas, estimates of additional housing needs during the TMP period range from 173,000 to 181,000 units, the difference being caused by differences in anticipated urban population growth.[12]

10. Assuming that the 1970 shortage and additional needs caused by household growth and normal replacement during 1971–1975 have been taken care of during the SMP period.
11. Government of Malaysia (1976, p. 334). However it has been indicated that this official backlog figure is much too low. See Ahmad Rahim (1976, p. 2) who estimates a minimum backlog of 165,000 units at the end of the SMP period, based on sustained annual production of 68,000 units during those years. Since in his view construction fell short of that figure (see also section 3.3.1), the backlog is more likely to be approximately 200,000–250,000 units.
12. See Amato, et al. (1975, pp. 7–11). This projection for urban areas also differs substantially from the overall projections in its assumptions concerning the SMP backlog (estimated at 96,000 units for urban areas alone by the end of 1975) and normal replacement requirements (1% only).

Summarizing, it appears that housing needs are substantial, especially in urban areas, where a substantial backlog is likely to have developed during 1971–1975. In rural areas housing problems per se are thought to be less pressing, but an upgrading of the existing stock by providing amenities such as piped water, electricity and toilet facilities is urgently needed.

3.2.2. Aggregate housing investment.

Only limited information on aggregate housing production levels in Peninsular Malaysia is available at present. This is caused by inadequate statistical coverage, which in turn is hampered by the existence of a multitude of both government (at Federal, state and municipal levels) and private institutions in charge of housing construction, as well as by difficulties of incorporating own-account construction. While the first problem is gradually being overcome (estimates of total number of units constructed annually for government and private principals through formal contract construction are becoming increasingly reliable), the second one is likely to persist for some time.

A comparison between output data from the annual surveys of construction industries and national accounts output data for the construction industry for 1969 and 1970 (the most recent national accounts data available in sufficient detail) suggests that these surveys cover only approximately 45% of national accounts construction output. An additional 6% is accounted for by small contractors (less than M$ 1,000 annual output). Apart from government construction classified as outside the industry, the remainder consists of imputed own-account and informal contract construction. As it is likely that almost all non-residential building construction and infrastructural works are carried out in the formal contract construction sector, this gap in coverage is probably much wider for residential construction.

A crude estimate of housing supply, derived from data on the age distribution of the housing stock collected in the 1970 census, suggests that approximately 68,000 new units have been completed annually in Peninsular Malaysia during the years im-

mediately prior to the census (Department of Statistics 1973a, pp. 95–97).

National accounts data suggest that the share of residential construction in GDP and its share in gross domestic fixed capital formation average 2.1% and 14.8% respectively during 1966–1970.[13] These figures are low by international standards.[14]

The first published attempt to provide an overall picture of housing supply refers to the SMP period 1971–1975 (table 3.4). Of the total public sector performance about 50% consisted of low-income housing in urban areas, part of which has been used to rehouse squatters (see section 3.4). In addition to that the timber housing

TABLE 3.4. Housing performance, Peninsular Malaysia (1971–1975).

Category	Number of units built	
Public sector:		86,100
—public housing schemes (Ministry of Housing and Village Development)	13,200	
—State Economic Development Corporation (SEDC) – and other state projects	6,600	
—FELDA (rural) settlers' housing	15,900	
—other Federal agencies' housing projects	26,200	
—Federal institutional quarters (mainly for army and police personnel)	24,200	
Private sector:		173,800
—private developers	64,900	
—co-operative societies and individuals	108,900	
Total		259,900

Source: Government of Malaysia (1976, pp. 332–333).

13. Department of Statistics (1975, tables 1 and 13). These data only provide an order of magnitude in view of the large number of imputations made (such as for own-account construction).
14. For a sample of countries at comparable levels of GDP per capita the share of residential construction amounted to 4.4% of GDP during the same period. See Burns and Grebler (1976, table 1, p. 103). This confirms data for earlier periods. Compare also Grebler (1974, table A-1, p. 32) and Strassman (1970).

units constructed by the Federal Land Development Authority (FELDA) for settlers in its land development schemes constitute the bulk of rural public sector low-income housing. All in all about 70–80% of the public sector programme can be considered low-income housing, which sharply contrasts with the performance of private developers: only slightly more than 1% of their production could be considered as financially within reach of low-income households. The extent of low-income housing supply included in production by co-operatives and individuals is unknown, but it is reasonable to assume that this has been substantial, notably in rural areas.

The data in table 3.4. indicate an annual average of 51,800 units (less than in the previous period), or approximately 5.3 units per 1,000 population, considerably less than the number of units needed to keep up with population growth, normal replacement and back-log from earlier periods (estimated at approximately 8.0 to 10.0 per 1,000 population, see section 3.2.1).

During the TMP period 1976–1980 housing investment in real terms is expected to grow somewhat faster than the overall growth of the economy, as witnessed by the housing programme targeted for this period (table 3.5).

The increase in housing investment will be largest in the public sector as can be seen by comparing tables 3.4 and 3.5. Public sector housing production in Peninsular Malaysia is expected to be more than twice as high as during the SMP period; of this the low-income housing programme of the Ministry of Housing and Village Development (56,800 units in Peninsular Malaysia) will increase more than fourfold as compared to its SMP performance. The FELDA programme will be increased from 15,900 units during the SMP to 33,500, and this together with the programmes for other Federal agencies and regional development authorities will constitute the rural component of the public low-income housing effort under the TMP. Altogether 129,400 units or 58.6% of the public sector housing programme will be for the lower-income groups. The increased priority given to housing is also reflected in the larger share of public development expenditure allocated to it: 3.8% (M$710

TABLE 3.5. Housing programme in units, Malaysia (1976–1980).*

Category	Peninsular Malaysia	Sabah and Sarawak	Malaysia
Public sector	200,000	20,800	220,800
—public housing schemes	56,800	4,300	62,200
—Federal agencies and regional development authorities	53,100	–	53,100
—institutional quarters and other staff accommodation	31,300	10,000	41,300
—Sarawak and Sabah land development boards	–	5,400	5,400
—Orang Asli department	1,500		1,500
—SEDC housing, other state projects Government Officers' Housing Company and other minor programmes	57,300	–	57,300
Private sector	235,800	26,200	262,000
—private developers			100,000
—co-operative societies			12,000
—individuals and groups			150,000
Total	435,800	47,000	482,000

Source: Government of Malaysia (1976, pp. 334–335).

*Insofar as the distribution between Peninsular Malaysia and the Borneo States has not been explicitly stated, this has been estimated based on the development budget allocations in the case of the public sector. For the private sector it has been arbitrarily assumed that 10% of the total will be produced in Sabah and Sarawak.

million) compared with 2.4% (M$235 million) during the SMP period.[15]

Private production is expected to rise by approximately one third.

15. These figures include only the direct sectoral allocations, excluding housing development integrated in government land development projects (approximately M$90 million, incorporated in land development expenditures); institutional quarters for army and police personnel (approximately M$698 million, incorporated in development expenditures for security); as well as the SEDC's commercial housing programmes, their own funded and joint venture projects; other state projects; housing by the Government Officers' Housing Company; and other minor housing programmes (to the extent of M$968 million, not all of which can be considered public housing proper). See also section 2.6.3.

The units expected to be constructed by individuals and groups will largely be located in the rural areas and smaller towns and a sizeable proportion will effectively be low-income housing.

In spite of the increased housing programme of the TMP period, the number of units targeted to be built in Peninsular Malaysia still falls short of the number of units needed as indicated in section 3.2.1, so even if this programme is realized the existing backlog is likely to remain at approximately the same level as at the end of the SMP period.

Moreover, it is open to reasonable doubt whether this programme (an aggregate increase of 70% in terms of number of units over SMP performance) can be realized in toto. Supply bottlenecks can be anticipated regarding government implementation capacity, entrepreneurial capacity in the construction industry, a shortage of professional, semi-professional and skilled construction labour as well as shortages of building materials. Such supply bottlenecks may hamper the execution of the programme and/or be translated into price increases (see also section 3.3.4), especially if expansion of the housing programme coincides with another non-residential property boom and a substantial programme of public works. Manpower constraints are known to have retarded public construction programmes during the SMP period, notably in 1973 at the height of the property boom. In that year supply of building materials too was a constraint on expansion (though more indirectly through price increases), but this was partly induced by the coinciding international commodity boom, affecting trade in building materials such as timber, steel and cement.

3.3. MACROECONOMIC ASPECTS OF INVESTMENT IN HOUSING

3.3.1. Investment in housing and economic growth

Housing, especially housing for low-income groups, until recently has been thought to contribute relatively little to development (which was until the early sixties largely identified with economic growth). In other words, compared with investment in other sectors,

output per dollar investment in housing was thought to be relatively low, implying that in allocating scarce resources the housing sector should receive a relatively low priority (see e.g. Atrans, 1964, pp. 106–107, Burns, 1965, Grebler, 1974). Comparisons of sectoral contributions to development have generally made use of sectoral capital-output ratios as investment criteria. The concept of capital-output ratio plays an important rôle as income generator in the macroeconomic Harrod–Domar type of growth model. Disaggregated versions of this type of model have subsequently been used in development theory, the most well-known being the Mahalanobis two-sector and four-sector models (see Chakravarty, 1959, and compare Chakravarty, 1969 and Blitzer et al., 1975 for a review of multi-sector planning models).

The concept of capital-output ratio, its measurement, its use in planning and in providing explanations and forecasts of development, as well as its suitability as a criterion for resource allocation have caused considerable controversy.[16] While it is not intendend to discuss all these issues at great length, some of the salient points related to resource allocation are mentioned below. On the concept of capital-output ratio, the following statement by Domar is illuminating: '... capital coefficients can be defined, aggregated and disaggregated in so many ways that the fate of a hypothesis may sometimes depend on the particular coefficients used, and what is proved by one set may yet be disproved by another.'[17] Clearly the most relevant concept for resource allocation is the sectoral incremental capital-output ratio (ICOR)[18] usually measured on an annual basis (probably out of statistical convenience). Output in this case may be interpreted either as sales value or as sectoral value added. What is important in the present context is whether the invariably high ICOR's found for the housing sector compared with

16. For examples of elaborate treatment of the issues involved, see e.g. Cairncross (1962, ch. 7), or Myrdal (1968, appendix 3).
17. Domar (1965, p. 95). Myrdal (1968, pp. 1971–1972) provides a survey of more than twenty different ways of defining capital-output ratios.
18. $$\text{ICOR} = \frac{\text{Net or gross sectoral investment per period}}{\text{Increase in sectoral output (value added) during the same period}}$$

other sectors (see below) are sufficient reason for a low allocation of funds for housing. This raises not only questions on the intrinsic merit of sectoral ICOR's as investment criteria, but also on the empirical contents of the concepts of 'investment' and 'output' used in statistical studies.

The sectoral ICOR may be interpreted as the number of periods it takes before an investment in the particular sector in any one period is recouped in terms of output (or value added). It thus discriminates in favour of investments yielding a relatively large output (or value added) in the early phases of the economic life of the investment concerned and against investments where output (or value added) is less readily forthcoming and/or is spread out over longer periods of time (e.g. in the case of perennial crops like rubber and oil palm). While it seems appealing to concentrate on quick-yielding investments, it should be noted that the sectoral ICOR selects in terms of output or value added, not in terms of returns to capital. The necessary labour complementary to the investment is not taken into account. If the share of labour in output/value added is subtracted we may find that an investment yielding a relatively low annual output or value added (resulting in a relatively high ICOR) with a relatively low level of complementary labour and a long economic life may well have a substantially higher rate of return than an investment having a low ICOR, a high level of complementary labour, and a short economic life.

In empirical studies, separate ICOR's are invariably estimated for 'construction' and for 'housing services', the ICOR for construction being low as a consequence of the relatively low capital input in this sector, whereas for housing services capital is almost the sole measured input, resulting in a high ICOR (table 3.6).[19] However, this sectoral split is based on statistical convention. If the two activities were to be looked at combined as 'investment in housing', the ICOR for this new sector would clearly be somewhere in be-

19. See also Roest (1973, pp. 120–122), who summarizes the available evidence from studies by Kuznets, Leontieff, Mukkerjee and Sasbry and his own, and concludes that the ICOR for housing services can roughly be put at four to seven times the ICOR for manufacturing and at two to three times the ICOR for all sectors aggregated together.

tween the low ICOR for construction and the high ICOR for housing services.

In the national accounts system the output of the housing services sector is measured by the payments made by the occupant (rental or imputed rents). If we look at investment in housing as one sector, too, we could say that the direct output of that sector consists of the housing services rendered. However, for various reasons the value of those services is often not adequately reflected by the actual or imputed rents. Apart from clear underestimation of output in cases where rent control is in force and/or where government subsidies are provided (unless this is corrected for in output estimates) in the form of direct rent rebates, interest rate subsidies, land cost subsidies, etc., the basis used for rental imputations in the case of owner-occupied dwellings prodives an additional source of potential underestimation of output. This is illustrated by the Malaysian data in table 3.6. For 1969 onwards a new system of national accounts has been adopted, which differs significantly in respect of concepts, terminology, sources of data and methods of estimation from the national accounts estimates prepared previously (1960–

TABLE 3.6. Overall and sectoral ICOR's[20]

Country	GDP	Housing services	Construction industry
India[a]	2.2	11.0	0.14
USA[a]	5.0	7.1	0.08
Peninsular Malaysia, 1961–68[b]	3.2	11.8 (13.1)	n.a.
Peninsular Malaysia, 1970–71[b]	3.3	8.0 (8.9)	0.7 (1.9)[c]

[a] *Source:* Tinbergen (1967, tables 4, 8 and 9, pp. 80, 104–105 and appendix D and E).
[b] GDCF/ΔGDP and sectoral equivalents as computed from Department of Statistics (1975). Figures between brackets are equivalents based on value added instead of sales value.
[c] 1970 only.

20. See also Balassa et al. (1971), table 2.4, (p. 38), where the overall ICOR for Peninsular Malaysia has been estimated at 3.1 for the period 1950–67.

1968). The following is one of the more material changes related to housing; 'Data limitations in the compilation of the former series resulted in low estimates for the "imputed" sector of *ownership of dwellings*. The result of the Household Expenditure Survey, 1973, provided a more realistic benchmark for these estimates in the new series, . . .' (Department of Statistics, 1975, p. 56). Apparently the overall ICOR has hardly been affected materially, but the ICOR for housing services computed from the new series was only two-thirds of the ICOR computed from the old one. In addition, it is obviously important to know whether value added or sales value is taken as 'output' in the ICOR estimates, since the ratio of value added to sales value differs from sector to sector. As shown in table 3.6, in the case of housing services and construction in Peninsular Malaysia the use of value added rather than sales value tends to narrow the gap between the ICOR's for the two sectors.[21]

A related point, affecting the magnitude both of investment and of output, is that the impact of self-help construction, extension or improvement by the occupant of the dwelling has been imputed in the national accounts estimates. It has also been suggested that services rendered by housewives should be included in the national accounts as the labour complementary to the housing services, in which case the ICOR for the housing sector clearly would be much lower. This is another example of how the magnitude of sectoral ICOR's are determined by statistical convention. More generally, these aspects point to the importance of non-monetary activities (see e.g. Zimmerman, 1975, p. 415) and how little is known about them.

In addition, the indirect output of housing, such as its impact on productivity in other sectors, is not captured in the national accounts concept of output to the extent that externalities are involved.[22] Finally, since the notion of development at present is

21. Value added in construction is estimated to amount to approximately 35% of gross sales value in 1970 in Peninsular Malaysia. For housing services the comparable figure is 88%.

22. See e.g. Smith (1970, pp. 208–212) for a discussion of this aspect.

moving away from identifying development with economic growth as such, any investment criterion that only measures an activity's contribution to growth becomes increasingly less relevant.

Thus it is concluded that on conceptual grounds a sectoral ICOR is not a very suitable investment criterion in the process of development. This is compounded by the fact that in practice both 'investment' and 'output' are measured in an arbitrary way, determined by statistical convention (as are, of course, sectoral definitions). This is especially important for investments having substantial indirect outputs, as has been claimed for sectors such as education, health and housing (see e.g. Beckerman, 1972, International Bank for Reconstruction and Development, [IBRD], 1975b, pp. 25–29 and 1975a, pp. 17–18).

3.3.2. Backward linkages[23]

These linkages can be discussed both in terms of income and employment created in the sectors of the economy that generate housing inputs. To the extent that they are not (directly or indirectly) imported, these inputs are generated in the construction industry, and the transport and manufacturing sectors.

In order to estimate the income impact of backward linkages associated with housing investment, the multiplier of such investment is sometimes calculated with the aid of an input-output framework. In this way the ultimate expansion of aggregate demand caused by an initial expenditure on housing investment is estimated by calculating its primary factor costs proportion, i.e. the shares of imports, labour, profits and indirect taxes, and applying those proportions to the well-known Keynesian multiplier formula (with some added assumption regarding the marginal savings, taxation and import propensities of factor incomes). This is attempted below for residential construction in Peninsular Malaysia. However, it should be noted that this approach can only be an approximate one, because the multiplier concept is ill-suited to the dynamic analysis

23. Additional income and employment generated as a consequence of increased demand for inputs. See Hirschman (1959).

needed to accommodate over time the successive rounds of income increments caused by the initial expenditure. This also begs the question of how price increases (notably changes in relative prices) must be accommodated. Moreover, the multiplier approach assumes complete absence of supply bottlenecks in the economy. Finally, input-output data available in most countries (if available at all) are usually insufficiently disaggregated to enable a separate analysis of the expenditure effects of investment in housing. Generally, only a construction sector is distinguished of which housing typically comprises only 30–40% (see United Nations Industrial Development Organization, [UNIDO] 1969, table 3, p. 15, and p. 53).

Bearing these limitations in mind, it is noteworthy that studies carried out in several countries (Colombia, India, Korea, Mexico and Pakistan) all estimate the expenditure multiplier of investment in housing to be around two[24] and it is generally contended that this is a high figure as compared to multipliers for other sectors.[25] This difference is explained by the relatively low import content of housing investment and its relatively high labour content, combined with the assumption of relatively low savings, import and taxation propensities of labour used in housing investment. These aspects are discussed below in some detail.

Although the direct and indirect import content of housing varies from country to country (depending on factors such as size and per capital income level of the country concerned as well as the level of development of local construction and building materials industries), it is undoubtedly low as compared to the import content of aggregate domestic expenditure. Importable items may consist of building materials, building equipment and/or their components. However for some building materials such as bricks and tiles, their relatively low value/weight ratio means that transport costs of im-

24. See Grimes (1976, p. 32) and the references quoted there.

25. Ibid. See also Roest (1973, pp. 110–111), who for the Netherlands estimates the multiplier for investment in construction at two, as compared to 1.5 for investment in machinery and transportation. Lubell (1974, pp. 68–70) estimates the multiplier for construction of urban infrastructure in Calcutta at 1.6.

ports are prohibitive. In certain circumstances this may not apply, for instance in the case of materials for which a small local market does not justify domestic production, in cases where world market prices for materials are high (e.g. sawn timber during 1973–74), or in countries where certain essential materials cannot be produced due to a lack of primary resources (some Middle East countries can hardly avoid importing saw logs or timber). In contrast, the import content of the quantitatively much less important category of equipment[26] is generally quite high.

The United Nations Industrial Development Organisation (UNIDO)[27] considers an accumulated (direct and indirect) import content of construction of approximately 32% typical for developing countries having a per capita GNP of US$ 100 per annum, but available country studies suggest much lower levels.[28] This also applies to Malaysia with its relatively small and open economy (the gross import content of aggregate domestic expenditure for Peninsular Malaysia was 46% during 1969–1972) but fairly well developed construction and building materials industries, as indicated below in the accumulated primary factor costs proportions estimated for residential construction (Peninsular Malaysia) 1969–1972:[29]

26. Data from the annual surveys of construction industries, Department of Statistics, Malaysia, indicate that, for residential construction industries in Peninsular Malaysia, costs of hiring plant, machinery, building and transport equipment plus depreciation on owned machinery, building and transport equipment averaged only 1.9% of total output during 1969–1972 as compared to 56.5% for building materials. As mentioned above (3.2.2) these surveys cover only approximately 45% of national accounts construction output, an additional 6% being accounted for by small contractors (less than M$ 100,000 annual output), the remainder consisting largely of government construction classified as outside the industry in the surveys, and imputed own-account construction.
27. UNIDO (1969, pp. 17–19). Of the 37% quoted in table 5 in this publication, 5% consists of payment of factor incomes abroad, which does not constitute imports in the national accounting sense of the word.
28. Burns et al. (1970, pp. 134–136) found percentages of seven and ten for Mexico and South Korea respectively. However, it is not clear whether the indirect import content has been accounted for in these cases.
29. Estimated from data in: Department of Statistics, Malaysia, annual surveys of construction industries, and *1970 Input-output tables, Peninsular Malaysia*, (1976); and The Treasury, Malaysia (1975 Annual Economic Report, statistical appendix, table 1.1).

Labour income	0.363
Entrepreneurial income	0.374
Imports	0.218[30]
Indirect taxes	0.045

Value added in residential construction amounted to 39% of output during this period, consisting of 25% wages and salaries, 13% entrepreneurial income and 1% indirect taxes. Hence the share of labour income in value added on site was nearly twice the share of entrepreneurial income. For the primary cost components of residential construction these shares were roughly equally large (see above). This indicates that production on site is probably more labour-intensive than production in the sectors providing inputs. However, this conclusion cannot be drawn with certainty, since it is difficult to get an impression of the rate of capital utilization. The share of depreciation and hiring of capital equipment (including buildings) used on site was 5% of value added, but no such data are available for the input sectors. In addition, the incomes of small producers of building materials, of traders as well as transport margins are wholly accounted for as entrepreneurial income rather than labour income. However, in those cases such incomes should largely be viewed as a reward for entrepreneurial labour, rather than return to capital. Similar problems arise in comparing investment in housing with investment in other sectors. At best one may expect that housing construction is probably slightly more labour-intensive than manufacturing, but certainly less so than agriculture in Peninsular Malaysia.

To estimate the multiplier value for housing investment in Peninsular Malaysia with the aid of the accumulated primary cost components listed above requires an assumption on marginal taxation, saving and import propensities of labour (L) and entrepreneurial (E) income. While no data are available to substantiate any such assumption specifically for labour and non-labour income in the primary cost components of housing construction, it is probably quite safe to say that saving and taxation out of entrepreneurial income is

30. Of the total import content of 21.8%, 12.2% was directly imported.

generally higher than out of labour income. Concerning imports it is not unreasonable to assume that higher incomes have higher import propensities.

If the following marginal propensities are assumed:

$$MPS_L = 0 \qquad MPS_E = 0.3$$
$$MPM_L = 0.1 \qquad MPM_E = 0.2$$
$$MPT_L = 0.1 \qquad MPT_E = 0.3$$

a multiplier for investment in housing of 1.6 is reached. In contrast, the aggregate expenditure multiplier for Peninsular Malaysia during 1969–1970 is estimated at approximately 1.35, using the same multiplier formula.[31]

A relatively high multiplier value in terms of expenditure also suggests substantial employment generating possibilities. However, differences in employment effects between industries or countries having the same value of expenditure multiplier may arise from differences in wage levels and productivity. Some light may be shed on this matter by estimating the Relative Incremental Employment to Output Ratio (RIEOR)[32] for various sectors. Estimates for Malaysia during 1971–1975[33] are as follows:

Primary sector	0.30
Construction	0.57
Manufacturing	0.61
Tertiary sector	0.62
Aggregate	0.45

31. $\frac{1}{MPS + MPM + MPT}$ The estimate of the aggregate expenditure multiplier for Peninsular Malaysia is a rough one, using national accounts data (new series). See Department of Statistics (1975, tables 1, 3 and 15).

32. RIEOR $= \frac{\Delta L}{L} \Big/ \frac{\Delta P}{P}$, in which $\frac{\Delta L}{L}$ is the percentage growth of employment and $\frac{\Delta P}{P}$ the percentage growth of output (value added). See Zimmerman (1975, p. 417)

33. Sectoral employment elasticities as used in the TMP document to project sectoral employment growth. See Government of Malaysia (1976, table 4.4, p. 56; footnote 16, p. 66; table 4.10, p. 68).

This seems to indicate that employment elasticities are at similar levels for all non-agricultural sectors. Such a conclusion is rather surprising in view of the expected relative labour intensity in construction versus manufacturing. In the primary sector, underemployment in agriculture (see section 5.3.3) is likely to account largely for its low RIEOR.

However, these estimates only provide information on employment growth compared to value-added growth in each sector itself. Little quantitative evidence is available on the total employment effects of investment in housing. Some additional information is available relating to the indirect employment generated in the sectors delivering inputs to housing construction as a consequence of increased housing output.[34] However these data do not consider the employment generated by the expenditure on consumption goods out of primary factor income earned, i.e. the calculation is limited to the employment effects of first-round spending only. If average wage levels in the sectors supplying inputs to housing construction are equal to those in on-site employment, indirect employment in supplying sectors would amount to 0.45 times on-site employment for housing construction in Peninsular Malaysia during 1969–1972. To estimate total employment generated, including employment generated through the successive rounds of expenditure out of primary factor incomes requires an assumption regarding the value added per worker in the industries producing the consumption goods bought out of primary factor incomes in addition to the above data. Assuming that this value added is equal to the value added per worker in the housing construction and input industries combined, and accepting the above values of the expenditure multiplier and the ratio of indirect employment to direct employment on site, then total employment generated can be very tentatively put at approximately 2.3 times direct employment on site.

34. This indirect employment has been estimated at 1.0 times on-site employment in the case of Singapore, see Teh Cheang Wan (1973, p. 11) and 0.6 to 1.7 for various types of housing development in Mexico, see Organization for Economic Co-operation and Development (1973, table A-9, p. 32).

3.3.3. Housing investment and skills development in construction and other industries

It has often been suggested that additional housing investment contributes to an increased level of skills of the labour force through on-the-job training. While it must be conceded that similar learning-by-doing effects apply to employment in all industries it is likely to be particularly important in the construction industry because in almost any developing country educational facilities to develop construction skills through formal schooling and training programmes are grossly inadequate, and skills in the construction industry are still generally passed on through apprenticeship (see de Wilde et al., 1973, p. 19). This also applies, albeit to a lesser extent, to the management of construction firms and of housing schemes. However, in view of the more sophisticated job requirements in the latter two cases, formal schooling can most probably contribute substantially to human resource development in these fields, while, regarding manual construction skills on-the-job training may well be more effective than formal schooling. However, the possibility of apprenticeship for unskilled labour in the construction industry is often restricted by filial or ethnic barriers and by the technical constraints of the production process. It should also be noted that in the case of housing investment this informal training is almost completely limited to the construction phase: during the operating phase only management, repair and maintenance of housing schemes may offer some learning-by-doing possibilities. In this respect housing contrasts unfavourably to the construction of industrial plants, where on-the-job training is important during both the construction and the operating phases (even though in the case of industrial schemes operating skills may be more difficult to acquire and would often require formal education).

Quantitative estimates of on-the-job training aspects of housing construction are extremely scant. Limited data available for Peninsular Malaysia, based on a questionnaire survey among contractors, associations and vocational schooling institutions, suggest that an average period of approximately two years of on-the-job training is required to increase the level of an unskilled construction worker

to semi-skilled level. This means that the worker concerned has acquired the basic skills of a particular trade, e.g. bricklaying, carpentry, bar-bending etc. and is able to apply these techniques to the job at hand under supervision. A semi-skilled worker earned approximately 45% more than an unskilled labourer in 1974. An additional period of 2 to 3 years is required to reach the fully skilled level, being fully proficient in the job, able to work independently, to take measurements and to read plans. As one respondent put it: 'he should not only appreciate the how, but also the why of the work he does'. An earning differential of approximately 55% existed between skilled and semi-skilled labour in 1974. (see Wegelin, 1975, pp. 130–132).

It should be noted, however, that the abovementioned barriers imply that only a limited number of workers could realize such benefits of learning by doing.

3.3.4. Housing investment and the domestic price level

There are two possible ways in which increased investment in housing may influence the domestic price level:

—increased output of housing may exert a depressing influence on the overall price/rent level of the existing housing stock; and
—increased investment in housing may create temporary supply bottlenecks in the fields of building materials, labour, or entrepreneurial capacity, raising prices of these inputs, which in turn may lead to increased prices of housing and other construction.[35]

The first possibility is solely related to housing output. Assuming initial equilibrium in the housing market and leaving aside for the moment the non-homogeneity of the housing services offered,[36]

35. Land prices, too, may be influenced by increased housing investment. However, since this impact will generally be restricted to specific locations, the magnitude of the price change depending on the characteristics of the particular site, its ownership and land market restrictions, this will not be referred to at this general level of discussion.
36. Including non-market conform government intervention in the housing market or some of its segments.

rents of additional housing units should be below prevailing market rents. The influence of this additional housing investment on the general rent level would then depend on the price elasticity of demand (relative inelasticity of demand is required for any appreciable decrease in rent levels) and the size of the housing investment vis-à-vis the existing housing stock. Its actual impact is likely to be limited, because in most developing countries a severe housing shortage exists, which means that any new housing having rents below the existing market rate will cater to this 'excess demand' and will have a minimal influence on the general rent level. Even in the unlikely case of temporary excess supply only a limited impact can be expected. This is caused by the phenomenon of downward 'stickiness' of rents, resulting from long leases (often combined with the expectation of capital gains on the part of landlords) and segmentation of the housing market. Finally, due to the durability of housing, annual housing investment is usually small compared to the total housing stock, limiting its impact on the general rent level yet further. All this means that only in exceptional cases, such as the large scale public housing programme in Singapore[37] will additional housing investment exert a downward pressure on house prices and rents.

As mentioned, increased housing investment may also create input supply bottlenecks. Whether this impact will be a serious one depends on the elasticity of supply of inputs and on the size of the additional demand generated for these inputs compared to total demand. The magnitude of this additional demand is determined by various factors, such as the magnitude of the additional housing investment, its input proportions, the extent to which additional housing investment is financed by shifts of funds from other sectors

37. This programme, initiated in 1960, has provided 120,000 units of public low-income housing during 1960–1970, accommodating nearly 30% of Singapore's population in 1970. With another 125,000 units planned during the third five-year plan 1971–1975, it was expected to raise this percentage to 50 by 1975 and ultimately to provide public housing to 75% of the population. The programme has not resulted in lower nominal rents, but has stabilized rents and house prices for low-income groups in the face of a rising overall domestic price level. See Ho Cheng Choon (1973).

and the degree to which released inputs in these sectors can be used in housing investment. In the case of building materials domestic supply bottlenecks can sometimes be overcome by increased imports, but this would raise prices and aggravate foreign exchange scarcity (see section 3.3.5). Burns et al. (1970) have estimated the impact of increased construction output on the domestic price level in South Korea and Mexico. This study indicated that, at least during the period studied (1955–1965), a 1% increase in construction output implied price increases for building materials of 0.45% and 0.31% respectively.[38] Since building materials had a low weight in the overall wholesale price index in both countries, the authors concluded that the impact of increased construction output on the overall domestic price level was slight. However, these results must be interpreted very cautiously: the regression analysis used in the above study only reveals an association, not causality. Recent events in Peninsular Malaysia illustrate the limited value of such calculations (see also table 3.7). From 1972 to 1973 prices of major building materials rose by an average of 25% (some, such as timber prices, by more than 50%), while the consumer price index rose by 10.5%. No doubt the domestic construction industry experienced a boom during the period (value added in construction rose by 11% in real terms) but this coincided with an international commodity boom (exports of saw logs and sawn timber – important building materials – registered a volume increase of 11% and 27% respectively, for instance). The impact of both phenomena are difficult to separate. The international commodity boom contributed to supply problems in the construction industry (especially concerning sawn timber, iron and steel products, together comprising 43% of building materials input in residential construction), and now that both property and commodity booms are over (1975), prices of materials have dropped considerably (see Malaysian Business, Nov. 1973, pp. 10–13; and Jan. 1976, pp. 15–23).

Supply bottlenecks in the fields of labour and entrepreneurial

38. Burns et al. (1970, pp. 127–134). These elasticities are based on a regression analysis, with the price index of building materials as the dependent variable and construction output in square metres and a time variable as independent variables.

TABLE 3.7. Indices related to supply bottlenecks (1969 = 100)

	1969	1970	1971	1972	1973
Volume Malaysian exports[a] (1970 prices)	100	102.1	107.4	109.9	130.4
Value added, construction[b] Peninsular Malaysia (1970 prices)	100	103.5	117.0	122.4	135.7
Price Index, building materials used in residential construction, Peninsular Malaysia[c]	100	110.2	111.9	116.4	145.1
Index labour costs, residential construction, Peninsular Malaysia[d]	100	106	112	119	129
Consumer Price Index Peninsular Malaysia[e]	100	101.9	103.5	106.8	118.1

Sources:

[a]The Treasury (1975 Annual Economic Report) and Bank Negara Malaysia, Quarterly Economic Bulletins.

[b]Government of Malaysia (1971, p. 31 and 1976, p. 12).

[c]Department of Statistics (1973; mimeo) and additional data.

[d]Data from Public Works Department.

[e]Bank Negara Malaysia, Quarterly Economic Bulletins.

capacity are likely to arise for skilled labour, technicians, professionals and semi-professionals such as management staff, architects, surveyors, engineers and draughtsmen. (see de Wilde et al., 1973, pp. 18–20; and Higher Education Advisory Council, Malaysia, 1973). Such bottlenecks apply less to unskilled labour in a labour-surplus economy, although restrictive practices along e.g. filial or ethnic lines may render the market for unskilled labour less than fully competitive.

Such supply bottlenecks take considerable time to alleviate through increased output of graduates from institutions such as vocational training centres, technical colleges and universities. However, some skills are also transferred by on-the-job training (see section 3.3.3). While shortages of professional and semi-professional labour may persist for a considerable period of time, and thereby hamper expansion of construction output, the impact of this on the domestic price level will probably be slight, since

labour costs of this kind typically account for only a small percentage of construction costs (1.5% for residential construction, Peninsular Malaysia). Percentages for skilled labour are generally higher (approximately 14%)[39] but it can be assumed that the time needed to overcome supply bottlenecks in this field is generally shorter. However, unlike building materials prices, wage rates generally respond only very slowly to increased supply.

3.3.5. Housing investment and the balance of trade

An increase in investment in any sector influences the balance of trade in many ways. Some factors often referred to and which have a direct impact on the balance of trade are listed below:

A. the accumulated import content of increased sector investment inputs;
B. the extent to which inputs are diverted from exports;
C. the share of exports in the accumulated final demand for increased sector output;
D. the extent to which this output substitutes for imports;
E. the extent to which the increase in investment gives rise to imports of inputs elsewhere in the economy (this could happen if some inputs are used in other sectors too); and
F. the extent to which increased output of the sector enables increased exports of close substitures produced elsewhere in the economy.

In addition, a number of more indirect influences are important, for instance the impact of additional complementary activities and the propensity to import out of additional primary factor incomes generated by the increased investment.

The importance of the factors above depend not only on the resource endowment of the country concerned and its size, on the characteristics of the particular sector in which the investment

39. Estimated from annual surveys of construction industries, Peninsular Malaysia. Figures refer to on-site labour only.

takes place, and the investment size[40] but also on the possible sectoral shift of resources caused by the additional investment.[41] For instance, if resources are released from a sector using some of the necessary inputs for the increased investment, this has a direct bearing on A, B and E. In addition changes in relative prices both domestically and on international markets caused by shifts in demand resulting from the increased investment will influence the aove factors. In the case of housing investment, factors C, D and F seem to be of little relevance. The end product of the housing sector is not exportable or importable as a rule, and its direct foreign exchange earning capacity therefore is nil. However it is sometimes held that improved housing increases labour productivity in other sectors (see appendix B-4). To the extent that this applies to export-oriented industries or import-substituting industries, increased investment in housing may indirectly earn foreign exchange.

As has been mentioned above (section 3.3.2), investment in housing has a relatively low accumulated import content (A), but the extent to which material inputs are diverted from exports (B) is difficult to estimate in general terms, as is the impact of increased housing investment on imports of inputs elsewhere in the economy (E). Much depends on the resource endowment of the country concerned and the size of its domestic market via-à-vis its foreign trade. For the various types of conventional public low-income housing schemes in Peninsular Malaysia discussed in subsuquent chapters, it has been estimated that the impact of factors A, B and E combined implied a maximum content of 'tradeable' inputs of 33–39% in the early seventies.[42]

Similar proportions have been found in Kenya (see Hughes, 1976, table 3.7, p. 62) while a study on the Mexican housing industry indicated a somewhat lower percentage (see Organization for Economic Co-operation and Development, 1973, p. 212). As a result of

40. Sizeable additional investment may create sufficient economies of scale to produce some inputs locally which initially were imported.

41. Such a shift takes place if the increased investment represents a sectoral reallocation of investment funds rather than an increase in aggregate demand.

42. See also Wegelin (1975, pp. 62–66 and appendix 5, pp. 220–225). Note that this is a considerably higher percentage than the accumulated import content for residential construction (factor A only), estimated to be 22% (see section 3.3.2).

data problems, the assumptions made in all these estimates were rather strong and one should be very cautious in comparing these figures with the 'tradeables' content of output produced by other sectors (moreover, output in other sectors may itself be tradeable – see factors, C, D and F above). Also the 'tradeables' content may differ substantially within the housing sector itself, depending on the type of housing (although the Kenyan data indicated that differences for a wide range of housing were not all that large, the content ranging from 29% to 40%). While the above data suggest a negative balance-of-trade effect of increased investment in housing, the impact through complementary activities could possibly bring about a different result. For instance, Burns et al. (1970) have shown that this effect is alleviated or may even be reversed in the case of improved housing for workers in export industries, if it can be assumed that their productivity is favourably affected by housing improvement. Incorporation of this indirect housing output in their estimates of the balance-of-trade effect of housing investment in Mexico and South Korea led to a small negative net result for Mexico and a small improvement in the balance of trade in the Korean case (see Burns et al., 1970, pp. 134–136). However it is also quite conceivable that housing investment attracts investment in other sectors for which the 'tradeables' content is even higher than for housing.

3.3.6. Housing investment and the mobilization of savings

There is by now sufficient evidence suggesting that even low-income groups in developing countries will save out of income, provided sufficient rationale for this is perceived by these groups (see e.g. Jørgensen, 1975, p. 60; Lee Hock Lock, 1971, pp. 15–16; Hollsteiner, 1975, p. 213). The main problem lies in providing a savings rationale that appeals to the households concerned and that would also divert their savings from holdings of unproductive assets such as gold, jewellery, or cash savings, towards the financing of development.[43] It has also been suggested that relatively undeveloped financial

43. Lee Hock Lock (1971, pp. 3–4, p. 166 ff.) A highly successful example in Malaysia in this respect is the Pilgrims' Fund, in which large sections of the Muslim population, particularly from the lower-income groups, save to finance their pilgrimage to Mecca. This

systems are a constraint on the total amount of savings available for investment. This certainly applies to housing finance (Jørgensen, 1975, pp. 60–61). If appropriate financial intermediaries could be established, housing finance need not impinge on other investments. While the initial seed capital needed to start a housing programme will have to be made available at the expense of other potential investments it is clear that in the long run substantial additional household savings can be mobilized through housing investment in the form of annual rentals or instalments paid by the occupants. These funds can then be reinvested in housing. The extent to which such a 'revolving fund' may expand depends on the overall financial viability of the programme (this does not preclude subsidized low-income housing, but it does imply that such subsidies could only arise through cross-subsidization, if it is stipulated that the fund should not shrink).[44]

In Peninsular Malaysia financial institutions are relatively well developed. It has been estimated that existing intermediaries providing housing finance (commercial banks, borrowing companies, the Employees Providence Fund (EPF) – providing loans to building societies – as well as Federal and state governments) should have no difficulties in making sufficient funds available to finance the ambitious housing programme of the TMP (see Jamal Mohamed, 1976). However in the present institutional setting this will only be achieved by stipulating that financial institutions maintain a specific percentage of total loans in approved housing loans (at present a ruling is in force whereby commercial banks and borrowing companies are required to maintain a minimum of 50% of their savings deposits in the form of small loans under the so-called Credit Guarantee Corporation scheme, approved housing loans or government securities).

Footnote 43 (continued)

provides a strong saving incentive, since, according to the teachings of Islam, this pilgrimage (the Haj) is a religious duty that every genuine Muslim should perform at least once.

44. See e.g. Bell (1974), for an account of the operation of the National Housing Bank of Brazil which has managed to mobilize substantial savings while at the same time offering attractive terms to finance low-income housing.

Such ruling may eventually unduly restrict total investment. It should be possible to avoid this and also to tap additional savings, notably in the lower-income groups. Measures outside the credit sphere, which may enhance the mobilization of savings through home ownership, could include sale of public low-income rental units to the tenants and providing some form of legal tenure (preferably leasehold) to squatters in those areas where land use will remain residential. Needless to say such measures would have to go hand in hand with more flexible ways of financing housing.

Savings of low-income groups can only be mobilized if housing credit facilities available are adapted to their specific situation. This would require a number of measures such as reducing the extent of down-payment (currently 30% of purchase price), extension of credit to types of housing currently discriminated against (notably timber housing), stretching of repayment period (currently generally 12–15 years), credit facilities to finance parts of a house (e.g. roofing), or for extensions to and improvements of existing structures. Such measures could be realized if government guarantees were provided. In addition to that, individual subscribers to EPF could be allowed to use their contributions to finance part of their housing requirements.

3.3.7. Building technology and housing supply

Housing provision is by its nature heterogeneous, not only in view of differences in locations, but also because of differences in type, design, target groups of occupants, etc. Such differences have a bearing on building technology used. While there is scope for discussion of differences in building technology, their pros and cons have been extensively reviewed in the literature[45] and for that reason this section will only briefly describe the range of possible housing choices and their related technologies.

For a long time housing provision has been conceived predominantly in terms of the finished product: a detached house, a

45. The following publications provide a useful overview: International Bank for Reconstruction and Development (1975a), Grimes (1976), Soen, ed. Housing (1974) and International Technical Co-operation Centre (1975).

semi-detached house, terraced houses, walk-up flats, high-rise flats. As noted in section 3.1 there has been a growing interest in so-called 'second-best' solutions recently, which means anything short of the finished product. These incorporate site-and-services schemes in their various forms, core-housing, as well as improvement and upgrading (see Burns, 1975).

Site-and-service schemes are those in which a parcel of land is sub-divided (sometimes after initial levelling) and these plots are then provided with some or all of the following services: access roads, footpaths, water supply, drainage, sanitary facilities and electricity. Sometimes community facilities such as schools, clinics, refuse collection, police and fire stations are provided. The level of services provided may vary greatly, depending on such factors as the ability to pay of future residents, the physical nature and location of the land, and the organizational capacity of the government departments involved. The residents are supposed to provide the physical structure of their house themselves. The essence of this approach is to provide a framework which enables a target group of low-income households to obtain substantial improvements in housing environment at costs within their means (see Patel, 1974, International Bank for Reconstruction and Development, 1974, p. 3, Grindley and Merrill, 1971, pp. 7–10). By recognizing that location vis-à-vis markets and jobs, security of tenure and availability of basic services may be at least as important as the amount of space per household and the structural characteristics of the house, this approach appears to be a very useful complement to the 'regular' public housing approach. It has been shown in a number of cases that once the former elements are incorporated in a scheme low-income occupants are quite willing and able to build their own houses gradually over time, either through their own efforts or through a system of mutual self-help, co-operatives, etc.[46] However, some further assistance may be needed, such as provision of or loans for building materials, and technical assistance from

46. See e.g. Grindley and Merill (1971, pp. 29–31 and Appendix A), Solaun et al. (1974), Kessler (1974), Modavo and Haldane (1974), Vernez (1974 and 1975), Mittelbach (1974), United Nations (1973d), and Martin (1975).

skilled craftsmen, but this, of course, differs from scheme to scheme. This approach is potentially very fruitful when eventual construction of detached, semi-detached or terraced houses is considered. In the latter two cases, co-ordination problems are much greater than in the former, which means that the possible extent of self-help will be less in these two cases. In the case of terraced houses especially central provision of some form of core-housing would seem to be almost inevitable. The core provided in such schemes usually consists of a sanitary cell and sometimes one or more rooms.

The site-and-services approach has been in use for some time in Peninsular Malaysia, for example to resettle squatters (see section 3.4), notably in Kuala Lumpur. During 1965–1971, nine such schemes, comprising a total number of 7,630 plots, have been launched in various areas around Kuala Lumpur by the Selangor state government. However the experience with these schemes has not been a very happy one. All schemes are located relatively far from Kuala Lumpur and this means that cheap and regular public transport should be provided. In addition it means that such schemes need to be fairly self-contained. Yet when a survey was carried out in mid-1973, of the nine schemes three did not yet have access roads, in none of the schemes had the internal road system been constructed completely (in four schemes there were no internal roads whatsoever), in seven schemes no drainage system was available, while water supply was still lacking in one scheme. Generally land had been reserved for community infrastructure facilities such as places of worship, markets, schools, playgrounds, clinics, community halls, shops and police stations, but in most cases these facilities were not yet available. The lack of proper facilities may account for the fact that nearly 35% of the lots were still vacant at the time of the survey, although government administrative problems may have been the reason that some lots had not been allocated. Subsequently remedial action was promised by the state government department primarily responsible, but it is not known to what extent this has materialized. An important problem in this case was that the government lacked sufficient supervisory

manpower to ensure that structures were erected in accordance with some basic norms (e.g. that only a certain proportion of the lot provided was used for the erection of the structure proper). This lack, combined with the slow provision of the necessary infrastructural facilities (resulting mainly from an insufficient capability of the state government to co-ordinate such provision by the various authorities concerned) points to a factor often overlooked in discussions on site-and-services schemes, being the substantial administrative and organizational effort required for such schemes to succeed, much more so than in case of conventional housing.

On the other hand some potential advantages are obvious: lower costs, greater use of domestic building materials (particularly timber), greater flexibility in the construction process. Influenced by the increased attention for the site-and-service approach on the part of international organizations such as the World Bank, a number of such projects have been included in the housing programme of the TMP. Special attention will be paid to organizational problems in implementation, lack of construction skills and problems of financing the procurement of building materials by the occupants (Government of Malaysia, 1976, pp. 335–337; Ahmad Rahim, 1976, p. 22).

The core housing approach has been adopted by the Malaysian government in FELDA land development schemes and in some villages. In the FELDA schemes this approach has been largely successful in the sense that many of the original housing units have been enlarged and improved upon by their settler owners over time (Ahmad Rahim, 1976, p. 24).

Another 'second-best' solution mentioned consists of upgrading and improvement. This, combined with some form of legal land tenure, has been advocated and applied in those cases where it was found impossible to remedy the housing situation for a large number of the urban poor in a more comprehensive way. This approach involves the provision of some public utilities such as water supply, footpaths and drainage in lower-income areas (provided the site characteristics and housing densities allow this; see e.g. International Bank for Reconstruction and Develop-

ment, 1975a; Aroni, 1975; United Nations, 1971). However, this comparatively short-term solution is limited in scope and not suitable for providing an improved housing environment for central city slum-dwellers and densely-housed squatters (section 3.4), nor for those peripheral squatters, whose area is liable to flooding or is inaccessible. For this last category the site-and-service approach would be appropriate, but for the former some kind of 'regular' high-density public housing is unavoidable, if the advantages of close proximity to jobs, markets, schools etc. are to be maintained. High land costs preclude low-density solutions in such cases and in providing walk-up or multi-storey flats the self-help concept is out of place.

Upgrading and improvement has only been applied in a very ad hoc manner in urban areas in Peninsular Malaysia, such as in cases where squatters in a particular area have been able to exercise some political leverage with the local authorities in order to get their area supplied with water (stand-pipes) and/or electricity. For rural areas such improvements are incorporated in the rural electrification and water supply programmes.

In the TMP document it is indicated that an attempt will be made at squatter area improvement.[47] An interesting pilot project is currently being carried out in Salak South, a squatter area in the south-eastern part of Kuala Lumpur, where a combination of second-best housing options will be provided; the scheme is being carried out in three phases (partly financed by a loan from the World Bank) and will include site-and-service lots, core housing units, as well as upgrading and improvement of existing squatter areas.

Standard housing estates (not only flats, but also detached, semi-detached and terraced houses) can generally be produced through use of conventional techniques or through a variety of industrialized building systems. Most of these systems, rather than stress labour-using techniques have been designed to lower costs through labour saving innovations, which does not seem to be very appropriate in

47. This is an interesting policy change, since it implies providing some form of legal tenure to the squatters concerned, which previously had not been considered at all seriously.

labour-surplus, developing countries (although this surplus pertains primarily to unskilled labour – as mentioned, in Peninsular Malaysia it takes several years for unskilled construction labour to acquire skills through on-the-job training). Even in developed countries it has often been doubted whether these systems have really produced the cost savings they were supposed to bring about.[48] The experience of those developing countries that have experimented with such systems has not generally been a happy one and the prospects for use of such systems in developing countries can only be described as dim.[49]

In Malaysia two experimental industrialized low-cost, high-rise housing projects have been carried out, one in Kuala Lumpur (3,000 units) and one in Penang (3,700 units). These projects are generally regarded as not very successful, mainly because they have failed in precisely those aspects where superiority over conventional construction techniques is claimed:[50] the schemes turned out to be more expensive than comparable projects utilizing conventional building techniques and provided inferior housing quality in respect of leakages and noise problems.[51]

This does not mean that all elements of such industrialized systems are unsuitable in developing countries. Some innovations which could increase the efficiency of tradtional building, such as modular co-ordination, are potentially very useful. As in other fields, here too an 'intermediate' technology is called for, blending traditional building practices with relevant innovations, especially in the field of building materials,[52] but perhaps also in view of potential short-

48. See e.g. Howenstine (1972) for a discussion of the varied cost impacts of industrialized building systems in Europe.
49. An excellent and highly critical discussion of the merits of industrialized building systems in developing countries can be found in Strassman (1975).
50. The construction system used was the Hochtief-Estiot one, consisting of pre-cast reinforced concrete wall and floor panels, factory prefabricated. A special feature of these panels was the use of a lightweight steel skeleton. The conventional technique used in comparable high-rise housing schemes would typically involve gradual construction of a reinforced concrete skeleton, including floors (cast on site) and utilization of bricks and/or timber for wall panels.
51. For a somewhat more flattering assessment, see Jagatheesan (1973).
52. See Terner and Turner (1972, part IV) for an elaboration on this point.

ages of particular skills of labour. Examples of such innovations are the use of standardized concrete blocks, lightweight prestressed ceiling beams, of timber treated to make it fire-resistant and more durable, and the use of lime instead of cement (see also Moavenzadeh, 1974, pp. 232–239).

However, introduction of such technologies is not a matter of relevant innovations alone. Often the dominant technology is firmly embedded in existing value systems, administrative routines and building bye-laws. For instance the use of treated timber for low-income housing in urban areas in Peninsular Malaysia (a logical choice in view of its widespread availability and low costs) instead of bricks is virtually precluded by status considerations combined with existing bye-laws prohibiting the use of timber in urban areas (which was sensible when treatment was not possible). Although these by-laws are likely to be changed in the near future, not many treated timber projects will materialize unless present practices in the fields of housing finance and fire insurance which discriminate against timber (for instance, fire insurance premiums for timber houses, whether treated or untreated, are 3 to 4 times higher than for comparable brick structures) are also altered.

The above shows that a wide range of housing options are possible. Without going into details at this general level of discussion, it is clear that each option will have its particular problems and that the various options will have different impacts on development at large. Clearly different cost levels are associated with differences in the extent of housing improvements and differences in construction technology. These factors also greatly influence the import content of inputs and consequently the domestic income multipliers and employment effects of housing programmes.[53] On the output side differences in the extent of housing improvement can be expected to differ in their direct and indirect impacts, notably in those impacts related to health, educational and job performance.

53. See Organization for Economic Co-operation and Development (1973) in which the employment effects of both single-family and multi-family housing of different cost levels in Mexico are analysed.

3.4. SQUATTER SETTLEMENTS

3.4.1. Squatters and slum-dwellers

Urban housing needs are especially acute for the lower-income groups, who, contrary to those in higher income brackets, have little opportunity to convert their housing needs into effective demand for officially approved housing units. Official housing standards are often unrealistically high, pushing approved housing beyond the financial possibilities of the lower-income groups. Adequate financial mechanisms to finance housing for these groups are often lacking. Furthermore, supply of housing is often limited by outmoded building codes and imperfect factor markets (including the land market) causing high housing costs, and by rent controls. This intensifies demand for those housing units actually produced, pushing up rentals or sales prices, in which process low-income groups invariably lose out. Therefore their housing options are often restricted to resorting to squatting or adding to existing housing densities in approved dwellings. Thus squatter settlements and slums have in common that they generally house a substantial proportion of the urban poor. Apart from that, the two terms refer to different sections of the housing stock, although they are often mentioned in one breath, sometimes interchangeably.

Squatters are generally defined as those who are in illegal occupation of land. The implication of this is that their settlements are uncontrolled, public infrastructural facilities are not usually extended to these areas and for fear of eviction there is little incentive to build sound and lasting housing.[54] In contrast, slum-dwellers generally are in legal possession of their premises. These consist of run-down, dilapidated and often overcrowded dwellings, which are generally located in downtown areas. Slum-dwellers usually have access to all infrastructural facilities. At least in Kuala Lumpur, their main problem appears to be overcrowding and the

54. See Abrams (1964, ch. 2), Sen (1973a and 1973b), Taylor (1973) and Turner (1969). Vernez (1974 and 1975) has studied the so-called 'pirate settlements' in Bogota, Colombia. Contrary to 'regular' squatting, a legal-ownership transfer of lots has taken place in these settlements, but occupation of the lots in the absence of basic public services is illegal. Furthermore the dwellings built by the occupants may or may not comply with the local building code.

structural condition of the housing units they live in (see Kuppusamy, 1969, pp. 7–8; and Jackson, 1975).

The extent of squatting and slums is considerable in almost all major cities in the developing world. Around 1970 the percentage of city population living in slums and squatter settlements ranged widely from city to city, but figures of 20% to 50% are common, while even figures of 90% have been reported.[55]

In Peninsular Malaysia, squatting is most prevalent in Kuala Lumpur; in other urban areas the phenomenon seems to be of much less importance. The following estimates of squatters as percentages of town populations in 1973/1974 were made available from various sources (mainly town councils and state development officers) for other major towns in Peninsular Malaysia:

Alor Setar	: 3.3%	Ipoh	: No information available
Georgetown	: 5.5%		
Johore Bahru	: 5.7%	Malacca	: No information available
Kelang	: 4.2%		
Kota Bharu	: None	Petaling Jaya	: Negligible
Kuala Trengganu	: 5%	Seremban	: No information available
Kuantan	: 4.1%		

As to Kuala Lumpur Municipal Area,[56] some information is provided on the next page. While inaccuracies in the estimates for the number of squatter households may have caused some distortion, an explanation for the slight drop of the squatter percentage over time may be offered. First, many of the rural migrants – potential squatters – into the Kuala Lumpur conurbation (see table 2.6) settle at the urban fringes, sometimes outside the former municipal limits

55. See International Bank for Reconstruction and Development (1975a, Annex 2), in which data are provided for 66 cities in 43 countries. Since definitions vary from country to country, these data provide only an order of magnitude. It appears that percentages are generally highest, almost all in the 50–80% range, for African cities (which are comparatively small, but have very high growth rates), followed by the Latin American ones, for which figures of 40–50% seem to be characteristic, while in most Asian cities figures range from 10–40%.

56. Comprising approximately 36 sq. miles from 1957 (population 470,000 in 1970). On February 1st., 1974 the Kuala Lumpur Federal Territory was created, an area of 94 sq. miles (population estimated at 850,000 at that time), including virtually all of the former Kuala Lumpur Municipal Area.

Year	Estimated total number of households[a]	Estimated number of squatter households	Squatter percentage
1968	82,700	26,500[b]	32.0
1973	95,000	29,000[c]	30.5

[a]Derived from 1970 population and housing census, taking into account 4.3% underenumeration of the census for urban areas (Department of Statistics, 1974a) and a 2.8% annual population increase (average annual increase for Kuala Lumpur Municipal Area, 1957–1970).

[b]Kuala Lumpur Municipality (1970, p. 3).

[c]See Sen (1973b, p. 19), who also estimated the number of slum-dwellers at 10% of the population of municipal Kuala Lumpur.

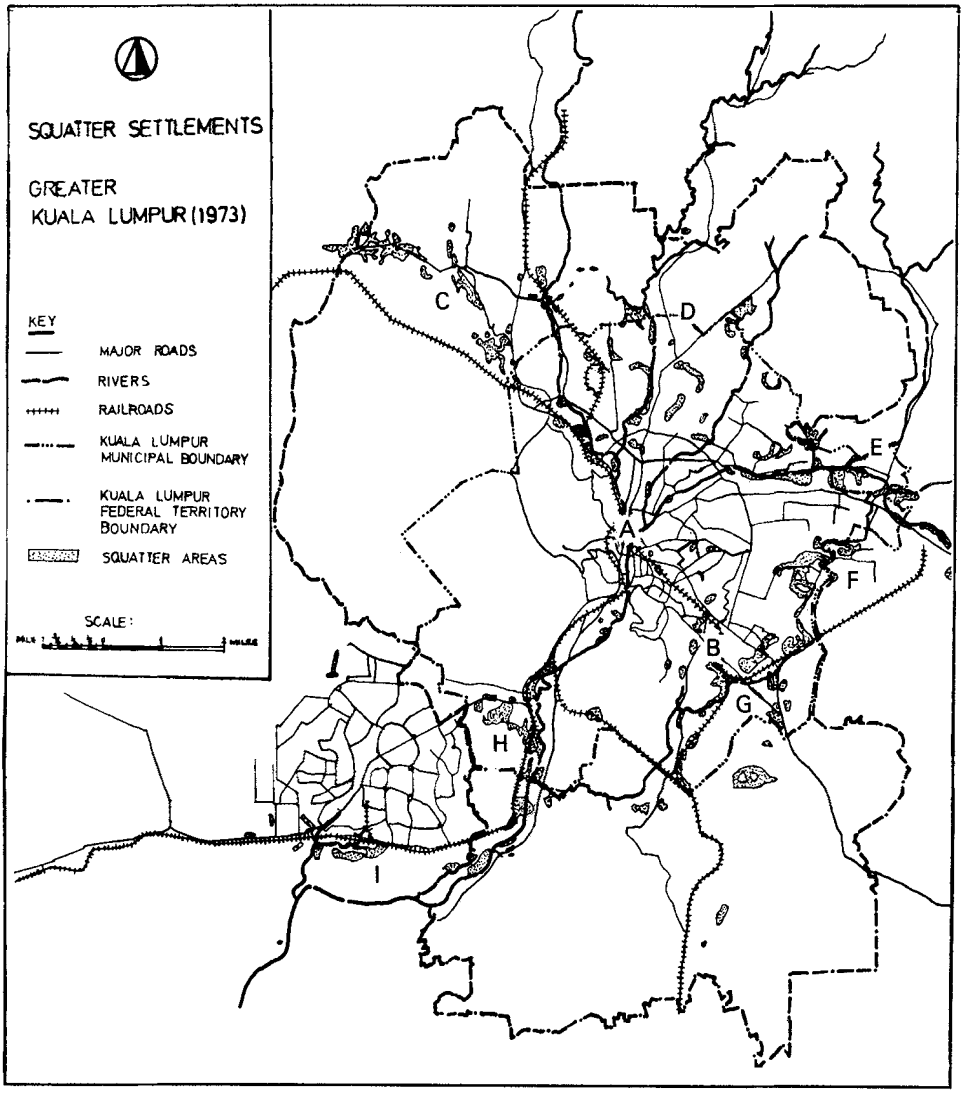
(compare map 2). Furthermore the squatter areas that have been cleared by the government and private landowners are virtually all within these limits. What is clear from the data however is that the government's squatter rehousing and resettlement efforts during 1968–1973 (see section 3.4.4) have at best been able to prevent the squatter population from growing faster than the overall population in the Kuala Lumpur municipal area. Total squatter population in Kuala Lumpur conurbation may well have increased faster than its overall population growth. While no estimates on this are available squatters were estimated to make up approximately 30% of all households in Kuala Lumpur administrative district (comprising 351 sq. miles) in 1973. Total number of households in the district are estimated at 169,500 in that year[57] which means an estimated 51,000 squatter households. Unfortunately no more recent data are available.

3.4.2. Location and socio-economic characteristics of squatters in the Kelang Valley area

Squatters in the Kelang Valley area (defined here as the administrative districts of Kuala Lumpur and Kelang, see map 3)[58] are mainly

57. Derived from 1970 population and housing census, taking into account 4.3% underenumeration of the census for urban areas and 3.9% for rural areas (Department of Statistics, 1974a). An average annual population growth rate of 3.3% for urban areas and 2.4% for rural areas (actual rates for West Malaysia, 1957–1970) has been assumed for the district.

58. This is a more restricted definition than that used in the Kelang Valley Regional Planning and Development Study, May 1973.



Map 2

located in greater Kuala Lumpur, Kelang and Port Kelang.

Squatters in greater Kuala Lumpur tend to be located along railway lines, river banks, near disused mining ponds, and in outlying areas (see map 2). This pattern clearly reflects the smaller

chance of eviction from such reserve and waste areas than from urban areas subject to rapid development. Only pockets of squatters remain within central areas of Kuala Lumpur, and many of these lie along what geographically is a 'low-pressure trough', between the historically separate centres of downtown Kuala Lumpur (A) and Pudu (B). Large squatter areas today are located on the urban fringe, in the north-west (C – Kepong, Jinjang and Segambut), in the north (D – Sentul and Setapak), in the north-east (E – Kampong Datuk Keramat and Ampang Jaya), in the east (F – Kampong Pandan), in the south-east (G – Salak South and along Cheras and Sungei Besi Roads), and in the south-west (H – Kampong Kerinchi, Pantai, Bangsar), and in the Petaling areas (I).

Within Kelang municipality squatter areas are predominantly found in Port Kelang. In the royal town of Kelang itself not many squatter areas are left after the clearing and subsequent development of large squatter areas in the centre. In Port Kelang squatter areas are heavily concentrated in the old port area, where squatters make up a large proportion of the resident population. They are highly visible, both in its central area and on the southern fringes.

The characteristics of squatter households in the Kelang Valley presented in tables 3.8 and 3.9 are based on a sample survey of 2,200 squatter households living in Kuala Lumpur, Kelang and Port Kelang carried out in 1973 (Wegelin, 1974). Where possible a comparison is made with earlier studies, notably the squatter census carried out by the Kuala Lumpur municipality in 1966/68.

The ethnic distribution of squatter households in Kuala Lumpur in 1973 was estimated to be as follows: Malays 25.3%, Chinese 65.1%, Indians 9.6% (Sen, 1973b, p. 20). These proportions have changed rapidly over time, presumably mainly because of inmigration (predominantly Malays from the rural areas). Compared with 1966/1968, the proportion of the Malays has increased considerably (Malays 20.6%, Chinese 67.8% and Indians 11.6% in 1966/68).

The data on income distribution in table 3.8 should be treated with some caution, notably in comparing data from both squatter surveys on the one hand and the Post-Enumeration Survey (PES)

TABLE 3.8. Percentage frequency distribution of monthly household incomes (in M$)

Monthly income in M$	Squatter Households								All urban households Peninsular Malaysia 1970
	Kuala Lumpur, Kelang and Port Kelang, 1973				Kuala Lumpur, 1966/1968				
	Malays	Chinese	Indians	All	Malays	Chinese	Indians	All	
Below 100	4.9	4.9	10.8	5.4	12.5	7.0	17.1	9.2	10.7
100–200	66.2	44.7	64.3	52.1	61.3	47.5	61.7	51.5	26.0
200–300	18.6	30.3	18.7	26.3	18.5	29.1	14.5	25.4	20.2
300–400	6.1	14.1	4.1	11.1					12.6
400–500	1.6	3.3	0.4	2.5	7.8	16.5	6.7	13.9	7.8
500–600	1.6	2.6	1.7	2.3					4.8
600 and above	1.0	–	–	0.3					17.9
Mean	$194	$226	$178	$213	$181	$216	$171	$203	$428
Median	$167	$201	$160	$189	$161	$191	$153	$179	$266

Sources:
Kuala Lumpur Municipality (1970).
Government of Malaysia (1973, table 1–1 and 1–2, pp. 3–4), and additional data from Department of Statistics. (Data obtained in the Post-Enumeration Survey, 1970 Housing and Population Census).

data for 1970 on the other. The former two dealt only with cash incomes, whereas the latter also took into account imputed value of income in kind. However, for urban areas distortion in comparisons arising from this is thought to be much smaller than for rural areas. Apart from that, problems of possible under-reporting and differences in household sizes between ethnic groups and between squatter households and urban households in general limit the usefulness of comparisons somewhat.

Bearing the above in mind it appears that a large proportion of squatters in Kelang Valley could be classified as urban poor at all prevalent definitions of the 'poverty-line', such as:

—households having a monthly income of less than M$300 (current prices). This is the cut-off eligibility level for municipal and state government low-cost housing. Nearly 90% of Malay squatter households were below this level, 80% of the Chinese squatters and approximately 94% of the Indians in 1973;

—the poorest 40% of the population.[59] PES data suggest that the national cut-off level according to this criterion could be put at approximately M$27 monthly per capita household income in 1970. This implies an overall cut-off level of monthly household income of M$150 in that year. Allowing for a 33% increase in GNP per capita (current prices) during 1971–1973 and for a larger household size in urban areas (5.9 in 1970) than for Peninsular Malaysia as a whole (5.6 in 1970), and assuming that the income distribution did not deteriorate or improve during 1971–1973, this works out at a cut-off level of M$210 per month for urban household incomes in 1973. Bearing in mind the presumably higher level of consumer prices in urban areas as compared with rural areas (unfortunately, no reliable data are available on this),[60] it appears conservative to postulate that, in 1973 at least, all urban households earning less than M$200 per

59. This World Bank inspired relative poverty-line concept has been used by the Treasury, Malaysia (1974, p. 85) and in the paper by Robless in Chee and Khoo siew Mun. eds. (1975).

60. Tentative estimates put this differential at 20% to 30%. See Thillainathan (1976, p. 45 and Chapter V).

month were included in the poorest 40% of the population. As shown in table 3.8, in 1973 nearly 58% of Kelang Valley squatters were earning a monthly household income below that level (Malays 70%, Chinese 50%, Indians 75%);

—the household income needed to satisfy minimum nutritional and non-food requirements.[61] This has been estimated for 1970 at M$33 per capita per month, and allowing for a 16% increase in consumer prices during 1971–1973 and the same household size assumptions as above this would have been approximately M$225 in 1973 for urban areas.

Table 3.9 provides information regarding a number of other basic characteristics of squatter households. Regarding household size, these data confirm earlier findings that Chinese and Indian households are generally larger than Malay ones. Although a close comparison with earlier surveys is not possible in view of differences in frequency intervals, mean household size found for all households (5.63) is much lower than the similar figure provided by the 1966/1968 survey (6.79). It is interesting to compare these figures with the overall mean household size for Kuala Lumpur municipal area (5.4) and the figure for all urban households in Peninsular Malaysia (5.9), as obtained in the 1970 housing and population census.

As to the age of the household head, it appears that heads of Malay households are generally much younger than Indian and even more than Chinese household heads. This is not suprising since Malay households generally are smaller and have lived in the squatter areas for a shorter average period of time, conveying the picture of young families having recently migrated from rural areas. In contrast, Chinese and Indian squatter areas generally have been established for a long time, a situation reflected in the age of household head, household size and period of residence in the area. Overall, it appears that the majority of the squatters have been squatting for more than 5 years, Malay squatters forming an exception to that pattern (again, probably reflecting the larger prevalence of

61. This absolute poverty-line concept has been adopted by the government in the TMP document. See Government of Malaysia (1976, p. 160).

TABLE 3.9. Some characteristics of squatter households, Kuala Lumpur, Kelang and Port Kelang, 1973 (percentage of household and means).

Characteristic	Malays	Chinese	Indians	All
Household size (number of persons)				
2 or less	15.6	12.9	8.4	13.1
3–5	43.0	35.6	44.5	38.5
6–8	28.6	30.3	32.4	30.0
more than 8	12.8	21.2	14.7	18.4
Mean	5.24	5.86	5.64	5.68
Age of household head (in years)				
below 20	0.8	0.6	0.4	0.6
20–29	35.7	6.4	14.9	14.6
30–39	35.9	21.7	29.0	26.0
40–49	16.7	22.0	26.8	21.1
50 and over	10.9	49.3	28.9	37.7
Mean	35.1	46.3	41.9	43.0
Period of residence in the squatter area (in years)				
less than 3	20.1	8.6	7.2	11.4
3–5	31.3	18.1	28.7	22.5
6–10	31.7	34.2	39.2	34.0
11–15	8.6	5.5	12.0	7.0
16 and above	8.3	33.6	12.9	25.1
Mean	6.9	10.4	8.3	9.3
Type of tenure				
Renting	33.9	44.3	52.3	42.4
Own house	66.1	55.7	47.7	57.6
Amount of rent paid (in M$ per month, those households that are renting only)				
less than 10	0.3	2.0	—	1.4
10–20	26.5	28.2	20.7	27.0
20–30	50.4	39.6	70.7	45.3
30–40	14.2	16.1	8.6	14.9
40 and above	8.6	14.1	—	11.4
Mean	25.43	26.12	23.79	25.79

recent migrants among Malays). This pattern has been noted in earlier surveys (Kuala Lumpur Municipality, 1970; Azizah binte Osman, 1970, pp. 19–20 and p. 80).

Nearly 60% of the squatters were occupying their own house in 1973. In the 1966/1968 surveys this figure was 50.5%. An interesting feature revealed by those surveys is that out of squatters living on private land only 14% lived in their own house, whereas among squatters living on state land, this figure was 69%. For those squatters who were renting their house, the monthly rent has been tabulated. A comparison with data from the 1966/1968 surveys shows that on the aggregate squatters' rents have increased considerably. In 1966/1968, 14.9% of all households paid M$10 or less per month, 37.0% between M$11 and M$20, 35.3% between M$21 and M$40 and 12.8%, M$41 and more.[62]

The type of employment of squatters correlates with the income data provided in table 3.8. The vast majority of them are hawkers, small traders, skilled and semi-skilled factory workers, drivers, taxi-drivers, unskilled labourers, security guards, attendants, clerks and waiters. A small minority are teachers, executives, traders and landed proprietors.

3.4.3 Housing conditions and needs of squatters

Squatters in the Kelang Valley area mainly live in plank houses with zinc roofing (only in Port Kelang area thatched roofs are more prevalent). Malay squatters, following rural housing traditions, generally build their houses on stilts, in which case floors consist of planks too. In non-Malay squatter areas (perhaps even more than in 'regular' residential areas, ethnic divisions are very much in evidence in squatter areas), this generally is not the case and flooring would generally consist of a crude cement slab or of pounded earth.

Internal crowding indicators are listed in table 3.10. Comparable data for a number of squatter households rehoused in government low-income housing and for all urban households are provided as a perspective. Squatter households appear to live in more

62. Calculated from data in Kuala Lumpur Municipality (1970).

TABLE 3.10. Crowding indicators, squatter households

Indicators	Squatters in Kuala Lumpur and Port Kelang, 1973[a]	Kuala Lumpur squatters 1966/1968[b]	Kuala Lumpur rehoused squatters 1973[c]	Urban households in Peninsular Malaysia[d]
Average number of households per house	1.44	1.36	1.0	1.2
Average number of persons per house	8.18[e]	9.23	5.44	7.3
Average number of persons per room	2.72	2.95	2.29	2.4
Average household size	5.68	6.79	5.44	5.9
Average number of rooms per house	3.01	3.13	2.38	3.1

[a]Based on data regarding 2,200 squatter households reported on in section 3.4.2.
[b]Source: Kuala Lumpur Municipality (1970).
[c]Based on data regarding 740 rehoused squatter households in Kuala Lumpur.
[d]Source: table 3.1.
[e]Based on data regarding 1,240 squatter households in Kuala Lumpur.

crowded conditions than urban households generally; differences are mainly caused by differences in number of households per house and possibly by differences in average household size (here the available information is conflicting). Differences in number of rooms per house are slight; only rehoused squatters have a significantly lower average in this respect.

External densities vary greatly from one squatter area to another when calculated on the basis of housing units, but even more so when densities per household are calculated. The number of houses per hectare varies from 5 to 142, most prevalent figures being 50–70 houses per ha. in central areas and 40–50 in fringe areas. Densities per households are substantially higher than densities per house in central areas but such differences are negligible in outlying areas as

could be expected.[63] A comparison with government low-income housing yields the conclusion that gross housing densities in single-storey terrace housing schemes (including internal roads and drains) are much lower (30–35 units per ha.), those for four-storey walk-up flats somewhat higher, ranging from 120 to 160 units per ha., while of course densities for multi-storey flats are much higher.[64] The (non-)availability of amenities and the type of sanitary facilities used are important factors in the housing environment of squatters. The data in table 3.11 reveal that only a small percentage of squatters have electricity and piped water available.
Note the relatively high level of availability to squatters on private land. The level of availability according to 1973 data is low because the majority of the interviewed squatter households lived on state land. Overall availability level of amenities for squatters in Kuala Lumpur in 1973 has been estimated at approximately 25% for water and 20% for electricity (Sen, 1973a, p. 7), not much higher than 1966/1968 levels.

Table 3.12 indicates that compared with all households in Kuala Lumpur, squatters have a considerably lower availability level of toilet and bathing facilities. Concerning toilets, this is not only reflected in the low percentage of households using the flush or bucket system (38.9% for all squatter households as compared with 84.1% for all households in Kuala Lumpur), but also in the high percentage of households that have to share their toilet facilities with other households (78.7% for all squatter households – including river or stream). In the case of bathing facilities too, differences lie predominantly in their exclusiveness: the vast majority of squatter households using common stand-pipes whereas an overwhelming proportion of all households in Kuala Lumpur had their own tap. A second (quantitatively less important) feature is the heavier reliance on wells by squatters. While the 1973 figures may not be representative for all squatter areas in Kuala Lumpur it is estimated

63. Average for all areas: 35 houses per ha. and 41 households per ha. Based on data for 10 selected squatter areas with approximately 1,100 houses (1972).
64. Based on data for 8 housing schemes comprising 2,800 units (1972).

TABLE 3.11. Availability of electricity and piped water (percentage of households)

Amenity	Squatters, Kuala Lumpur, Kelang and Port Kelang, 1973	Squatters, Kuala Lumpur[a]			All households, Kuala Lumpur Municipality, 1970[c]	All urban households, Peninsular Malaysia, 1970[c]
		Private land, 1968	State land, 1966	Combined[b]		
Electricity available	13.9	58.0	3.7	19.5	73.0	83.0
Piped water exclusive to dwelling available	18.0	66.0	7.4	24.4	65.2	81.5[d]

[a] *Source*: Kuala Lumpur Municipality (1970).
[b] Of the total number of squatter households in 1966/1968, 64% were living on state land and 36% on private land within Kuala Lumpur municipal area.
[c] *Source*: Department of Statistics, 1970 Population and housing census.
[d] Inclusive of piped water outside living quarters.

TABLE 3.12. Type of sanitary facilities used (percentage of households)

Facilities used	Squatters, Kuala Lumpur, Kelang and Port Kelang, 1973.		All households, Kuala Lumpur, 1970[a]	
	exclusive to household	shared by more than one household	exclusive to dwelling	shared by more than one dwelling
Toilet				
Flush	0.5	1.0	48.1	4.4
Bucket	6.4	31.0	15.3	16.3
Pit	14.4	35.7	4.9	4.3
River or stream	11.0		5.2	
None	—		1.5	
Bathing facilities				
Own tap	11.5		88.1[b]	
Stand pipe	79.1		5.0	
Well	9.2		6.1	
River or stream	0.2		0.7[c]	

[a] *Source*: Department of Statistics, 1970 Population and housing census.
[b] Separate bathrooms, other enclosed bathing spaces and taps inside the house.
[c] River, drain, canal and other.

that 35% of squatter households have no acceptable sanitation (Kuala Lumpur Minicipality, 1970, appendix B; Sen 1973a, p. 7).

Summarizing, apart from the lack of land title and the resulting lack of security of tenure, general housing problems in squatter areas pertain mainly to internal crowding, lack of sanitary facilities and amenities like piped water and electricity; these deficiencies in turn cause further problems of e.g. animal pests, health hazards and fire risks (section 4.3.3 and appendix B). Problems related to structural conditions of the houses and house densities vary considerably from one area to another.

3.4.4. Problems of present squatter rehousing attempts in the Kelang Valley area.

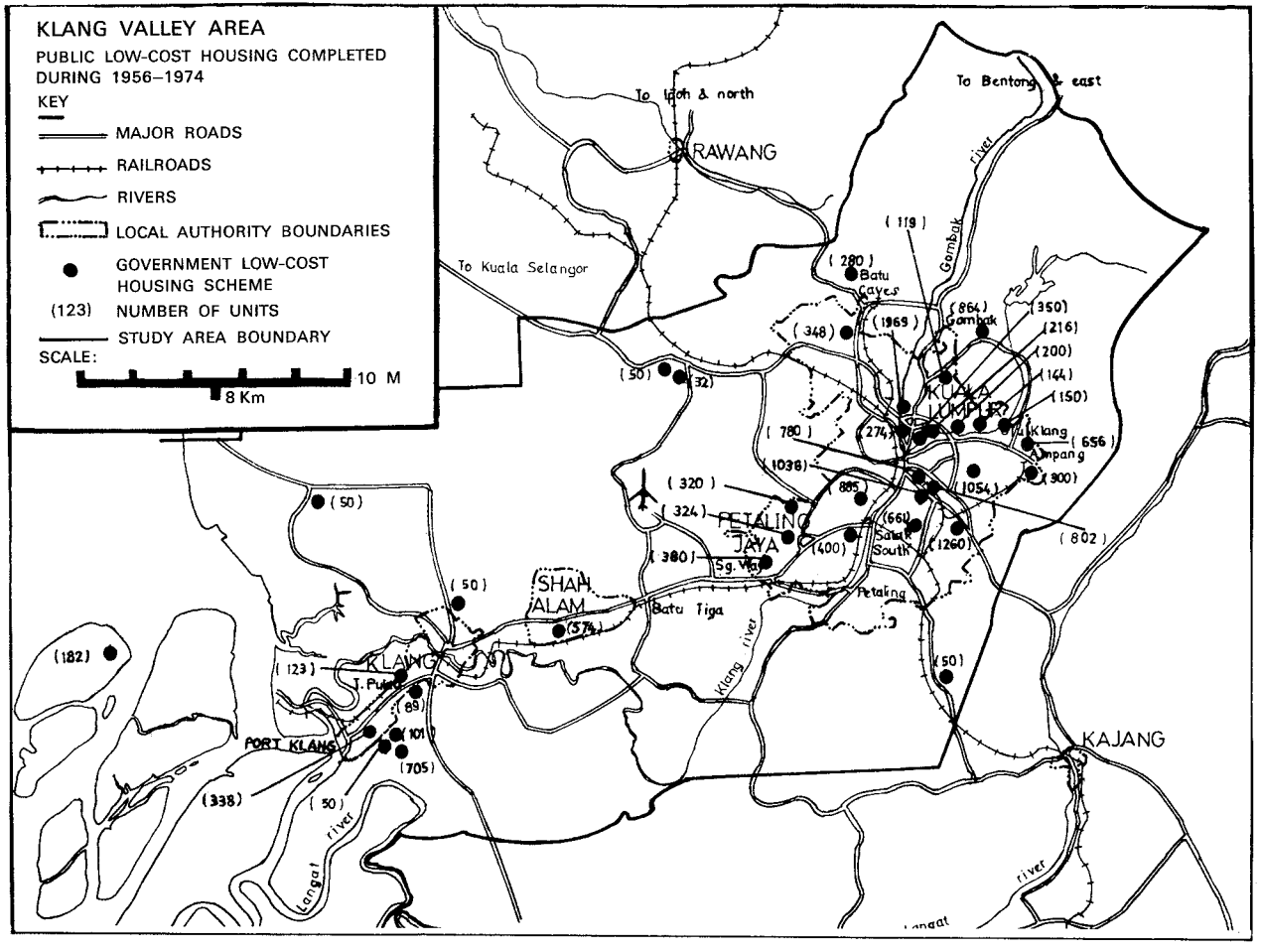
As noted in section 3.4.1 a substantial number of urban low-income households in Peninsular Malaysia are squatter households, parti-

cularly in the Port Kelang-Kuala Lumpur conurbation (the Kelang Valley area) and, next to flood victims, squatters are the prime official target group of the public low-cost housing programme. This programme consists only of provision of conventional subsidized housing schemes.[65] In addition to that a number of site-and-service schemes have been provided to resettle squatters (section 3.3.7). Upgrading of existing squatter areas as a policy option to improve housing conditions of squatters has not been applied until recently.

Approximately one-third of total public low-cost housing constructed in Peninsular Malaysia during 1956–1974 has been built in the Kelang Valley area. During the SMP period this share even came close to 60%. Within the Kelang Valley area most low-cost housing schemes have been constructed in greater Kuala Lumpur, while a secondary concentration is located in the Kelang-Port Kelang area (map 3). Thus the low-cost housing programme has been largely carried out in those areas where it was most needed. Yet it has not succeeded in reducing the extent of squatting: the squatter population in municipal Kuala Lumpur alone increased from an estimated number of 26,500 households in 1968 to 29,000 in 1973 (section 3.4.1). Only approximately 3,850 out of the 8,500 units of low-cost housing provided in greater Kuala Lumpur during that period have eventually been occupied by rehoused squatters, and as noted in section 3.3.7 above, 60% of the 3,950 site-and-services lots provided were still vacant in mid-1973. Even if the joint public low-cost housing and site-and-services effort during 1968–1973 had been utilized entirely to rehouse squatters from municipal Kuala Lumpur, the number of squatter households in that area would still have been around 22,000 in 1973.

In other words, the joint rehousing programme has been quanti-

65. Common elements of subsidy are: generous terms of finance, reflected in below-market interest rates and longer repayment periods than is common for commercial loans; nominal premium for land supplied by state governments (and sometimes absorption of infrastructure costs by the state government); in case of federally funded housing schemes, the technical services of the housing trust are not charged as costs to the project.


KLANG VALLEY AREA
PUBLIC LOW-COST HOUSING COMPLETED DURING 1956–1974
KEY
MAJOR ROADS
RAILROADS
RIVERS
LOCAL AUTHORITY BOUNDARIES
GOVERNMENT LOW-COST HOUSING SCHEME
(123) NUMBER OF UNITS
STUDY AREA BOUNDARY
SCALE:
8 Km
10 M
To Ipoh & north
To Kuala Selangor
To Bentong & east
RAWANG
Batu Caves
Gombak
Gombak River
KUALA LUMPUR
Klang
Ampang
PETALING JAYA
Sg. Way
Salak South
Petaling
Batu Tiga
SHAH ALAM
KLANG
J. Puteri
PORT KLANG
Klang river
Langat river
KAJANG
(280)
(119)
(348)
(1969)
(864)
(350)
(216)
(200)
(144)
(150)
(656)
(900)
(1054)
(802)
(1260)
(1038)
(885)
(780)
(274)
(320)
(324)
(660)
(400)
(380)
(50)
(32)
(57)
(182)
(123)
(89)
(101)
(705)
(338)

Map 3

tatively inadequate to contribute much to a solution of the squatter problem and neither the low-cost housing units nor the resettlement schemes were apparently very popular.

It is virtually impossible to solve the squatter problem through convential housing programmes, except at vastly increased costs, not only in terms of investment required, but also in terms of subsidies. There are two major reasons for this: the phenomenon of rural-urban migration and the low income level of squatter households compared with rents, instalments and other housing payments related to the present programme.

Rural-urban migration has been particularly relevant to the Kelang Valley area (section 2.3.3). Including the Federal Capital with its government services nucleus, a major port and a large number of industrial areas, it forms a strong attraction to potential migrants. Since many of the newly arriving migrants are initially poor[66] (average rural household income is about half the average urban household income in Peninsular Malaysia, table 2.12), they have little alternative but to use their scanty resources as economically as possible, and easily resort to squatting, since this in many instances would be the cheapest way to obtain shelter.[67]

This problem is aggravated by the fact that the government has embarked on a number of programmes to increase the Malay share in the modern sectors of the economy in order to further the second objective of the New Economic Policy, i.e. to restructure society

66. This is also illustrated by the income data in table 3.8, indicating that nominal income levels of squatters in 1973 were only marginally higher than in 1966/68. This implies that squatters as a group have experienced a decline in real incomes, especially during 1972/73, when price increases began to accelerate. For individual households this was not the case: the nearly 400 squatter households for whom comprehensive income data have been collected for the period 1970–1973 (see section 4.3.2 below) recorded an average annual increase in nominal household income of 10.6% during this period. This leads to the hypothesis that new additions to the squatter population (mainly Malay rural migrants) are generally much poorer than those who have already been squatting for a number of years.

67. However, this should not be interpreted to mean that *all* migrants arriving in the Kelang Valley area will settle in squatter areas immediately upon arrival. The available evidence suggests that the pattern is much more diverse: many migrants initially stay with relatives or friends (some of whom may live in squatter areas), their families joining them at a later stage, or, if unmarried, household formation will take place only later. Thus, many migrants will only enter the low-income housing market after having lived in the

as a vehicle to achieve national unity (see section 2.6.2). Since the modern sectors of the economy (manufacturing, trading and other services) are mainly urban-based, these programmes imply accelerated urbanization of the predominantly rural Malay population, thereby stimulating migration from rural areas to existing urban centres. It cannot be assessed to what extent government policy has actually influenced migration streams, but comparison of the 1966/1968 data and the 1973 data on squatter households showed that the percentage of Malay households out of all squatter households had increased from 20.6% to 25.3% (section 3.4.2) between these years. Obviously there is a conflict between policies that stimulate rural-urban migration and policies that seek to solve the urban squatter problem by rehousing and resettling.

Low income levels of squatter households mean that for many squatters the present public low-cost housing programme is beyond their reach at current rent levels. This can be seen by comparing rents squatters generally pay in squatter areas and rents charged by Kuala Lumpur Municipality and Selangor State Development Corporation (P.K.N.S.), for their subsidized low-cost flats. As noted in table 3.9, nearly 90% of those squatter households interviewed in 1973 who were renting their houses, paid rents between M$ 10 and M$40. The mean rean paid was M$26 per month (12% of mean income).

Table 3.13 provides some information on rents charged by the authorities mentioned above. If it is assumed that 20% of household income is the maximum amount available for housing, it follows that 3 and 4-roomed flats are beyond the means of at least 50% of squatter households.[68] Moreover, living in public low-cost housing means also fulfilling rather rigid commitments towards payment of

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Footnote 67 (continued)

Kelang Valley area for some time. On the other hand, some migrants may never need to resort to squatting to fulfil their housing needs, while others may have no other option. See Narayanan (1976), particularly chapters III and VI, for a highly informative survey of characteristics of immigrants in Metropolitan Urban Selangor (Kuala Lumpur, Petaling Jaya and Kelang).

68. Data ōn household expenditure of nearly 400 squatter households which have been rehoused into government low-cost housing schemes show that an average of 17.0% of

TABLE 3.13. Monthly rentals for public low-cost flats (in M$)

	P.K.N.S.		Kuala Lumpur Municipality	
Size[a]	Amount	As % of median monthly squatter household income (1973)	Amount	As % of median monthly squatter household income (1973)
1 room	$20	10.6	$32	17.0
2 rooms	$35	18.5	$42 ($36)[b]	22.2 (19.0)
3 rooms	$55	29.1	$55 ($47)[b]	29.1 (24.9)
4 rooms	—	—	$68	36.0

[a]including living room;
[b]outskirts of town

deposits, both for the house and for water and electricity in addition to paying monthly bills for these amenities.[69]

For those public low-cost houses that are sold to squatters on a hire-purchase basis, monthly instalments range from M$30 to M$100 and an additional problem is posed by the requirement of making a down-payment generally ranging from M$250 to as much as M$2,000. Concerning the squatter resettlement schemes in greater Kuala Lumpur area, annual rents for a standard housing lot of 50 ft × 80 ft are approximately M$15. On these lots the resettled squatters have to erect their houses themselves or commission a

Footnote 68 (continued)
monthly household income is spent on regular payments to the house (rent or instalment plus water and electricity). Preliminary data from the Household Income and Expenditure Survey 1973 indicate that for all households in Peninsular Malaysia this figure is 14.8% (including fuel); in the household income bracket below M$300 monthly, 15.9%.

69. In order to alleviate such financial problems somewhat, and to assist rehoused households in getting used to all those commitments slowly, the Municipality has extended the following extra subsidies to rehoused squatter households:
—removal costs are paid for by the Municipality.
—after moving into the housing estate rehoused households are not required to pay any rent during the first three months of their tenancy.
—during the ensuing twenty-one months they have to pay only 50% of the rent.
In case of rental schemes built by P.K.N.S., during the first two months of occupancy no rents are collected.

contractor to do so. Either way considerable capital outlays are required, either for purchase of materials or progress payment to the contractor. To reduce this problem, the government has provided building materials loans. Under this scheme however a down-payment of M$350 is required. The purchaser has to prepare the site and build the bouse himself assisted by paid construction labour. In addition to this, the fact that all schemes are rather far from Kuala Lumpur means that resettled households have to pay considerable sums for transport to work, school, hospitals, etc. (see section 3.3.7).

The gap between rents and instalments and ability to pay for housing is likely to increase further with increasing scarcity of suitable state land for housing and increases in construction costs (both of which were particularly relevant during the building boom in 1972–1974) unless squatter household incomes rise by a sufficient amount or these price increases are absorbed by the government, implying further subsidies.

Summarizing, public low-cost housing units mean a substantial improvement in housing conditions for rehoused squatters, perhaps not so much in terms of space, but certainly in terms of security of tenure, availability of piped water, electricity, flush toilet and sewerage facilities, as well as general cleanliness of the house (for further details see sections 3.4.3 and 4.3.3). This applies also, but to a much lesser extent, to the site-and-services schemes, in which many planned improvements did not, in fact, materialize (section 3.3.7).

In view of this the apparent lack of popularity of present rehousing and resettling programmes seems a bit puzzling. Financial problems must have been a cause of the low percentage of ex-squatters in public low-cost housing schemes and the high vacancy rate in the site-and-services projects. In addition to that, for some schemes this has been compounded by specific features of the scheme concerned: poor location, lack of certain facilities, prejudices against living in high-rise flats, etc.

Yet probably the most important cause is the problem of access. In the case of public low-cost housing a substantial number of units produced have simply not been offered to squatters but have been

allocated instead to police and army personnel for security reasons. In addition to that, eligibility criteria may not have been adhered to strictly in individual cases (in some cases non-eligible applicants secured low-cost housing units through intervention on their behalf by prominent politicians). As to the site-and-services effort, administrative bottle-necks in processing applications were obvious. Clearly, all this restricts access to low-income housing for the target groups.

4. Evaluation of squatter rehousing

4.1. COST-BENEFIT ANALYSIS (CBA) OF SQUATTER REHOUSING

The previous section showed that present squatter rehousing and resettling programmes are deficient in a number of aspects. Although these programmes improve housing conditions of the beneficiaries substantially, their quantitative impact is limited. In view of rural-urban migration and the rent-income gap, no effective contribution has been made to the solution of the squatter problem. This would require a substantial increase in investment in urban low-income housing, which would mean that investments in other sectors would have to be postponed or curtailed. This presents a problem of choice in overall resource allocation.

Within the low-income housing sector a similar problem arises: the choice between various possible options to improve housing conditions of urban low-income households, implying various levels of improvement, each having its attendant costs and benefits. As indicated, there are broadly three (not necessarily mutually exclusive) lines of approach:

—conventional housing;
—sites and services;
—upgrading.

In order to assess the desirability of low-income housing investment vis-à-vis other investments, it should be determined to what extent investments in various sectors contribute to the achievement of the aims of the Malaysian development strategy, the New Economic Policy (NEP).[1] In principle this can be carried out by subjecting

1. This implies that resource allocation (and therefore project appraisal) is used as an instrument to achieve government objectives is addition to the more traditional instru-

all potential investment projects to a cost-benefit appraisal, using in each case the same pre-determined set of national parameters, such as the relative weight of all NEP objectives, the social discount rate (SDR) and shadow-prices (for an elaboration of these concepts, see appendix A, section 3). This could simultaneously solve the choice problem within the low-income housing sector. Unfortunately the institutional prerequisites for such a procedure are hardly attainable in practice in many of the developing countries. A central government planning agency is required which is capable and powerful enough to develop an unambiguous set of national parameters in a continuous iterative dialogue with the central decision makers. It also needs to co-ordinate and stimulate a planning process in which all conceivable investment project proposals are drawn up and consistently evaluated with the aid of this set of national parameters. This process in turn serves as a feedback in the dialogue with the central policy maker.[2]

In Malaysia much of the necessary government machinery for such a planning procedure is available. The major government agency responsible for development planning is the Economic Planning Unit (EPU) in the Prime Minister's department. The EPU is responsible to the National Development Planning Committee (NDPC), comprising the civil service heads of all major economic development ministries under the chairmanship of the Chief Secretary to the government. The NDPC in turn reports to the National Economic Council (NEC) – a committee of the Federal Cabinet under the chairmanship of the Prime Minister. The task of monitoring progress lies with the Implementation and Co-ordination Unit (ICU) in the Prime Minister's department, responsible to the National Action Council (NAC), chaired by the Prime Minister. Arrangements at the state and district level are similar to those at the Federal level.

Footnote 1 (continued)
ments of monetary and fiscal policy, which realistically reflects the Malaysian government's approach to the redistributive aspects of the NEP.

2. For an elaboration of those points see UNIDO (1972, pp. 117–153) and Little and Mirrlees (1974, pp. 83–113).

In the course of preparation of the TMP an attempt has been made to initiate a planning procedure similar to that outlined above. However, this was an ad hoc exercise and by and large was limited to public sector projects. Moreover, there was no explicit guidance from the political leadership as to the magnitude of national parameters, notably regarding the relative weights of the NEP objectives. While this is understandable from the politician's point of view it has led to confusion and inconsistent interpretation of these magnitudes by the agencies formulating and appraising project proposals.

Another problem in formulating and appraising potential investment projects is the inherent element of uncertainty, especially if the agency concerned has little experience with the particular type of project. Often construction costs are underestimated, problems of maintenance are sometimes inadequately accounted for, while potential benefits are often judged too optimistically. In addition to that, benefits of a rather speculative, intangible nature are sometimes included to support an otherwise weak project.

In view of such constraints, how should it be determined, if and to what extent the government should embark on an increase in investment in low-income housing, and what mixture of approaches should be used? Obviously, an analysis in terms of housing needs and achievement of improved housing conditions points to substantial increases, but this leaves out of account that similar arguments could well be raised for other investments too.

What can be done is to evaluate, with the benefit of hindsight, to what extent the present squatter rehousing programme has contributed to the achievement of the NEP aims. This will give at least some guidance to investment decision making in future.

For that purpose a detailed evaluation of six low-cost squatter rehousing schemes constructed in the Kelang Valley area during 1968–1971 is presented in this study. The fact that this analysis will be to a large extent ex-post eliminates many uncertainties that would otherwise be present in project appraisal. By studying the six projects in depth it is also possible to pin-point the elements that have been crucial to the success or failure of each scheme, which

may present some guidelines as to the contents of future low-income housing programmes. This will be facilitated by the fact that all types of conventional low-cost housing approaches are included in the case-study analysis (regrettably, lack of data precluded inclusion of any of the site-and-services schemes, see section 4.3.1).

4.2. METHODOLOGICAL ASPECTS

4.2.1. The UNIDO approach to CBA

The CBA framework employed in this study draws primarily on the CBA approach developed by Dasgupta, Sen and Marglin in their *Guidelines for Project Evaluation*, prepared for UNIDO in 1972 (see also Hansen, 1973). This approach is quite similar to the better-known Little-Mirrlees approach to CBA, differences being caused by differences in underlying assumptions and in emphasis.[3] Both methods are now generally regarded as mutually consistent and are used as a basis to modify current project appraisal practices of international aid donors such as the World Bank (Squire and van der Tak, 1975, p. 3). The adoption of this appraisal technique by such international institutions will be a stimulus for its systematic use in aid-receiving countries, which could enhance consistency in investment decision-making in these countries.

In appendix A a survey is provided of the concept of and rationale for CBA, its relation to policy objectives, its framework and how costs and benefits are measured using the UNIDO approach, as well as some specific problems inherent in the use of CBA. The Comprehensive UNIDO/Little-Mirrlees approach is also briefly compared with alternative methods of project appraisal proposed.

The UNIDO method is used in this study because it differs in several important aspects from the more traditional applications

3. Little and Mirrlees (1968 and 1974). A discussion of the differences between the two approaches is provided in Dasgupta (1972a and 1972b). Little and Mirrlees (1974, pp. 358–363), Hansen (1973, annex A), and Lal (1974).

of CBA:

—it incorporates a systematic and consistent procedure of shadow-price estimation and application;
—it deals explicitly with the question of how a project's contribution to the multiplicity of government aims can be incorporated in CBA, notably regarding the income redistributional impact of a project;
—considerable attention is given to the institutional planning framework that is required to apply CBA with these characteristics, notably to determine national parameters (see section 4.1).

4.2.2. Cost and benefit items to be included in the case-study analysis

The nature of the project to be analysed and the policy aims to the achievement of which the project is to contribute largely determine the kind of cost and benefit categories relevant to the analysis. The present approach to urban low-income housing, insofar as it is directed at squatters, consists of the following components:

—provision of new housing (conventional units or site-and-service plots);
—relocation of squatters into new housing;
—demolition of squatter housing in the old area.

In view of this practice these three elements combined are viewed as one activity in this study. Costs and benefits therefore will be related to the project activity thus defined.

The policy aims of the NEP as outlined in sections 2.6.2 and 2.6.3 broadly include the following:

—a rapid rise in the level of aggregate income and employment;
—redistribution of ownership of productive assets among Malay, non-Malay and foreign interests in such a way that Malays will own 30% of the sum total by 1990;
—redistribution of the employment structure in such a way that it

will reflect the racial composition of the country's population in all sectors and at all occupational levels;
—reduction in the existing interpersonal and inter-ethnic income disparities.

Obviously, the above aims are to a considerable extent complementary in nature, which means that to take them all into account in a CBA would greatly enhance the chance of double-counting costs or benefits (see also appendix A, section 3). Aggregate income and employment growth are strongly interrelated; increased incomes and savings are viewed by the government as a precondition to redistribution of aggregate wealth, since expropriation and handouts of existing wealth from one group to another are not intended (compare sections 2.6.2 and 5.1).

To minimize possible double-counting it is assumed that the NEP aims are adequately reflected in the formal CBA by focussing on increases in aggregate income (and therefore consumption) and its interpersonal and inter-ethnic distribution. So aggregate consumption costs and benefits are taken into account as well as redistributional ones. Identification of redistributional target groups and estimates of the relative weight of each aim are discussed in chapter 5. The project's contribution to the other, largely complementary aims, such as aggregate employment, inter-ethnic redistribution of wealth and employment will be discussed briefly (6.3.1), but not taken into account in the estimates of net present value or internal rate of return. This also applies to possible changes in inter-ethnic attitudes in those cases where squatters from ethnically homogeneous squatter areas are rehoused in multi-racial housing schemes (6.3.2). Such changes may be extremely important in the context of the NEP attempt to achieve national unity, but obviously cannot be included in any net present value or rate of return calculation.

The possibility of double-counting can be further reduced by limiting the number of cost and benefit items included. However, prior to study, inclusion or exclusion of certain aspects is somewhat arbitrary: different people would use different 'cut-off points' in deciding which cost and benefit items are too insignificant to include

(in the sense that inclusion or exclusion makes little difference to the outcome of the analysis).

In view of the above considerations, the following cost and benefit items have been selected from an inventory listing of potentially relevant aspects that have been identified in the literature (see Wegelin, 1975, pp. 31–35).

I. *Aggregate consumption costs and benefits (Appendix A 5.1)*

Costs

A. Construction costs of housing schemes, including site acquisition and improvement, construction of structure (building costs) and infrastructure (drains, roads, etc.) as well as administrative overheads.
B. Operating costs (maintenance, repair and overheads).
C. Costs of squatter relocation, consisting of demolition costs of squatter structures (including the estimated value of structures demolished) and households' removal costs.

Benefits

A. Welfare benefits of improved housing to the rehoused squatters as determined by their (potential) willingness to pay for the housing services. This not only includes the direct appreciation for an improved housing environment, but it is assumed that also the more indirect welfare impacts on the rehoused households of such an improvement are reflected in the willingness to pay. These indirect impacts include a number of social aspects, which very often are casually viewed as additional costs or benefits of improved housing, whereas very little research has actually been carried out to verify the existence and the magnitude of such claims (see section 3.1 and appendix B). In spite of the fact that the appreciation of these indirect impacts is assumed to be included in the consumers' willingness to pay for improved housing, it has been attempted to estimate if and to what extent the following changes actually were of relevance to the housing schemes

studied (see appendix B):
—changes in health of rehoused households;
—changes in fire incidence related to the improved housing environment;
—changes in crime rates caused by the change in housing environment;
—changes in travelling time and transport costs after rehousing (section 4.3.3.1);
—changes in productivity at work and school performance after rehousing of working and studying household-members respectively.

The study of these aspects serves two purposes: firstly to quantity the importance of these impacts in a number of concrete case-studies (insofar as the limited data allow), secondly to estimate the possible 'spill-over' effects some of these impacts may have on public savings (B) or on society at large, giving rise to possible external costs or benefits (C).

B. Additional aggregate consumption benefits accruing to the investor (the government):
—appreciation of land values at the cleared site and adjacent areas (insofar as public land is concerned) reflecting enhanced development potential following squatter clearance;
—'spill-over' effects from the indirect welfare impacts mentioned under A, notably public savings due to reduced needs of utilization of health care, fire prevention and transport facilities, public savings caused by changes in efficiency of education as a result of changes in school performance of rehoused pupils.

C. External costs or benefits (non-priced costs or benefits accruing to groups other than the project's direct beneficiaries – the government or the occupants; see appendix A 5.2):
—increase in land values of cleared squatter sites and adjacent areas (both in case of private ownership only) due to greater development potential as a result of clearance;
—'spill-over' effects from the indirect welfare impacts men-

tioned under (A), notably private (non-occupants') savings due to reduced needs of utilization of health care facilities (important in case of employer-paid health care). In addition, benefits of increased productivity of workers insofar as they are not included in (A) because they do not accrue to the workers in the form of higher earnings, but are retained by the employer concerned.

II. *Costs and benefits related to the aim of redistributing income among ethnic groups and income strata (Appendix A 5.3).*

Since this aim is a distributional one, costs and benefits are simply net aggregate consumption cost and benefits incurred by or accruing to the target group(s). The redistributional benefits to any group are equal to their immediate aggregate consumption benefits received minus any offsetting payments made to other groups, and the redistributional costs to the group are equal to the immediate aggregate consumption costs incurred by it minus any compensating receipts from any other groups. This category of costs and benefits therefore implies that those who gain and those who lose from the project have to be identified along ethnic lines and income strata and that the gains and losses be calculated accordingly. These will differ for each project, depending among other things on the ethnic composition of the rehoused squatter group, its income distribution and their tenancy conditions.

4.2.3. Test-control study

In order to assess a number of the above cost and benefit items, as well as to obtain information on less tangible aspects such as appreciation of changing housing environments by squatters and rehoused squatters, and inter-ethnic attitudinal changes caused by rehousing, it is necessary to obtain detailed information from both rehoused and non-rehoused squatter households.

To estimate costs of squatter relocation and welfare benefits to rehoused households, information is needed from rehoused households only, whereas to obtain data on the appreciation of housing

environments and attitudinal changes, as well as to assess savings in medical services, changes in productivity, in returns on educational investments, and in travelling time and transport costs, a comparison is required between rehoused households and non-rehoused households.

In such a comparison, the aim is to measure, with the aid of information on individual persons, whether a change has taken place due to relocation. In order to measure this properly all other possible influences on the particular variable studied should be controlled so that the change measured can be attributed solely to rehousing. Obviously this will never be fully achieved, but by conducting a 'before-after', test-control study[4] the ideal situation may be approached. The essence of the experiment is described below:

> A group of people (test group) is subjected to change, in this case rehousing. Their change in performance related to a certain factor, say, attendance at work, due to the housing change is the unknown variable. To measure this, a second group of people must be identified *similar to the first group in all respects except for the change in housing* (control group). If:
>
> A_0^t = average attendance performance during year before rehousing of members of test group in number of days;
>
> A_0^c = average attendance performance during year before rehousing of members of control group in number of days;
>
> A_1^t = average attendance performance of members of test group during first year after rehousing in number of days;
>
> A_1^c = average attendance performance of members of con-

4. See Selltitz et al. (1959, pp. 94–122), for a thorough discussion of the merits of such and similar comparisons.

trol group during first year after rehousing in number of days,

the average change per person attributable to rehousing in the first year is given by:

$$A_1^t - A_0^t - (A_1^c - A_0^c) = A_1^t - A_1^c - (A_0^t - A_0^c),$$

being the difference in performance level between members of both groups in the first year after rehousing less the difference in the year previous to rehousing. Similar observations on differences in levels can be made for ensuing years.

In the present case-study the groups mentioned above are not readily available, but a universe of relocated households (occupants of the projects) and a universe of non-relocated households living at or close to the site where the relocated households lived prior to rehousing are available though. The second universe can be taken as being broadly similar to the first. In order to form two groups that are similar in all relevant aspects prior to rehousing of the rehoused households, samples from both universes have to be taken.

By means of matching individual households out of both universes these groups can be formed in such a way that factors unrelated to the change in housing, which could possibly account for differences in performance between the groups, are controlled. Therefore, the two groups can then have been considered similar prior to rehousing. Any differences in initial performance level can be attributed only to chance (or to overlooked factors).

Ideally levels of both groups should be observed continuously during the study period, ranging from several years prior to rehousing to a number of years after. However, in many cases (and the present study is no exception) time and money constraints prevent such ideal observations and only an ex-post, test-control comparison can be made. This means that the assumption that levels of both groups were similar prior to rehousing cannot be checked. In the present study this is the approach regarding inter-ethnic attitudinal

changes and appreciation of housing environments, whereas for other aspects it is possible to simulate a before-after, test-control comparison, using available records covering the study period.

4.3. THE CASE-STUDY REHOUSING SCHEMES

4.3.1. Selection and description of case-studies

As noted in section 3.4.4, a substantial number of public low-cost housing schemes and squatter resettlement site-and-services projects have been launched in the Kelang Valley Area during 1956–1974. Obviously not all these projects are equally suitable to serve as case-studies in the present study. The following requirements have been adhered to as much as possible in the selection of schemes:

A. The selected schemes should feature sufficient qualitative improvement in housing conditions over existing squatter areas for one to reasonably expect that improvement in these conditions are perceived as such by the occupants and have an impact on factors such as health, productivity, fire incidences, etc.;
B. Preferably the set of case-studies should be chosen in such a way that:
   —rehousing of squatters of all three major ethnic groups are incorporated, implying among other things that the impact of rehousing Malay and non-Malay squatters on the inter-racial distribution of income can be studied; and
   —all the various attempted ways of rehousing squatters are represented (notably resettlement schemes, terraced housing, four-storey walk-up flats and high-rise, high-density flats);
C. Squatter households originating from one or more clearly identifiable squatter areas should have been rehoused in the scheme in groups of sufficiently large size to make it worthwhile to study these groups in depth. This is particularly likely if the selected schemes have been used explicitly for squatter rehousing.
D. The squatter areas from which rehoused households originate should not have been cleared completely; or, alternatively, a

sizeable squatter settlement should still be existing near the area from where the rehoused households originated. If conditions (C) and (D) are satisfied, this means that two groups of people can be identified in principle, viz: rehoused squatters and non-rehoused squatters that are similar in all respects except for the change in housing;

E. Allocation of housing units must have taken place in such a way that no self-selection by the occupants has been possible which could damage similarity of test and control groups (this, of course, is no problem in those cases where part of a squatter area is required by the government for development purposes, meaning that those squatters who live on the part required are offered alternative accommodation, while those who live in the remaining part are not);

F. In order to measure change in labour productivity, workers of both test and control groups should preferably be employed in a type of work in which the worker can influence the speed of production, the employer paying time and incentive wages;

G. Households in test and control groups should have equally easy access to medical and schooling facilities;

H. In order to assess the changes in attitude towards other racial groups as a consequence of integrated rehousing, the project should preferably be multi-racially occupied, the control groups however comprising of people of one race only;

More pragmatic considerations are involved in the following restrictions:

I. It should be possible to analyse relevant data concerning both groups, ranging in time from several years before relocation till a number of years after. Therefore the selected schemes should have been completed in the time interval 1968–1971. Projects completed after 1971 would not provide an opportunity to analyse post-rehousing data for a sufficiently long period, while for projects completed before 1968, the necessary data might not be available (it should be noted that the actual case-study

selection was carried out in early 1973 and subsequent data collection during the remainder of 1973 and the first three quarters of 1974);

J. To limit costs and time necessary, all projects studied should be situated in the Kelang Valley area, within easy reach from UDA premises, from where data collection activities would be co-ordinated.

K. The selected schemes should be of sufficient magnitude to generate perceptible change and to enable a matching procedure to identify members of test and control groups. Arbitrarily, projects having less than 150 units have been excluded.

Eighteen public low-cost housing schemes were selected by applying requirements I to K only. In addition, information regarding the squatter resettlement (site-and-services) schemes showed that seven of these schemes would qualify according to these requirements. Discussions were held regarding all the twenty-five schemes with the authorities responsible for them (P.K.N.S., Kuala Lumpur Municipality and Kuala Lumpur District Office) to find out to what extent they satisfied the remaining requirements. This showed that nine public low-cost housing schemes could not satisfy essential requirements C and D. The seven squatter resettlement schemes did not satisfy essential conditions A, C and D, which regrettably meant that the case-study analysis had to be limited to conventional schemes. Visits to all remaining nine schemes and application of a points system with reference to the remaining requirements led to a final selection of six schemes.

A brief description of each scheme selected and its control area(s) is provided in table 4.1; their geographical location is shown in Map 4 and a visual impression of the housing schemes and the squatter areas used as control areas can be obtained from the photographs between 136 and 137. Of course, the selected schemes do not satisfy *all* requirements completely. Notably requirement F could only be satisfied in one case (*B*), where a large proportion of the occupants are cargo-handling labourers in Port Kelang Authority (LPK), which pays time and incentive wages.

TABLE 4.1. Selected public low-cost housing schemes

	Name of Scheme (and Authority in Charge)	Type of Scheme, Type and Number of Units, (Date of Completion)	Location of Control Group Areas	Racial Composition	Remarks
(*A*)	Pandamaran Jaya Phase I (P.K.N.S.)	Terrace houses, 436 two-bedroom units (April 1969)	Jln. Goh Hock Guat and Jln. Nona, Kelang; Kg. Sg. Keladi, Kg. Sg. Sireh, Kg. Sg. Aur, Kg. Mesjid, Jln. Berembang, and Jln. Camp, all in Pt. Kelang.	Mixed	Many rehoused squatters originate from Kg. Tengah, close to Jalan Goh Hock Guat and Jalan Nona
(*B*)	Pandamaran Jaya Phase II (P.K.N.S.)	Terrace houses, 329 two-bedroom units and 18 units single-storey shophouses (December 1971)	Kg. Sg. Keladi, Kg. Miskin, Jln. Berembang, Kg. Sg. Aur, Kg. Sg. Sireh, Kg. Mesjid, Jln. Camp, Jln. Samy, Jln. Sekolah (All areas Port Kelang)	Mixed	A large number of occupants have been rehoused from the Quarantine Camp, Port Kelang, adjacent to Kg. Miskin and close to Jln. Camp, Kg. Sungei Aur. Housing conditions in the Camp were worse than in most squatter areas

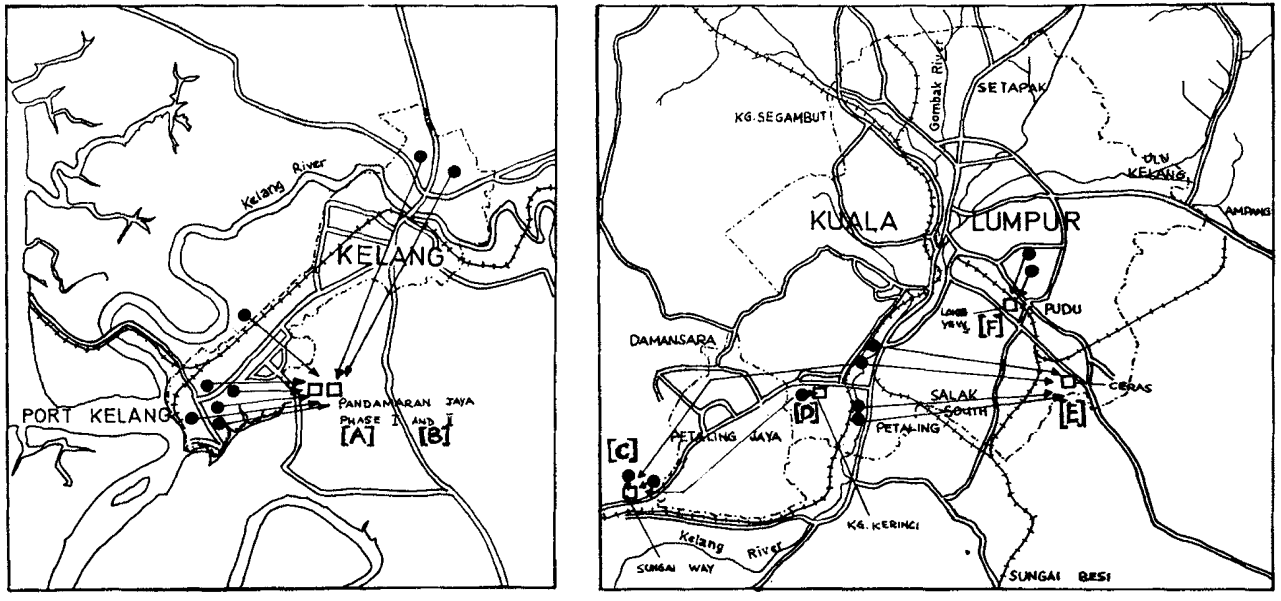
TABLE 4.1. (continued)

	Name of Scheme (and Authority in Charge)	Type of Scheme, Type and Number of Units, (Date of Completion)	Location of Control Group Areas	Racial Composition	Remarks
(*C*)	Sungei Way Phase II (P.K.N.S.)	Terrace houses, 266 two-bedroom units (April 1970)	Sg. Way New Village; Kg. Kerinichi; Kg. Pantai Dalam, Kg. Pantai Halt and Kg. Paya, Jln. Bangsar	Mixed	This scheme has not been explicitly used to rehouse squatters. The majority of the occupants came from Sungei Way New Village where housing conditions are somewhat better and income levels slightly higher than in squatter areas.
(*D*)	Kampong Kerinchi Phase I (P.K.N.S.)	4 blocks of 4-storey flats, 176 units of 1 and 2 rooms (December 1971)	Kampong Kerinchi, Bukit 'A'	Malays only	Squatters have been rehoused on the spot

	Name of Scheme (and Authority in Charge)	Type of Scheme, Type and Number of Units, (Date of Completion)	Location of Control Group Areas	Racial Composition	Remarks
(*E*)	Jalan Cheras Phase II_A (Kuala Lumpur City Hall)	4 blocks of 4-storey flats, 329 units of 2 and 3 rooms (1st half 1971)	Kg. Hj. Abdullah Hukum, Kg. Paya and Kg. Padang, all along Jln. Bangsar; Kg. Pantai Dalam, Kg. Toddy, Sentul	Mixed	A large number of occupants are rehoused squatters from the control areas who were rendered homeless in the 1971 floods. Later, it appeared that no suitable control group was available in Kg. Toddy, Sentul, so even though the housing scheme is racially mixed, the test and control groups consists solely of Malays

TABLE 4.1. (continued)

	Name of Scheme (and Authority in Charge)	Type of Scheme, Type and Number of Units, (Date of Completion)	Location of Control Group Areas	Racial Composition	Remarks
(*F*)	Jalan Loke Yew Phase IV (Kuala Lumpur City Hall)	1 block of 20-storey flats, 400 units, 2, 3 and 4 rooms (June 1971)	Jalan Imbi, Jalan Bukit Bintang	Mixed	Rehoused squatters in this scheme are mainly Chinese from Lorong Bukit Bintang and Jalan Walter Grenier areas (in the vicinity of the control areas). Racial mix in the scheme has been brought about by allocating 100 units to the army and 70 units to the police (Both are Malay dominated).



KLANG VALLEY AREA
SELECTED CASE STUDIES

KEY

- MAJOR ROADS
- RAILROADS
- RIVERS
- LOCAL AUTHORITY BOUNDARIES
- CONTROL GROUP AREA
- HOUSING SCHEME (TEST GROUP)

Map 4

One scheme (*C*) has been included that has not been used explicitly for squatter rehousing. However, adequate possibilities of forming a control group were available, since most of the occupants shifted from overcrowded housing conditions in nearby Sungei Way New Village. The fact that no explicit squatter clearance is related to this scheme implies that certain cost and benefit items, such as costs of relocating squatters and the effects of clearance on land values, must be imputed for this scheme based on the findings for the five other schemes. This applies also to some extent to project (*E*), where the rehoused test group consists solely of Malay squatters who lost their homes in the 1971 floods. Naturally no resources were used in demolishing their huts, neither was the area where they lived before rehousing (river reserve) wanted for development purposes. Therefore regarding this area no change in land values is anticipated. However, the same project has been used to rehouse squatters from some areas that have been cleared completely by the government. For these areas changes in land values have been taken into account, but these rehoused households could not be included in the test group for lack of a control group in the cleared areas.

In one case (*D*) the requirement of multi-raciality is not satisfied. In this scheme Malay squatters have been rehoused on the spot. Since this scheme is otherwise near ideal to study rehousing and because in all other schemes occupants are multi-racial, it has been included nevertheless.

4.3.2. Data collection

Most cost data have been obtained from the two authorities in charge of the schemes, P.K.N.S. and Kuala Lumpur Municipality. However, some costs are not incurred by these authorities but are borne by the rehoused squatters themselves. This applies to items of operating costs in some schemes and particularly to relocation costs. As to the benefit side, much of the necessary information had to be obtained from the rehoused squatter households through the test-control group survey. Some of the data thus obtained then served to obtain performance data from health care institutions, employers and schools. Data on fire incidences, crime incidences and residence of offenders have been obtained from Kuala Lumpur

Fig. 1. Kampong Sungei Aur (control areas schemes A and B).

Fig. 2. Interior of a house in the same area. Thatched roofing badly in need of replacement.

Fig. 3. Kampong Sungei Keladi (control area schemes A and B). A Malay squatter settlement, where the residents have skillfully adapted their housing environment: the entire settlement is built above a shallow creek, which is flooded at high-tide. While Malays traditionally build their houses on stilts (see pictures 7 and 8), the elevated footpaths are a specific feature of this area.

Fig. 4. Chinese squatter area along Jalan Bukit Bintang (control area scheme F).

Fig. 5. Indian squatters, Kampong Toddy (control area scheme E).

Fig. 6. Chinese squatters, Kampong Toddy.

Fig. 7. Kampong Kerinchi (control area schemes C and D).

Fig. 8. Kampong Paya, Jalan Bangsar (control area schemes C and E). Note the large number of hoses from the standpipe, supplying water to many houses in the area.

Fig. 9. Schemes A and B. (Pandamaran Jaya).

Fig. 10. Interior of one of the houses.

Figs. 11. and *12.* Scheme C (Sungei Way). Note that the structural features are identical to those of schemes A and B (pictures 9 and 10).

Fig. 13. and *14.* Scheme D. (Kampong Kerinchi).

Fig. 15. Scheme E. (Jalan Cheras).

Fig. 16. Scheme F. (Jalan Loke Yew).

Municipal Fire Brigade, Royal Malaysian Police Force and the Kuala Lumpur Sessions Court respectively. Land data have been made available by the Kuala Lumpur and Kelang Land and District Offices and the Selangor State Planning Unit.

The in-depth test-control household survey has been utilized to obtain additional information on household incomes and expenditure, factual data on housing environments, and perception of these as well as information on inter-ethnic attitudes. Selection of test and control group households and the survey procedure used are discussed below.

A total of 397 rehoused households have been matched to the same number of non-rehoused households. A detailed account is provided in table 4.2.

Data used for matching have been obtained from compulsory housing application forms and the 1973 surveys of squatter households (section 3.4.2) respectively. Criteria for matching included similarity of housing environment prior to rehousing, a two-year minimum period of residence previous to rehousing, race, occupation of household heads, household size and structure, and monthly income, all prior to rehousing.

Test and control household surveys for the various case-studies have been carried out from July 1973 to February 1974.[5] Some non-

TABLE 4.2. Number of matched rehoused households in each case study.

Schemes	Number of households in test group	Ethnic group
A	89	All three major races
B	33	Malay and Indian
C	41	Malay and Chinese
D	80	Malay
E	112	Malay
F	42	Chinese

5. The survey questionnaire (Wegelin, 1975, appendix 3) was drafted in late May 1973, discussed and redrafted several times and pre-tested in early July 1973, after which a final redrafting took place. Questionnaires used to interview test groups are somewhat more elaborate than those used for control groups, in view of the additional information needed from them.

response problems were encountered and this necessitated rematching in some cases.

UDA junior staff have been utilized as interviewers in the in-depth surveys. This ensured a reasonable degree of involvement in the surveys on the interviewers' part and made it possible to check back with respondents in case of incomplete or inconsistent information. Interviews were mainly carried out during weekends and the remainder late in the afternoon, since it was essential that household heads be interviewed personally (in view of the fact that the questionnaire contains a number of attitudinal questions).

For each scheme test and control groups have been interviewed by the same group of interviewers, eliminating possible differences in replies between the groups caused by differences in approach of interviewers. It had also been ensured in all cases that interviewer and respondent were of the same race.

4.3.3. Changes in housing conditions with relocation

4.3.3.1. Observed physical and environmental changes

Apart from security of tenure (either renting or hire-purchase), rehousing has brought about a change in physical housing conditions in all cases from living in plank housing, often overcrowded and without basic facilities such as water, electricity and sanitation (section 3.4.3) to brick or concrete structures, where all such facilities are available internally in the housing units. As indicated in table 3.10, internal crowding has been reduced somewhat upon rehousing, but changes are not spectacular in this respect.

As to the housing environment, aspects of major importance likely to change with rehousing consist of curtilage use (growing of vegetables and fruits or rearing poultry in the household compound) and accessibility of jobs, schools, markets and shops as well as social infrastructure facilities such as places of worship, health care facilities, playing fields, cinemas etc. Accessibility is determined by distances to these places and the availability of various kinds of transport.

Contrary to expectation, curtilage use is of very limited importance

to both interviewed squatter households and rehoused households. Less than 1% of both indicated that curtilage use is a source of income to them. Average earnings from this source was M$ 14 per month for these households. As to curtilage use for own consumption, 3.8% of the rehoused households and 5.0% of non-rehoused households indicated they grow or rear foodstuff for their own use. For these households average monthly savings in household expenditure as a result of this is estimated at M$ 19.50. It can therefore be concluded that although curtilage use gives rise to significant earnings or savings to those individual households who do grow vegetables or rear poultry, the percentage of households indicating curtilage use was so low that its impact for both groups as a whole was small. Average monthly earnings from curtilage use in cash and in kind per household is M$0.80 for the test groups and M$ 1.05 for the control groups. This brings out a second observation – differences between test and control groups were found to be small. This is partly caused by the fact that rehousing into the terrace housing schemes (*A*, *B* and *C*) provides unlimited continuing curtilage use possibilities. Even in the flats a number of residents indicated that they grow vegetables on plots nearby. Poultry rearing declines with flat rehousing as expected.

However, the above data from the rehousing schemes studied appear to be rather atypical: the squatter survey 1966/68 indicates that 1.2% of squatter households derived income from curtilage use whereas curtilage use for own consumption was found for 39.1% of the squatters. (Kuala Lumpur Municipality, 1970, appendix 8, p. 3). Therefore although changes in total earnings derived from curtilage use appear to be negligible for the rehousing schemes studied, this does not warrant neglect of this aspect in planning future rehousing schemes, particularly because adverse effects could be considerable for high-rise rehousing.

Although it is desirable that squatter rehousing does not adversely affect distances to places of employment, schools and infrastructural facilities, in reality this is very seldom the case. In fact more often than not distances increase and accessibility to these essential facilities deteriorate with rehousing. Data on this are presented

TABLE 4.3. Travelling distance, time and transport costs to work (averages per working household member), 1973[a]

Residents of scheme	Distances in miles		Time needed in minutes (two ways)		Monthly amount of transport costs in M$	
	Before rehousing	After rehousing	Before rehousing	After rehousing	Before rehousing	After rehousing
A	4.4	5.7	40	51	2.32	4.03
B	2.4	10.0	27	61	3.68	4.36
C	3.3	3.8	31	34	8.56	12.14
D	–	–	–	–	–	–
E	3.7	7.7	39	66	5.31	11.82
F	3.5	4.5	31	40	8.24	10.30

[a]For scheme *D* there are no differences attributable to rehousing, which was carried out on the spot. All other differences are significant ($p < 0.05$), except for distances in case of scheme *C* (significant at $p < 0.1$) and in case of amounts for scheme *B* and time needed for scheme *C* (both not significant).

below (table 4.3) for the housing schemes studied. Distances to places of employment increased in all cases where rehousing was not carried out on the spot. This leads to either longer travelling time or higher transport costs or both, among other things depending on whether a change in mode of transport takes place with rehousing.

After rehousing 33.3% of the workers in scheme *A* made use of transport means for which daily costs have to be incurred, like buses, taxis and motor-cycles, whereas this figure was 23.8% prior to rehousing. For *B* this figure changed only from 15.4% to 15.7%, the vast majority of workers using bicycles both before and after rehousing. This is clearly reflected in data on mileage, time and costs for these schemes. In the case of scheme *E*, the percentage of those using means of transport for which regular payments have to be incurred rose dramatically from 43.4% to 76.9% after rehousing, as reflected in the amount of transport costs shown. In spite of this time needed nearly doubled after rehousing, indicating that increases in both physical and monetary transport costs are relatively high for this project.

A similar pattern is discernible for school children in rehoused households, although not to such an extent. The fact that differences shown in table 4.4 are smaller (and not always significant) than those in table 4.3 is probably partly caused by the beneficial effect of the Ministry of Education's policy to provide children of rehoused squatters a place in schools as near to their new home as possible.

In the case of scheme *B*, the percentage of pupils who make use of paid transport drops from 47.8% to 39.5% with rehousing. A shift towards the use of bicycles is clearly discerible and this is reflected in changes in travelling time.

Access to markets and other shopping facilities for daily necessities did not change markedly for any of the schemes, nor was access to lower-frequency facilities such as recreational areas affected, except in the case of scheme *E*: in this case the distance to the nearest public playing field, for example, has increased from 2.1 to 3.1 miles with rehousing. A similar situation was found concerning health care facilities. As can be seen from map 4, in the case of

TABLE 4.4. Travelling distance, time and transport costs to school (average per pupil), 1973[a]

Residents of scheme	Distances in miles		Time needed in minutes (two ways)		Monthly amount of transport costs in M$	
	Before rehousing	After rehousing	Before rehousing	After rehousing	Before rehousing	After rehousing
A	1.7	1.8	33	33	1.22	1.64
B	2.2	2.6	33	41	2.33	2.63
C	2.3	2.3	33	36	3.29	4.06
D	–	–	–	–	–	–
E	3.0	3.7	41	43	3.65	4.50
F	1.0	1.5	20	30	2.13	3.03

[a]In the case of scheme *D*, on-the-spot rehousing did not lead to any differences. Differences found for schemes *A*, *B*, and *C* are not significant, except in the case of time needed for scheme *B* ($p < 0.1$). Differences for schemes *E* and *F* are significant ($p < 0.05$), except in the case of time needed for scheme *E*, while differences in amounts for scheme *F* are significant at a lower confidence level ($p < 0.1$).

scheme *E* squatters have been relocated from the opposite side of town, explaining such access problems in this particular case.

Although, obviously a process of gradual spatial reorientation regarding employment, education and infrastructural facilities will take place, this is likely to take a long time (especially for employment – it is seldom possible for relocated workers to change their place of employment easily). For that reason accessibility considerations should play an important rôle in planning future rehousing and relocation projects.

4.3.3.2. Perceptions

The extent to which squatters perceive changes in housing conditions and environments with rehousing as improvements obviously influences their acceptance of and their willingness to pay for such changes. An insight to squatters' perceptions is also useful in the context of setting realistic minimum standards for government low-income housing. In order to obtain an impression of these perceptions the interviewed squatters have been asked whether they had any complaints or problems concerning their present housing environment. They were shown a list of eighteen specified problem areas and were asked to indicate if they had any problems. If so, the precise nature of the problem could be elaborated upon and they could add any problem not listed. The same questions have been put to the rehoused households, providing an opportunity to observe whether the improved physical housing environments are perceived as such by the households involved. The replies for both groups are provided in table 4.5.

The table shows that, in spite of the high incidence of crowding and non-availability of facilities and amenities, not all affected squatter households perceive these as problems. For example, although over 80% of the squatter households interviewed did not have electricity or piped water inside their house, only 46% and 54% respectively indicated that they saw a problem in the deficiency. Most often experienced problems are those pertaining to sewerage, rats and mosquitoes. The high incidence of these problems and those relating to waste disposal (51%), is alarming and suggests a

TABLE 4.5. Problems reported by rehoused and non-rehoused households

Problem area	Percentage of household heads indicating their household had a problem or a complaint	
	Non-rehoused households	Rehoused households
1. Crowding inside the house	44.8	17.1
2. Sewers, drains	59.7	21.7
3. Waste disposal	50.6	7.1
4. Water supply	53.9	3.3
5. Electricity supply	46.3	1.8
6. Construction faults (cracks, leakages)	20.4	14.4
7. Personal security (thefts, violence, rapes, etc.)[a]	7.8	5.0
8. Mosquitoes or other insects	85.1	69.5
9. Rats	59.7	25.2
10. Noise or other nuisance related to neighbours	20.9	31.0
11. Availability of transport[a]	7.8	5.8
12. Distance to market[a]	9.1	6.5
13. Distance to work	12.3	21.7
14. Distance to school	4.5	14.4
15. Distance to shops[a]	1.5	1.0
16. Distance to places of worship[a]	4.0	3.0
17. Distance to hospital[a]	12.3	12.3
18. Vandalism	2.3	0.3
19. Others[a]	5.5	6.0
Average number of complaints/problems per household	5.09	2.67

[a]Differences not significant ($p > 0.05$). All other differences significant at this confidence level.

clear danger to public health. The incidence of these and most other problems drops after rehousing. However mosquitoes continue to be a problem (70%). They are of course, least important among residents of high-rise flats (scheme *F*). It is noteworthy that the percentage of complaints about crowding remains at a fairly high level (17%) confirming the earlier impression that although an improvement of crowded conditions is discernible it is certainly not

impressive. The category 'others' pertains mainly to flooding problems in respect of squatters and lift trouble[6], heat[7], and access road problems in respect of rehoused squatters.

In some cases high percentages are entirely due to circumstances pertaining to one particular housing scheme. For example 90% of the rehoused households complaining about sewerage problems (22% of the total number of households) are living in housing schemes *A* and *B*, where sewerage and drainage conditions were notoriously bad at the time of the survey (since then work has been carried out to improve the situation). Sewerage and drainage conditions in these schemes also explain two-thirds of the waste disposal complaints of rehoused households and nearly 80% of their rat problems (25% of all rehoused households complained about this problem).

Another interesting feature is, that the level of satisfaction concerning the structural condition of the house is not much higher for the rehoused squatters than for the non-rehoused ones: in spite of the newness of the housing schemes 14% of the rehoused households reported construction faults compared with 20% among non-rehoused households.

It appears that rehousing has given rise to increased problems related to noise and other nuisances related to neighbours. As could be expected, this problem figures high in the 20-storey (*F*), and in the 4-storey (*D* and *E*) flats (50% of the interviewed households in these schemes reported this complaint).[8] It is of little importance in terrace housing schemes *A*, *B*, and *C* (6%).

Other problems that increase with rehousing are problems related to distances to work and school. These increased distance problems

6. All these complaints came from residents in 20-storeyed scheme *F*: 15% of the interviewed tenants there claimed they had experienced elevator problems. Similar problems were reported in high-rise low-cost housing schemes in Penang. See Jagatheesan (1973, p. 19).
7. Almost all in scheme *C*. 20% of interviewed occupants reported this complaint. The probable reason for this is the insufficiently insulating roofing material.
8. Noise also appears to be a major cause of dissatisfaction with housing schemes in Penang. In the case of Rifle Range (17 and 18-storey flats), 65% of the residents complained of noise. See Jagatheesan (1973, p. 18 and p. 21).

particularly come from residents of schemes *B* and *E*, which are located relatively far from the centre of Port Kelang and Kuala Lumpur respectively. Moreover these housing schemes are rather far from the areas where the interviewed rehoused squatters lived before rehousing, whereas in the case of the other schemes, squatter households have been rehoused on the spot (*D*) or in the vicinity (*C* and *F*).

Overall levels of satisfaction with housing conditions and environment is lower for non-rehoused households than for rehoused households: complaints average nearly twice as much in the former case.

The pattern of perception as discussed above is confirmed by the data provided in table 4.6. All interviewed rehoused households have been asked to compare their present housing conditions with their previous housing conditions when they were living in a squatter area. Their non-rehoused counterparts have first been asked whether they had been inside any of the housing units into which a number of households from their area had been rehoused, and were then asked to compare housing conditions in those units with conditions in their present environment. 76% of the interviewed non-rehoused replied the first question in the affirmative, so it is not unreasonable to assume that the interviewed squatters are well aware of the advantages and disadvantages that the housing schemes would bring them as compared with their squatter housing environment.

Table 4.6. shows that the relative appreciation of housing conditions in the housing schemes is high, from both the point of view of rehoused and non-rehoused households. This applies to all aspects singled out for separate appraisal, except to the noise factor. On balance, this aspect is perceived as being equally a problem in the two situations by the non-rehoused households, but the rehoused households are more negative. Nearly 34% of them regarded their new housing as worse than their previous housing in this respect, whereas nearly 25% felt their new housing was superior. The new housing was acclaimed most superior by both rehoused and non-rehoused squatters alike in respect of cleanliness and convenience.

TABLE 4.6. Opinions of non-rehoused and rehoused households concerning changes in housing conditions and environment after rehousing (percentage of households).

	The new housing provided is									
	Much better than the squatter area		Somewhat better than the squatter area		About the same as the squatter area		Somewhat worse than the squatter area		Much worse than the squatter area	
Aspects	Non-rehoused households	Rehoused house-holds	Non-rehoused households	Rehoused house-holds	Non-rehoused households	Rehoused house-holds	Non-rehoused households	Rehoused house-holds	Non-rehoused households	Rehoused house-holds
Space	56.5	60.1	20.5	14.9	13.1	13.8	6.8	10.1	3.1	1.1
Convenience	60.2	65.7	27.0	21.6	7.1	9.3	4.7	2.8	1.0	0.6
Cleanliness	72.9	74.2	22.2	21.6	4.6	3.7	–	0.6	0.3	–
Personal security	46.9	54.2	14.7	15.7	36.6	28.7	1.5	1.4	0.3	–
Access	47.3	48.0	19.1	16.3	28.8	30.1	3.3	3.7	1.5	4.8
Noise[a]	17.9	17.1	11.7	7.9	44.8	41.3	14.5	25.6	11.1	8.1
Overall living Conditions	66.8	71.1	20.7	15.7	8.3	10.7	3.0	2.0	1.2	0.6

[a] Difference in appreciation between rehoused and non-rehoused households highly significant ($p < 0.005$).

4.3.3.3. Summary review of changes with rehousing

Rehousing of squatters into the schemes studied has brought substantial improvement in housing conditions for the rehoused households. Increased availability of amenities like piped water, electricity and sanitary facilities constitute the most significant improvements, whereas improvement in crowding appears to be smaller. Rehousing did not affect curtilage use significantly. Distances to work and school are adversely affected if rehousing is not carried out on the spot but distances to shops and other less frequented social infrastructural facilities are not affected much.

Changes in physical housing conditions and environment are also perceived as substantial overall improvements, both by rehoused and nonrehoused households. However it is clear that rehousing does not constitute an improvement in all respects: for several of the housing schemes perceived, problems of noise and distances to work and schools increased substantially with rehousing.

5. Estimation of national parameters for Peninsular Malaysia

5.1. NATIONAL GOALS AND THEIR RELATIVE IMPORTANCE

As indicated in section 4.2.2 the policy aims to be taken into account in the formal CBA framework consist of the following:

—to increase the level of aggregate comsumption; and
—to achieve a more equitable interpersonal and inter-ethnic distribution of income,

constrained by the condition that no redistribution of existing stakes in the economy takes place, but that the desirable redistribution must be achieved through differential increases of consumption levels of favoured groups compared with non-favoured groups (see also sections 2.6.2 and 2.6.3). This implies that these groups must be identified and the relative weight of increases in their levels of consumption established (see also appendix A, section 3.2). In the context of the NEP the following classification scheme of target groups appear to be useful:

I. Poor Malays (42.0%)	*II.* Poor non-Malays (16.4%)
III. Non-poor Malays (14.7%)	*IV.* Non-poor non-Malays (26.9%)

of which groups *I*, *II* and *III* can be identified as groups in the population that are supposed to receive favoured treatment by the government. It remains to further specify those groups and to determine their consumption weights. Ethnic divisions are obvious and various concepts of poverty have been discussed in section 3.4.3. If an absolute poverty-line household income of M$200 per month

is adhered to, the figures in brackets above indicate the percentages of all households in Peninsular Malaysia in each group in 1970.

If it were felt that a dollar of net aggregate consumption benefits is equally valuable irrespective of which group it accrues to, then obviously this implies that the weights for each group would be equal and unity. However, once this postulate is dropped, and in the absence of explicit weights set by the government, only a hypothetical range of weights can be specified for each group. Supposedly such weights are derived from a social welfare function. If it can be assumed – as in the Malaysian case – that the desirable redistribution has to come about through differential increases in consumption levels for each group and not by enlarging consumption of one group at the expense of the existing consumption level of another, then the social marginal utility of consumption for all groups will be > 0 (non-negative weights for all groups).

As a starting point in estimating the order of magnitude of weights, the poor (groups *I* and *II*) are contrasted to the non-poor (groups *III* and *IV*). If the consumption distribution weight W_x, associated with consumption level C_x, is defined as:

$$\frac{U_{C_x}}{U_{C_m}},$$

i.e. the social marginal utility of consumption at level C_x divided by the social marginal utility of consumption at the mean C_M and if social marginal utility U_C is specified as:

$$U_C = aC^{-e}$$

(marginal utility decreases as the level of consumption increases), then:

$$W_x = \frac{U_{C_x}}{U_{C_m}} = \left(\frac{C_m}{C_x}\right)^e$$

Thus the weight W_x can be thought of as depending on the relative

consumption level and the utility parameter e (see Squire and van der Tak, 1975, pp. 63–64). If redistribution is of no concern, $e = 0$ and $W_x = 1$ for all consumption levels. If $e = 1$, W_x decreases proportionately with increases in the relative consumption level vis-à-vis C_m.[1] Following Squire and van der Tak (1975, pp. 102–103), a range of e from 0.5 to 1.5 will be considered, allowing for differences in the extent of the egalitarian bias in government policy.[2] The mean household income for the poverty groups (those households below the poverty-line household income of M$200) was estimated at M$110 per month in 1970, for the non-poverty groups at M$493, while the mean for all households was M$267. Disregarding possible differential saving propensities, this means that

$$\frac{C_m}{C_p} = 2.43 \text{ and } \frac{C_m}{C_{np}} = 0.54,$$

which yield the following values for W at various levels of e

	poor	non-poor
$e = 0.5$	1.56	0.73
$e = 1.0$	2.43	0.54
$e = 1.5$	3.79	0.40

It should be noted that e is likely to change over time: as mentioned in section 2.6.3, during the SMP period (1971–1975) redistributional policies were strongly focussed on inter-ethnic income differences, while interpersonal income differences irrespective of race were thought to require much less attention. Judging from the TMP document and pronouncements by political leaders and bureaucrats this order will be reversed during the TMP period (1976–1980) but the absolute differential in importance will be less.

1. This is equivalent to weighting the growth rate of income in each income class by its share in population. See Chenery et al. (1974, pp. 38–51).
2. This may appear to be a bit conservative in the light of estimates for e of 2.3 based on consumer expenditure data in India and 1.5 to 1.8 based on the direct tax structure in various countries. See Fellner (1967), Helmers (1977, pp. 208–210) and Lal (1972a, p. 11).

Inter-ethnic distributional weights can be treated in a similar way by comparing income shares of Malays and non-Malays in the aggregate to their respective population share. Malay and non-Malay shares in aggregate disposable income were 0.37 and 0.63 respectively in 1970, while population shares were 0.532 and 0.468 in that year. If W_y is defined as

$$\left(\frac{S_p}{S_i}\right)^k, \text{ in which}$$

S_p = population share,
S_i = income share, and
k a utility parameter ($k > 0$),

$\frac{S_p}{S_i}$ = 1.44 for Malays and 0.74 for non-Malays, yielding the following values for W_y at various levels of k:

	Malay	non-Malay
$k = 0.5$	1.20	0.86
$k = 1.0$	1.44	0.74
$k = 1.5$	1.75	0.65

As overall weights for groups *I* to *IV* it is proposed to use arbitrarily $W = W_x \cdot W_y$, which formula has some intuitive appeal: the consumption weight of those households in a favoured group on two counts (*I*) is highest, while the weight of non-favoured group *IV* will be lowest, with *II* and *III* in between. Actual values depend on values selected for e and k. Some examples are provided in table 5.1 below, in which values for e and k are selected which are thought indicative for priorities during the SMP and TMP periods.

The utility weights W to be attached to consumption of each group are supplemented by premium weights α (utility weights

TABLE 5.1. Consumption weights for different groups.

Period	W_I	α_I	W_{II}	α_{II}	W_{III}	α_{III}	W_{IV}	α_{IV}
SMP, 1971–1975 ($e = 0.5$, $k = 1.5$)	2.69	(1.69)	0.99	(−0.01)	1.27	(0.27)	0.47	(−0.53)
TMP, 1976–1980(I) ($e = 1.0$, $k = 0.5$)	2.92	(1.92)	2.09	(1.09)	0.65	(−0.35)	0.46	(−0.54)
TMP, 1976–1980(II) ($e = 1.5$, $k = 1.0$)	5.46	(4.46)	2.80	(1.80)	0.58	(−0.42)	0.30	(−0.70)

minus unity) between brackets. Application of premium distributional weights rather than utility weights enables a separate appraisal of aggregate consumption costs and benefits (in which all weights are unity) from the project's redistributional impact, which is to be preferred for clarity of exposition.

It should be stressed that the above numerical examples are nothing more than highly stylized results, representing an order of magnitude based on not too implausible assumptions. In the calculus for the case-studies a specific pattern of values for e and k over the project's lifetime will be postulated that is thought to be most realistic. Sensitivity analysis is carried out by employing alternative values of e and k each within the range of 0.5 to 1.5 (section 6.3.5 and appendix D).

5.2. THE SOCIAL DISCOUNT RATE (SDR)

As indicated in Appendix A, section 6, the value of the SDR to be used in CBA – the rate of decrease of the weights attached to net aggregate consumption benefits accruing over time – depends on the elasticity of social marginal utility with respect to per capita consumption and the expected growth rate of per capita consumption during the period considered. In some formulations also a 'pure' social rate of time preference is added as a separate component. This provides very little concrete insight as shown below. Two alternative formulations of the SDR are as follows:

A. $\text{SDR} = (1 + g_t)^e - 1$ (This formula results from the specification of social marginal utility of consumption in the previous section. See also Lal, 1972, p. 9)

B. $\text{SDR} = p + eg_t$ (Blitzer, 1973. p. 12)

in which g_t = growth rate of per capita consumption
e = – (elasticity of social marginal utility with respect to per capita consumption) > 0
p = 'pure' social rate of time preference

Average growth rates of real private per capita consumption are 2.3% and 3.6% (expected) during the SMP and TMP period respectively. If again we hypothize that $0.5 \leq e \leq 1.5$, as in the previous section (there is, after all, no particular reason why the elasticity of social marginal utility with respect to per capita consumption in an intertemporal comparison should be different from the elasticity used in an interpersonal comparison) this would provide the following SDR's:

SMP	e =	0.5	1.0	1.5
Alternative A		1.1	2.3	3.5
Alternative B		p + 1.2	p + 2.3	p + 3.5
TMP	e =	0.5	1.0	1.5
Alternative A		1.8	3.6	5.5
Alternative B		p + 1.8	p + 3.6	p + 5.4

It has been suggested that p be put between zero and 5 percent (Squire and van der Tak, 1975, pp. 109–110), depending on the assumed government obligation to future generations as compared to the present.

In Malaysia there is no reason to attach a premium to savings/investment (which would imply a relatively low p) vis-à-vis consumption. Aggregate savings are already quite high (sections 2.4.2 and 2.6.2) and were certainly not suboptimal during the sixties and the SMP period. Moreover, in case a yet higher rate of savings were desirable during the TMP period and/or thereafter, these savings could be raised through commercial borrowing on the international capital market or by the relatively well-developed fiscal machinery (through

increases in EPF contributions, in indirect taxes or across-the-board increases in direct taxes).[3]

There are no major distortions in Malaysia's capital market, which in the virtual absence of foreign exchange restrictions is closely linked to capital markets abroad.

In view of all this it may be held that in the Malaysian case the SDR should be equal to the marginal productivity of capital and the prevailing capital market rate of interest for gilt-edged securities. However, nominal capital market rates (especially the more recent ones) to some extent incorporate a compensatory component against inflation (table 5.2), whereas the SDR required will be used to discount costs and benefits in real terms and clearly should be lower than nominal rates. The case study schemes selected have all been initiated during 1966–1970, when inflation was still virtually

TABLE 5.2. Long term interest rates and inflation (percentages).

Year	Minimum lending rate commercial banks (prime rate)	Rate offered on Malaysian Government Long-term (15–20 years) securities	World Bank long-term (commercial) lending rate	Consumer price index, Peninsular Malaysia (1967 = 100)
1967	7½	6	6	100
1968	8	6¼	6¼	99.8
1969	8	6¼	6½	99.4
1970	8	6½	7	101.3
1971	8	6½	7¼	102.9
1972	7½	7	7¼	106.2
1973	8	7½	7½	117.4
1974	9½	8	7¾	137.8
1975	9	8	8½	144.0

Sources: Bank Negara Malaysia, Quarterly Economic Bulletins; World Bank, Annual Reports.

3. Malaysia is fortunate to be in a different position from most developing countries in this respect. In contrast (as noted in section 2.6.2), it is politically not feasible to use the fiscal machinery to effect direct income transfers from one of the above (section 5.1) groups to another to the extent envisaged in the NEP.

absent in the country and it appears reasonable to put the then prevailing SDR at 6% to 7%.
As for rates used in other cost-benefit studies dealing with Peninsular Malaysia, most frequently alternative rates of 5%, 10% and 15% have been employed (Syed Hussein Wafa, 1974b, pp. 15–17; Hoerr, 1973, pp. 258–259). However, Little and Tipping (1972, p. 56) use rates of 7% and 12%. The EPU estimate of public opportunity costs of capital is 10% (Hoerr, 1973, p. 259). In the present study two key figures will be used as SDR, the 7% rate, which seems to be most appropriate on theoretical grounds, and the 10% EPU rate emanating from the government. In addition to that, switching values (algebraically equal to the internal rate of return) will be estimated for each scheme.

5.3. ACCOUNTING RATIOS

5.3.1. Introduction: factor market distortions

Estimation of shadow or accounting prices becomes necessary when market prices do not correctly reflect the willingness to pay for net output or net inputs of the project (see appendix A, section 5.1). In the case of the project's output physically adding to the availability of a good or service to the economy the market price of this good may understate consumers' willingness to pay for it, in which case the market price will have to be corrected upward.

In all other cases, both of net output (substituting for domestic supply elsewhere or imports) and of net inputs, what needs to be estimated is the value of real resources saved or foregone elsewhere in the economy. These real resources ultimately consist of:

—foreign exchange
—labour (of various levels of skills)
—land
—entrepreneurial activity

The value of real resources saved or foregone elsewhere may

deviate from market prices in case of distortions in factor markets. The following sections discuss, for each factor in turn, the existance of such distortions in the case of Peninsular Malaysia and to what extent they give rise to a deviation of the shadow or accounting price from the market price. Where this applies, the so-called accounting ratios – the accounting price divided by the market price – will be estimated.

5.3.2 Foreign exchange

Even for housing projects the shadow-price of foreign exchange assumes considerable importance: although output (housing services rendered) is non-tradeable and clearly augments domestic supply, a substantial proportion of total inputs is directly or indirectly imported or used at the expense of potential exports (see section 3.5.5).

The accounting ratio for foreign exchange is determined by the extent to which distortions exist in the market for foreign exchange, In the Malaysian case these distortions are slight compared with most other countries. Rationing of foreign exchange is absent and the effect of quotas can be ignored as they are virtually non-existent. Import duties during 1966–1973 averaged approximately 13% of imports (c.i.f.). Contrary to many other countries, export subsidies as such are negligible in Malaysia and export duties fairly substantial, averaging approximately 5% of exports (f.o.b.) during 1966–1973.

Import duties have the effect of raising the domestic price level (assuming supply elasticities for Malaysian imports to be high), whereas export duties tend to lower the domestic price level vis-à-vis world market prices (demand elasticities for Malaysian exports are assumed to be high in spite of its dominant position in the world export of natural rubber and tin – in the case of rubber competition from synthetics accounts for this; and Malaysian tin exports are declining).[4]

4. See also J. H. Power, *The structure of protection in West Malaysia*, in Balassa et.al., 1971), who has estimated the average demand elasticity for Malaysian exports to be in the range of 5 to 10.

If it is also assumed that the marginal unit of foreign exchange foregone affects imports and exports alike (depending on the demand elasticity for imports and the supply elasticity for exports), the formula in appendix A, section 5.1 yields an accounting ratio (A.R.) of foreign exchange of 1.04; in other words, an estimate of the shadow-price of foreign exchange which is 4% above the official exchange rate, so the Malaysian Ringgit is overvalued to that extent.

This order of magnitude is in line with conclusions reached in other studies. Power (1971, p. 218) estimates that with varying assumptions regarding demand and supply elasticities for Malaysian exports and the import demand elasticity, the percentage overvaluation ranges from a low of 2.4% to a high of 7.6% and concludes that: "The estimate corresponding to the highest elasticities in every case (perhaps the best long-run guess) is about 4%" (Power, 1971, p. 218; see also Helmers, 1977, pp. 243–244). Syed Hussein Wafa (1974b, p. 10) quotes an alternative estimate of the divergence, ranging from 3% to 6%. In view of this slight deviation he subsequently takes the market price as representing the correct scarcity value of foreign exchange in the Malaysian case. Little and Tipping (1972, pp. 28–29) have estimated domestic prices to be about 10% higher than world export prices, based on the assumption of high long-run foreign elasticities and a higher demand elasticity for imports than the supply elasticity for exports, indicating that, on balance, the price-raising influence of import duties is stronger than the price-lowering influence of export duties.[5]

In view of these differing estimates of the A.R. of foreign exchange, the value of 1.04 will be taken as central alternative and sensitivity analysis will be applied using A.R.'s ranging from 1.00 to 1.10.

5.3.3. Labour

Labour market distortions may be caused by monopoly power of unions or employers (including the government), by locational

5. See also Thillainathan (1976, p. 259), who uses the same assumption.

factors as well as by government intervention in the form of legislation and taxation, causing the social opportunity costs (SOC) of labour to deviate from its market price. This deviation is of particular interest if simultaneously a situation of widespread unemployment and underemployment prevails. It generally applies predominantly to unskilled labour. In the present section the SOC of both skilled and unskilled labour will be discussed.

Generally speaking, four main elements of the SOC of labour have been identified in the literature:[6]

A. the social value of output foregone in alternative employment elsewhere;
B. the social costs of urbanization (such as costs of rural–urban migration and the cost-of-living differential between urban and rural areas) if labour used by an urban project is ultimately drawn from rural areas;
C. the social costs of increased commitment to consumption associated with the employment generated (this presupposes a premium attached to savings and investment vis-à-vis consumption and a shift from savings and investment to consumption caused by increased employment);
D. the social value of the increase in private disutilities of effort associated with this employment.

The last two elements may be dispensed with quickly in the Malaysian context. As indicated in section 5.2 there is no good reason to attach a premium to savings and investment over consumption, which means that the third item has no relevance for Malaysia. Secondly, in the face of substantial unemployment and underemployment (see below) social valuation of increases in private disutilities may be disregarded quite safely. This reduces the discussion to two cost elements only.

To determine the value of the SOC of labour the ultimate source

6. See e.g. Little and Mirrlees (1974, pp. 270–277), Lal (1974, pp. 31–39), Thillainathan (1976, pp. 146–151), Hansen (1973, pp. 23–30), Squire and van der Tak (1975, pp. 78–87).

of labour used by the project should be known in order to estimate its alternative use foregone and the social costs of urbanization (if relevant). This means that the extent of unemployment and underemployment among the various types of workers used by the project is of great importance, as well as the extent of compartmentalization in the labour market for workers having varying and different degrees of skills. It is reasonable to expect that for jobs requiring little or no specific skills this compartmentalization is of no importance and that workers used by the project who carry out such jobs ultimately have either been drawn from the pool of unemployed or have reduced underemployment in peasant agriculture or in the urban informal sector. For jobs requiring a relatively high level of skills this will not generally be the case. The worker employed by the project in such a job will most likely have been drawn from similar employment elsewhere or, being unskilled, have received specific training for the job prior to this present employment.

Some data regarding unemployment and underemployment in Peninsular Malaysia are provided in table 5.3. The discussion is primarily concerned with the employment situation during 1967–1971 when the housing schemes studied have been constructed. Table 5.3 indicates that in 1967–1968 there was considerable open unemployment, notably in urban areas. For metropolitan towns (more than 75,000 population) and state capitals the percentages of actively and passively unemployed were 10.1% and 1.6% respectively.

In addition to open unemployment, 30.9% of the labour force was not fully employed and for 10.3% one could speak of underemployment as defined in note 7. Unfortunately no urban-rural breakdown of underemployment figures is availabe. Underemployment by occupational data show that three quarters of underemployment could be found in agricultural occupations in 1967–1968. However the distribution of underemployment by industry and occupation also indicated that underemployment formed a sizeable percentage of the labour force in all industries and occupational groups, except in the sector of electricity, gas, water and sanitary

TABLE 5.3. Labour force, employment, unemployment and underemployment Peninsular Malaysia, (1967–1968).[7]

	Urban Areas		Rural Areas		Total	
	.000	As % of urban labour force	.000	As % of rural labour force	.000	As % of total labour force
Labour force	816.0	100.0	1,781.8	100.0	2,597.8	100.0
Actively unemployed	80.7	9.9	96.0	5.4	176.7	6.8
Passively unemployed	15.0	1.8	40.7	2.3	55.7	2.2
Employed	720.3	88.3	1,645.1	92.3	2,365.4	91.0
Employed full-time or for more than 48 hours per week	n.a.	n.a.	n.a.	n.a.	1,562.8	60.1
Employed 25–48 hours per week	n.a.	n.a.	n.a.	n.a.	535.3	20.6
Employed less than 25 hours per week	n.a.	n.a.	n.a.	n.a.	267.3	10.3

7. These data (as well as most other data referred to in the discussion) are taken from the *Socio-economic Sample Survey of Households, Malaysia 1967/68* (MSSH), still the most recent large-scale labour force survey undertaken in the country. Additional, more recent information originates from the labour force surveys undertaken bi-annually by the Department of Statistics since 1971. Samples used in these surveys are somewhat smaller than the one used in the MSSH enabling a lesser extent of disaggregation. Conceptually there are only minor differences. The following concepts have been used in the MSSH:
   —Labour force: all persons between the ages of 15–64 who are either employed or unemployed.
   —Employed: all persons who had worked for pay or profit or family gain during the period of reference of MSSH; all those who were temporarily absent from work during the reference period for reason of illness, accident, leave or holiday, bad weather, industrial dispute or any temporary lay-off or absence of work of similar nature; and unpaid helpers assisting in the operation of an economic activity during the reference period.
   —Unemployed: all those persons who did not work at all any time during the reference period and were looking for a job or work. This category was further classified into:
   A. those actively looking for a job or work for pay or profit; and
   B. those who were not actively looking for a job or work, but will accept a job if given.
   —Underemployed: persons involuntarily working part time or for shorter than normal periods of work. This is known as visible underemployment. The survey denoted a person working less than 25 hours a week, but willing and able to do additional hours at the normal rate of renumeration for that work, as underemployed.

services and in clerical occupations. This implies that underemployment, though most important in rural areas, is not an irrelevant phenomenon in urban areas.

Active unemployment is primarily a problem of youth unemployment. Actively unemployed in the age bracket 15–24 accounted for 75% of total unemployed and unemployment as a percentage of the labour force was particularly high in the 15–19 (20.5%), and 20–24 (11.4%) age brackets. For urban areas this pattern was even more pronounced, figures being 33.2% and 18.0% for these age brackets respectively.

Active unemployment was heavily concentrated among those having lower/middle and upper secondary education (18.1% and 16.8% respectively out of the labour force with such educational levels) and surprisingly less among those with no formal or only primary education (2.4% and 5.9% respectively; of course absolute numbers of unemployed in thise categories were much higher than for the 'educated' unemployed). This pattern applies both to urban and rural areas, but the differences in percentages are greater in the latter case.

Concerning those actively unemployed who had been employed previously (35% of actively unemployed), data have been collected regarding their previous employment. Compared to the employment structure, unemployment was relatively high among those previously employed in mining and quarrying, manufacturing, construction, transport, storage and communications as well as services (table 5.4). Unemployment in agriculture and primary products processing was relatively low. This pattern is also reflected in unemployment data by occupational category. In urban areas unemployment was particularly high among former clerical workers, craftsmen and production process workers, labourers and service occupations, while only 3% of all actively unemployed in urban areas had held agricultural jobs before.

Data were also collected in the survey on job preferences of those actively unemployed. Generally these preferences tended to be focussed on those occupations where active unemployment was already relatively high, notably on clerical and labourers' jobs.

Passive unemployment was generally concentrated among those

TABLE 5.4 Sectoral structure of employment and actively unemployed, but previously employed, Peninsular Malaysia, (1967–1968).

Sector	Sectoral employment as a percentage of total employment	Sectoral breakdown of jobs held by actively unemployed but previously employed, as a percentage of total
Agriculture	21.2	5.3
Primary products processing	30.4	22.7
Mining and quarrying	3.1	6.6
Manufacturing	9.1	13.1
Construction	3.3	9.0
Electricity, gas, water and sanitary services	0.9	0.8
Commerce	10.8	9.8
Transport, storage and communications	3.6	5.1
Services	17.5	26.6
Not specified	0.2	1.0
Total	2,365,500 = 100	61,800 = 100

who had no formal education and those with primary education. In urban areas, however, those who had lower/middle secondary education also formed a sizeable share of those passively unemployed. As shown in table 5.3 passively unemployed accounted for 2.2% of total labour force.

As mentioned, available data for later years are less comprehensive and suffer from some conceptual differences, when compared with the MSSH data for 1967–1968. The TMP puts active unemployment in Peninsular Malaysia for 1970 at 241,000 (8% of labour force) and for 1975 at 273,000 (7.6% of labour force).[8]

8. Government of Malaysia (1976, table 8-2, p. 142). This table also presents data on the ethnic breakdown of unemployment (as a percentage of labour force of each ethnic group) as follows:

	Malays	Chinese	Indians	Others	Total
1970	8.1	7.0	11.0	3.1	8.0
1975	6.9	7.2	12.2	11.3	7.6

Labour force survey data for 1972 (table 2.11, section 2.4.2) show similar percentages of actively unemployed as compared to the 1967–1968 data in table 5.3. Percentages passively unemployed were lower in 1972, while underemployment was substantially higher than in 1967–1968, 14.5% overall, 7% in urban areas and 18.4% of labour force in rural areas.[9] Information relating to registrants in the employment exchanges in 1974 (of whom 73% were wholly unemployed) concerning their age, educational attainment and occupational group indicates that the pattern described for actively unemployed in 1967–1968 appears to be essentially unchanged in 1974.

Summarizing, it is clear that during the late sixties and early seventies considerable open unemployment existed, notably in urban areas, concentrated among youth who had at least completed primary education, but had not managed to complete their upper secondary education. Data on former employment and job preferences of actively unemployed indicate that the unemployment problem is most serious for unskilled labourers, skilled labourers and clerical workers, especially in urban areas. Underemployment was shown to be particularly important in rural areas (especially in agricultural occupations), but by no means negligible in urban areas.

The above data on employment, unemployment and underemployment provide some clue as to the most likely ultimate source of labour used by the housing projects.

First of all, in view of the high level of urban unemployment and the sectoral and occupational pattern of this unemployment (for instance, only a very low percentage of urban actively unemployed had held agricultural jobs before), it is unlikely that the projects would have ultimately caused underemployed peasants to migrate to urban areas.

9. As indicated in the TMP document (p. 141), the pattern of labour utilization in urban areas is fairly steady, whereas the proportion of the labour force in rural areas that is underemployed fluctuates rather strongly, especially in the agricultural sector. This is doubtless closely related to fluctuations in output and prices of main primary products such as rubber and rice.

Recent migrational studies of Peninsular Malaysia provide some support for this contention, indicating that:

—rural–urban migration has not been a very important phenomenon in explaining urbanization in Peninsular Malaysia (see section 2.3.3);
—migrants should not be exclusively identified with underemployed agricultural labour: a recent study of inmigration to metropolitan urban Selangor showed that only 13% of the sample of migrant workers into Kuala Lumpur had been engaged in agricultural pursuits prior to their move, whereas 46% had been entirely unemployed before migration (Narayanan, 1976, pp. 269–274);
—(potential) migrants generally act rationally and perceive the advantages and drawbacks of migration quite realistically (Narayanan, 1976, pp. 291–295; Soon Lee Ying, 1976, chapter V), including such factors as a high urban unemployment rate in various sectors (particularly in the construction industry) and a rural–urban cost-of-living differential of an estimated 20–30% (see Thillainathan, 1976, pp. 115–116).

With reference to the construction industry, there is one further reason why it may not have absorbed much underemployed agricultural labour, being the possible ethnic barriers that rural migrants (predominantly Malays) may have experienced or perceived in entering a Chinese-dominated industry.

In the case of unskilled workers employed by the projects the above means that these workers have either ultimately been drawn from the pool of unemployed or from the informal urban sector, where underemployment as well as marginal occupations are most prevalent and where wages are not generally institutionally but competitively determined. The unskilled workers directly or indirectly employed by the schemes studied consist of unskilled construction labour, unskilled workers in the construction materials industries and unskilled maintenance labour employed by local authorities.

Although some of the urban unemployed are 'educated' unemployed and may be unwilling to take up manual labour jobs in the above fields, the 1967–1968 data on job preferences of the actively unemployed indicated that this would certainly not be the case for the majority of the unemployed: slightly less than 30% indicated they were looking for white-collar jobs in professional, administrative and managerial positions or for clerical jobs. This, combined with the sectoral pattern of unemployment referred to above, points to the strong likelihood that unskilled labour employed by the schemes studied has ultimately been drawn from the pool of unemployed. In the case of unskilled construction labour it may be added that the common practice of hiring these workers on a daily basis or for piece work from among those who offer themselves at the site reinforces this likelihood. Also wage rates for unskilled construction workers were hardly affected during the building boom of 1972–1974, when prices of certain building materials and skilled labour wages rose steeply, indicating a high supply elasticity of unskilled labour.

In view of the above (admittedly limited and incomplete) data, it will be assumed that all unskilled labour used by the schemes has ultimately been drawn from the pool of unemployed so that the SWR (and A.R.) for this type of labour can be put at zero. If it were assumed that unskilled labour used in the urban formal sector would be entirely drawn from the urban informal sector (but as indicated, this is thought less likely for unskilled labour utilized by the schemes studied), data on wage rates and imputed supply prices estimated by Thillainathan (1976, table V-4, p. 129) would yield A.R.'s for unskilled labour in manufacturing of 0.59, in government service 0.54. If it is assumed that such labour is exclusively drawn from peasant agriculture, these A.R.'s would be 0.46 and 0.42 respectively. Of course, a weighed combination of all three sources could also be possible. In order to allow for this, sensitivity analysis will be applied, using A.R.'s for unskilled labour ranging from zero to 0.6.

For skilled labour (e.g. carpenters, joiners, masons, plumbers, etc.) and salaried labour (professional, semi-professional, technical

and supervisory, clerical) a somewhat different situation prevails. Although urban unemployment among those who had held skilled labour jobs and clerical jobs before and among those who by educational attainment would qualify for those jobs appears to be high, it would probably not be correct to assume that in all cases labour of these categories would ultimately be drawn from the pool of unemployed. This is because the categories skilled labour and clerical labour incorporate a multitude of jobs requiring specific skills. Some of these jobs, therefore, may be very difficult to fill, even in the face of substantial unemployment of skilled workers. This would be so especially for those jobs that require a considerable number of years of practical experience, which new entrants to the labour force, even if they possessed the requisite educational attainment, obviously would not have. It generally takes several years for unskilled workers to become fully skilled in any of the building trades, and this period appears to be reduced only slightly by the various government-sponsored training schemes in these trades (section 3.3.3). For clerical jobs the importance of experience would probably vary with the nature of the job and it is not likely that unemployed school leavers could fill all clerical vacancies available.

Unfortunately the 1967–1968 MSSH and other data available do not provide a sufficiently detailed breakdown of unemployment into particular skills and experience available, so as to provide an insight into how well unemployed skilled labour would have suited the construction industry at the time of construction of the housing schemes studied. As to clerical jobs, employment exchange data indicate that registrants for clerical jobs are generally inexperienced (95% of registrants in 1974 had no experience, 2.5% had less than one year's experience and 2.5% one or more years). Therefore it is reasonable to assume that only part of the skilled labour and clerical jobs generated by the construction of the housing schemes studied has ultimately reduced urban unemployment. Part of skilled and clerical labour used may have been drawn from the urban informal sector, and the remainder from other formal sector employment.

For lack of better information, therefore, it is assumed that

concerning skilled labour one third of labour employed has ultimately reduced unemployment (so that the SWR for that group can be taken as nil), whereas the productivity foregone of the remaining two thirds is assumed to be equal to their market wages, both for skilled labour drawn from the urban informal sector and for those employed in the formal sector. This would yield an A.R. for skilled labour of approximately 0.70 (the actual value depending on wage levels of the two groups distinguished). Sensitivity analysis will be applied using a range of 0.40 to 1.00.

Although it is not unreasonable to assume that the extent of ultimate reduction of urban unemployment is greater for clerical jobs, it must be borne in mind that clerical labour is only part of the category of salaried labour. Other labour in that category should be valued at its market rate, since unemployment of these labour categories is quite low. In fact, for professional, semi-professional and technical labour it is quite possible that the actual salary paid understates their marginal productivity foregone elsewhere and the willingness to pay for this productivity. This could be due to institutional rigidities in the relevant labour markets (government regulations) which limit mobility of labour in those categories in the face of scarcity of professional, semi-professional and technical skills. Looking at the group of salaried labour as a whole, therefore, it appears best to value this labour at actual salaries paid.

5.3.4. The accounting price of land

As mentioned in appendix A, section 5.1, for urban projects, land costs are often an important part of total costs. It appears as though the market price would be a good indicator of the opportunity costs of land as long as the land market is competitive. In the urban land market in Peninsular Malaysia two major problems prevent us from using the actual price paid as the opportunity costs of land:

A. Substantial portions of urban land are state (not federally) owned. State land is alienated on leasehold basis by the state government for a maximum period of 99 years. The price paid to the state for this alienation does not necessarily reflect its market

value. In addition to that, the state government may subject alienation to a number of conditions. This would especially be the case if the price paid is considerably below estimated market value. Conditions likely to be added include non-transferability of title and specific conditions related to land use. This introduces a non-competitive element into the land market. Similarly, in the case of Malay reserve lands, purchase of land is open to Malays only.

B. Both private and state land are subject to land-use and density zoning in gazetted urban areas and similar title conditions outside these areas. The same piece of land could have very different market values, depending on whether it is zoned, for instance, for residential or commerce use. Zoning has the effect of compartmentalizing the land market, restricting alternative land uses. The aim of land-use and density zoning is to guide the pattern of physical urban development according to planning objectives. Therefore zoning should be considered as part of the regulatory framework within which the market has to operate. Although it is sometimes possible to obtain conversion of land use (usually involving payment of a premium or having additional conditions added to the title), generally changes in zoning only take place when overall change of the physical development plan is undertaken. This usually occurs only after a plan has been used for a substantial numbers of years.[10] For the purpose of valuing land at opportunity costs in the best alternative use, zoning restrictions will have to be accepted as a rule, since it is generally unrealistic to assume that alternative uses precluded by those restrictions are a feasible option.

Regarding the land used for the housing schemes studied, an additional problem arises: where P.K.N.S., a statutory body under the Selangor state government, has built on Selangor state land no payment for land has been made since no alienation was involved.

10. An unintended effect of zoning, which may be noted in passing, is that through compartmentalization of the land market it occasionally stimulates urban land speculation. Especially expectation of land-use conversion strongly enhances this.

This applies to two schemes. In case of two other schemes, nominal payments were made to the state government by the Kuala Lumpur Municipality. This leaves only two schemes for which the commercial land price was available, and since in these two cases the land was acquired by the state government, it is uncertain whether the price paid really reflected prevailing market value.

For these reasons independent assessment of land values, based on prevailing land use and density requirements prior to development, have been carried out for the study by UDA's valuation section. In addition to that, valuations regarding two schemes have been obtained from other sources (see appendix C, section 1.3).

5.3.5. Profits and indirect taxes

Profits can be analytically split into rewards for entrepreneurial efforts and skills, and return to capital. This return to capital in turn may consist of the following components: depreciation, interest and monopoly profit.

The profits involved are predominantly profits made by contractors and sub-contractors. Profits made by this group account for two thirds to three quarters of all profit inputs, depending on the individual housing scheme. The remainder consists of profits by building materials traders and importers' margins (not profits by building materials producers, since all building materials have been assumed to be tradeable, their use causing foreign exchange costs), profits by suppliers of transport services as well as miscellaneous goods and services.

It appears that profits involved can largely be taken as rewards for entrepreneurial efforts, because:

—capital outlays by contractors, sub-contractors, traders and importers, expressed as a percentage of annual turnover, are relatively low compared to percentages in agriculture and manufacturing. For residential contractors in 1969–1972 value of fixed assets (machinery, equipment and buildings) averaged 8.6% of annual output. During those years net margin of residential contractors (after allowance for depreciation, but before direct

tax) averaged 12.1% of total turnover. If it can be assumed that a 10% interest on capital is considered normal, this would imply that interest on capital amounts to 0.9% of turnover, constituting only 7.4% of net margin. Interest on capital is only important in those sectors where capital outlays are relatively large compared to output. Concerning the profits made in construction of the housing schemes considered, this would only apply to profits earned by suppliers of transport services and some miscellaneous services which are a very small proportion of total profits.

—in the case of contractors and sub-contractors, profits have been estimated net of depreciation, which is therefore incorporated only in a quarter to a third of all profits, where it is not likely to be important, except in the case of suppliers of transport services (annual depreciation as a percentage of assets is negligible for buildings and can be put at 20–25% for machinery and equipment and transport equipment).

—it is not likely that the element of monopoly profit has been important in the composition of profits. Both Kuala Lumpur Municipality and P.K.N.S. maintain and regularly update (by open invitations to qualify) lists of contractors approved to carry out construction work of various types and sizes. Generally only contractors so qualified are invited to tender for a particular job. This procedure limits the possibility of collusive practices, which is further reduced by the absence of any organized form of pre-tender agreements among contractors (such as 'price improvement' schemes).[11] To what extent informal agreements exist is of course difficult to estimate. Tenders for all major contracts of the housing schemes studied were awarded at a time when there was no excess demand for construction. Construction work had been largely completed before the building boom picked up in mid-1971. Moreover, completion of two of the six housing schemes was delayed because the main contractor defaulted during the construction process. Entry into the construc-

11. For a description of these and other collusive tendering practices, see Organization for Economic Co-operation and Development (1976).

tion industry is relatively easy. The surveys of construction industries in 1972 and 1973 indicate that in those years the number of building contractors in Peninsular Malaysia was 3,689 and 3,613 respectively, of which 1,010 and 1,164 respectively has an annual output of M$ 100,000 or more in those years.

So it appears that at least an estimated 80% of total profit can be assumed to be rewards for intrepreneurial activities, the remainder being largely interest on capital. Rewards for entrepreneurial efforts should be valued at the willingness to pay for these activities foregone to the rest of the economy (as noted, it is inappropriate to place a premium on savings investment vis-à-vis consumption, so the effect on the rate of savings need not be taken into account and only the willingness to pay for entrepreneurial productivity foregone needs to be looked at). This implies that profits should be valued gross of direct taxes.

There is a case for applying the A.R. for skilled labour to entrepreneurial rewards, but there is no positive evidence that the housing schemes studied have ultimately reduced unemployment or underemployment among entrepreneurs. However some profits accrue to small sub-contractors and traders who are more likely to have been underemployed in the absence of the projects than main contractors. Unfortunately the distribution of profits over these entrepreneurial categories is not known.

For lack of any information of these points it is assumed that the actual profits earned adequately reflect the willingness to pay for entrepreneurial skills foregone elsewhere in the economy and the social opportunity costs of capital (insofar as the interest component is concerned). The A.R. for profits will thus be put at 1.0. To allow for possible unemployment or underemployment, sensitivity analysis will be applied using a lower limit of 0.7 (the skilled labour A.R.).

When project inputs are split as to primary factor incomes, the residual factor consists of indirect taxes. As a rule indirect taxes should be included in the valuation of inputs, if these are valued at the willingness to pay for their alternative use foregone (i.e. at the

demand margin, as has been assumed for the projects concerned, see next chapter). Imports are an exception to this rule. The real input in the case of imports is foreign exchange foregone by importing. This implies that imports (less domestic trade and transport margins) shoule be taken into account at their c.i.f. price and be multiplied by the A.R. for foreign exchange. Import duties should not be taken into account since these duties do not comprise an input to the project.

The 1970 input–output data indicate that 73.5% of commodity taxes on inputs from other sectors into the construction industry in that year were taxes on directly imported goods. A small proportion of that presumably consisted of taxes other than import duties, such as excise duties, road transport taxes or turnover tax. On the other hand, some additional import duty element would be incorporated in total inputs to the extent that domestically produced inputs contained imported elements on which duty would have to be paid. No information on the magnitude of these two offsetting factors is available, so it is assumed that approximately 75% of all indirect taxes levied consisted of import duty. This would imply that only 25% of total indirect taxes would have to be taken into account. However strictly speaking one further correction is needed. Some traded goods may have been used in the projects at the expense of potential exports. Again, the real input was supposed to be foreign exchange foregone. To the extent that export duties were levied on those goods, their domestic value would be less than their f.o.b. price, which should be used to calculate the amount of foreign exchange foregone at the shadow-price of foreign exchange. However the extent to which traded goods used in the projects have displaced exports must have been marginal in view of Malaysia's commodity composition of exports. Moreover, as shown earlier, export duties averaged only 5% of exports f.o.b. during 1966–1973. In view of these factors it is felt that ignoring this correction would hardly affect the extent to which indirect taxes should be taken into account. Consequently, the A.R. for indirect taxes will be put at 0.25; sensitivily analysis will use values of this A.R. ranging from 0.2 to 0.3.

TABLE 5.5. Assumed values of national parameters

Parameter	Symbol	Central value(s)	Range	
			Minimum	Maximum
1. Premium consumption weights		TMP (I)*, ($e = 1.0, k = 0.5$)		
I. Poor Malays	(α_I)	1.92	0.87($e = 0.5, k = 0.5$)	5.63($e = 1.5, k = 1.5$)
II. Poor non-Malays	(α_{II})	1.09	−0.01($e = 0.5, k = 1.5$)	2.26($e = 1.5, k = 0.5$)
III. Non-poor Malays	(α_{III})	−0.35	−0.52($e = 1.5, k = 0.5$)	0.27($e = 0.5, k = 1.5$)
IV. Non-poor non-Malays	(α_{IV})	−0.54	−0.74($e = 1.5, k = 1.5$)	−0.37($e = 0.5, k = 0.5$)
2. Social discount rate	(SDR)	7% and 10%	Internal rate of return (IRR) is calculated	
3. Accounting ratios				
—foreign exchange	(AR_{TG})	1.04	1.00	1.10
—unskilled labour	(AR_{UL})	0.00	0.00	0.60
—skilled labour	(AR_{SKL})	0.70	0.40	1.00
—salaried labour	(AR_{SL})	1.00	0.80	1.20
—urban land	Individual assessment		80% of central value	120% of central value
—profits	(AR_P)	1.00	0.70	1.10
—indirect taxes	(AR_{IT})	0.25	0.20	0.30

*except for years prior to 1976 (see section 5.4.)

5.4. SUMMARY REVIEW OF NATIONAL PARAMETERS

In the previous sections national parameters have been estimated on the basis of very limited information. The necessitates extensive sensitivity analysis to find out how sensitive project outcomes are to variations of these values within a reasonable likelihood interval. Table 5.5 summarizes the estimates and the intervals that will be taken into account in sensitivity analysis.

In the case of premium consumption weights, of course, no variant is possible in which weights for more than one group are simultaneously at a maximum or minimum value, since parameters to be varied are $0.5 \leq e \leq 1.5$ and $0.5 \leq k \leq 1.5$, each combination of any e and k within their respective ranges yielding a fixed set of weights.

Over the lifetime of the schemes studied the following assumptions have been made regarding the central values of e and k:

—prior to 1971: $e = 0.5, k = 0.5$;
—SMP period 1971–1975: $e = 0.5, k = 1.5$;
—TMP period 1976–1980 and thereafter: $e = 1.0, k = 0.5$.

6. Case-study analysis

6.1. INTRODUCTION

In this chapter an account is provided of the results of the cost–benefit appraisal for all six schemes. In addition to that, a discussion on some miscellaneous impacts of the schemes that could not be incorporated in the CBA is included. These consist of projects' impacts on complementary aims and highlight some effects of rehousing squatters from ethnically homogeneous areas into multiracial housing schemes.

Detailed estimates of all cost and benefit items for each scheme, as distinguished in section 4.2.2, are provided in appendix C. This includes aggregate consumption costs (construction costs, land costs, operating costs and relocation costs) and benefits (value increases of cleared sites, tenants' welfare benefits and externalities), as well as a regrouping of project beneficiaries in terms of target groups *I* to *IV* distinguished in section 5.1 and the resulting estimates of net present value of redistributional benefits to each target group.

6.2. RATE OF RETURN ANALYSIS

6.2.1. Lifespan of schemes

An evaluation of the financial returns of the projects to the government and a CBA of the projects from the national-economic point of view both require an assumption regarding the lifetime of the schemes during which costs, revenues and benefits will be discounted to their present value.

A distinction should be made between technical and economic

life time. (Compare Stone, 1976, pp. 240–242). The technical life of a housing scheme varies greatly, depending on techniques and materials used in construction, climatological factors and soil constitution. For the housing schemes studied, all of which are brick and/or concrete structures, a technical life time of 50–100 years is not at all unlikely.

However the lifetime that should be considered in project appraisal is the economic lifetime of the project. This can be defined as the period during which higher net returns can be reaped by the project than by replacing it by another available substitute. Mainly due to rapid technological progress on the supply side and changes in consumers' tastes on the demand side the economic lifetime for industrial investments is often much shorter than its technical lifetime. For investments in the social sphere this difference is much smaller, notably for housing. Technological progress in housing construction is relatively slow, causing relatively low productivity increases. This limits the possibility of producing dwellings comparable to the existing schemes in terms of standards at lower costs. On the demand side it may be expected that housing standards demanded will gradually rise with increases in aggregate incomes. However, this is a very lengthy process, which for individual schemes is yet further retarded as a result of the 'filtering down' mechanism. Finally, rapidly increasing urban land prices could make it financially attractive to replace a scheme before the end of its technical life. However assuming that land use and density zoning regulations governing the site of the scheme remain unaltered during the scheme's technical life this is not likely to make much of an impact. So, all in all, it is unlikely that it would pay to demolish the housing scheme and replace it by a scheme of superior quality before the structural condition of the building begins to deteriorate, causing annual operating costs to increase significantly and annual revenues and benefits to decline, both of which of course unfavourably affect net returns.

For these reasons the economic life span of housing schemes (provided no changes in land use or density zoning are allowed for the scheme's land) is not likely to be much shorter than their tech-

nical lifetime. For the schemes studied an operating period of 50 years has been assumed. It is clear that at reasonably high discount rates it makes little difference to the appraisal whether the estimated lifetime would be 30, 50 or even 100 years. Any benefit or cost applying to the later years of the project's lifetime will be heavily discounted and consequently have a low present value. At 10% for instance, present value of $ 1,000 accruing 30 and 50 years hence is only $ 57.31 and $ 8.52 respectively.

Included as terminal value for each scheme is only the value of the land utilized, which is assumed to be the same (in constant 1973 prices) as at the time when the scheme was constructed, more than 50 years earlier. Obviously, to the extent that land values rise faster than overall price levels, this assumption is conservative. It is assumed that the structures themselves have no net scrap value after 50 years (taking demolition costs into account). While such assumptions are crude, this does not really matter: the exact magnitude of the terminal value is unimportant, since it accrues only at the end of the project's economic lifetime.

6.2.2. Financial returns to the government

One way of looking at financial returns is to consider only actual cash-flows to and from the government. This means that construction costs, operating costs, relocation costs, rental and sales revenues, quit rents and assessment rates (see appendix C section 1.4) are taken into account only to the extent that expenditures are actually disbursed by and revenues actually accrue to the government.

Such an approach leaves out of consideration that expenditures and revenues may be incurred by or accrue to different government bodies and also ignores payments from one government agency to another. The government is treated as a monolithic entity. This is comparable to calculating net returns for a multi-activity or multi-branch firm, and as such is perfectly admissible. However what is more objectionable from a cost accounting point of view is the exclusion of those financial costs and benefits to the government that are not reflected in any direct cash-flow. Examples are the

use of government-owned land for the sites of housing schemes (which does not result in any external cash-flow, although premium payments are sometimes made from one government agency to another) and value increases of cleared government land. Obviously, if the government has to acquire land for the schemes or if it would sell the land cleared of squatters, the cash-flow pattern will be quite different. So in addition to net present values (*NPV*) and internal rates of return (*IRR*) based on actual cash-flows, an additional set of figures is presented, which takes into account these potential cash-flows by imputation (table 6.1 and 6.2). Where such data are available (schemes *C*, *E*, and *F*) premiums paid to the state government[1] serve as a basis for the imputation of land costs, in case of scheme *D* the lowest estimate from table 2, appendix C is used. Concerning value increases of cleared government lands it is assumed that the government realizes such gains in the year of clearance to the extent indicated in table 7, appendix C (bearing in mind that for scheme *A* only an estimated 26% of total value increase accrued to the government).

Additional annual benefits accrue to the government as a result of tenants' reduced utilization of health facilities after rehousing (again a financial benefit – savings – to the government not involving any direct cash-flow). For the schemes where such reduction was found, it is assumed that two thirds of the amounts (table 10, appendix C) accrue to the government (the remainder to employers as a result of a reduction in utilization of employer-paid health care).[2] This is also taken into account the potential cash-flows.

In table 6.1 financial returns to the government are shown in

1. These premiums, as well as actual land payments made by the government in case of schemes *A* and *B* are generally below the estimated opportunity costs of land (appendix C, section 1.3). In the case of such discrepancies, a redistribution to the disadvantage of landowners takes place. For schemes *A* and *B* landowners are assumed to be in group *IV*. Redistributional costs incurred as a result of imputed government acquisition of land have not been allocated to any particular group.
2. This assumption is based on the prevailing utilization pattern of various types of health care facilities by rehoused and non-rehoused squatter households. See Meade and Wegelin (1975, table 6, p. 55).

TABLE 6.1. Financial returns to the government: Net Present Value (NPV) of actual and potential cash-flows in M$(1973 prices)

Scheme	At discount rates of			
	7%		10%	
	Actual cash-flows	Potential cash-flows	Actual cash-flows	Potential cash-flows
A	−1,121,200	− 805,200	−1,290,400	−1,039,200
B	−1,062,500	− 841,300	−1,214,400	−1,041,900
C	+ 65,900	− 51,300	− 88,300	− 234,100
D	− 598,800	− 282,500	− 662,300	− 421,000
E	− 85,800	+1,038,400	− 509,300	+ 503,500
F	−1,055,200	− 851,500	−1,438,800	−1,288,900

TABLE 6.2. Financial returns to the government: internal rate of return (in %)

Scheme	Actual cash flows	Potential cash flows
A	–[a]	1.9
B	–[a]	1.1
C	8.2	6.3
D	2.2	4.4
E	6.6	16.4
F	4.1	4.6

[a] no positive IRR value.

terms of *NPV* (in the year prior to construction start of actual and potential cash-flows, discounted at the central SDR values of 7% and 10% (see section 5.2). Except for schemes *C* and *E*, NPV's of both actual and potential cash-flows are negative at these SDR values. Except for scheme *C*, NPV's are more favourable in case of potential cash-flows than for actual cash-flows. This is caused by the fact that the combined impact of imputed land costs (for

schemes *C* to *F*) and value increases of cleared lands plus health care utilization benefits is generally positive, except for scheme *C*, where estimated value increases are lower than imputed land costs and no health care utilization benefits accrue to the government. For scheme *E* the reverse applies: imputed land costs based on premiums paid to the state government are low, imputed value increases (which accrue entirely to the government) high, while health care utilization benefits accruing to the government are substantial.

As to the generally negative financial outcome, for schemes *A*, *B* and *C* this is partly the result of low net annual inflows after housing loans have been repaid in full. Actual annual cash inflows are negative for all these three schemes from that point onwards (this is of course also the case during the construction period): annual maintenance and repair costs are higher than quit rents plus assessment rates paid (see appendix C, section 1.4 and 2.2). Due to health care utilization benefits accruing to the government, potential cash-flows show a small positive annual amount after repayment of housing loans for schemes *A* and *B*. In schemes *D* and *F*, it is worth noting that construction costs are higher than necessary and spread widely over time as a result of the bankruptcy of the main contractor. In addition to these specific features, a general conclusion may be that for all schemes except *C* and *E* rents or instalments plus quit rent and assessment rate charges are too low to cover operating costs and at the same time provide a reasonable rate of return to capital. This is confirmed by the internal rates of return (IRR's), as shown in table 6.2.

Judged by the potential cash-flows, scheme *E* is a highly profitable one and scheme *C* marginally so if IRR's are compared with the costs of capital to the government, which fluctuated from $5\frac{3}{4}\%$ to $6\frac{1}{2}\%$ during 1965–1971 (compare table 5.2). If only actual cash-flows are taken into account, the reverse applies.

6.2.3. 'Efficiency' returns

A traditional cost-benefit analysis only takes into account aggregate consumption costs and benefits. If accounting ratios (A.R.) reflect-

ing real scarcities of inputs and outputs are used, such an analysis would yield the 'efficiency' returns of the projects studied.

The results of such an 'efficiency' CBA are provided in table 6.3 below, incorporating all cost and benefit items discussed in appendix C, sections 1 and 2 and the A.R.'s estimated in section 5.3. As shown, only scheme *B* and *F* have a negative NPV_E at the higher SDR level, all other NPV_E's are positive. Consequently, from an efficiency point of view schemes *B* and *F* are marginal cases. Construction costs per unit were highest in these cases (both at market and accounting prices) and this is not offset by a particularly high willingness to pay for those units, while maintenance costs per unit are also rather high.

Estimated switching values at which the NPV becomes zero (IRR's) are substantially higher than the financial IRR's found in table 6.2. Differences are caused mainly by the use of accounting prices (construction costs at accounting prices are approximately 20% below construction costs at market prices – see appendix C, table 1) and by the fact that willingness to pay for housing in all cases was substantially higher (20% to 65%) than rents and instalments paid (appendix C, table 9). Inclusion of externalities made relatively little difference. Schemes which are most successful financially (*C* and *E*) also have highest efficiency rates of return. In both cases the main reason beyond any doubt has been relatively low construction costs per unit (both at market and accounting prices),

TABLE 6.3. Efficiency returns: net present value of aggregate consumption benefits (NPV_E) in M $ at constant 1973 accounting prices and switching values (IRR_E) in %.

Scheme	NPV_E at discount rate of		IRR_E
	7%	10%	
A	1,662,100	593,600	13.2
B	541,900	−281,0000	8.7
C	2,321,100	1,141,300	17.6
D	484,100	121,400	11.6
E	2,132,200	1,236,500	23.5
F	450,900	− 348,100	8.5

while in case of scheme *C* willingness to pay for the units is highest of all schemes, but this is partly offset by relatively high maintenance costs per unit.

6.2.4. National economic returns

In the estimation of efficiency returns in the previous section a dollar's worth of aggregate consumption benefits is worth a dollar, irrespective of to whom it accrues. As discussed at length in section 5.1, in the Malaysian context there is a case for valuing net aggregate consumption benefits accruing to distinct groups in Malaysian society differently. Potential benefit recipients were classified into following four groups:

I. Poor Malays
II. Poor non-Malays
III. Non-poor Malays
IV. Non-poor non-Malays

A dollar of net benefits accruing to each of these groups is to be valued differently by attaching premium redistributional weights α_I to α_{IV} respectively. Net aggregate consumption benefits (efficiency returns) *plus* net benefits accruing to each group multiplied by their respective *premium* weights provides net national economic benefits in any one year (see appendix A, section 3.2), after which NPV's or IRR's can be computed in the usual way.[3]

Central values of premium redistributional weights are provided in tables 5.1 and 5.4. As noted earlier, these quantitative weights are based on qualitative policy statements and planning documents, in which generally only a priority ordering of various target groups is indicated. The weights assumed are consistent with this ordering, but their precise magnitudes are hypothetical (see section 5.1). For that reason it is particularly important (perhaps more than for any

3. Alternatively NPV's of net redistributional benefits to each group may be calculated first, after which multiplication by their premium weight and addition to 'efficiency' NPV's gives national economic NPV. However, if α's vary over time, this is not very practical.

other variable) to indicate how national economic returns are affected by changes in the hypotheses underlying the value of these weights (section 6.2.5).

National economic returns (table 6.4) deviate considerably from efficiency returns for those schemes which substantially benefit group *I* (poor Malays). For schemes contributing relatively little to redistribution in favour of groups *I* and *II*, such as *C* and *F*, national economic returns are only slightly higher than efficiency returns. Judging by their national economic returns, only scheme *F* can be considered marginal, all others being profitable from the national economic point of view.

TABLE 6.4. National economic returns (NPV_N in M$ at 1973 prices and IRR in %).

Scheme	NPV_N at a discount rate of		IRR_N
	7%	10%	
A	3,252,400	1,509,100	16.7
B	1,371,800	268,300	11.2
C	2,282,200	1,175,000	18.5
D	1,096,500	510,500	16.8
E	2,901,300	1,819,200	32.3
F	805,700	−98,700	9.5

6.2.5. Sensitivity analysis

Based on the results of the analysis in the previous sections, it is now possible to judge, with the benefit of hindsight, whether the decision to carry out the housing schemes has been sound. However, a realistic decision rule must be specified first. In view of the discussion on the social rate of discount (SDR) in section 5.2, the following (conservative) decision rule is adopted.

—accept any project having both a positive 'efficiency' net present value (NPV_E) at an SDR of at least 7% and a positive net present value of national economic profits (NPV_N) at a minimum of 10%;
—reject any scheme having a negative NPV_E and/or NPV_N at 7% or below;

—projects having both a positive NPV_E and NPV_N at 7% or above, but a negative NPV_N at 10% are marginal; rejection or acceptance depends on their contribution to the achievement of non-quantitative government aims (section 6.3.2).

According to this rule all schemes appear acceptable except scheme *F*, which is marginal. However, all results presented in the previous sections are based on a number of hypotheses regarding the values of national parameters (chapter 5) and may also critically depend on the magnitude of some quantitatively important cost and benefit items. In the present section the robustness of their results is discussed. In the tables in appendix D it is shown how financial returns, 'efficiency' returns and national economic returns in terms of NPV's at 7% and 10% are affected by changes in values of parameters and variables. An NPV is deemed sensitive if as a result of parameter or variable changes within a specified interval (selected because it provides a range of realistic parameter/variable values), its sign changes. A change in sign of NPV's may affect the choice between acceptance or rejection, in accordance with the above decision rules.

Relevant value ranges of national parameters are shown in table 5.4. Varying accounting ratios over their specified ranges in isolation showed that NPV's are generally not sensitive to such changes in individual A.R.'s (appendix D, table 2). There are only three exceptions to this pattern:

—for scheme *B* the NPV of national economic profits (NPV_N) at 10% is < 0 if the A.R. for unskilled labour is ≥ 0.225. This would make scheme *B* a marginal case;
—for scheme *D* the NPV of 'efficiency' returns (NPV_E) at 10% is < 0 if the A.R. for unskilled labour is ≥ 0.525. This does not influence project decision according to the above decision rule.
—for scheme *F*, NPV_N (10%) > 0, if the A.R. for profits is ≤ 0.75. This would imply clear-cut acceptance of this scheme.

However, this relatively steady picture changes if all A.R.'s are

assumed to change simultaneously from their minimum to their maximum value (appendix D, table 3). Results for schemes *C* and *E* remain insensitive (all NPV's > 0 for all relevant values of A.R.'s), while for all other schemes NPV_N (7%) is also insensitive. At high parameter values NPV_E (10%) becomes negative for schemes *A* and *D*. This does not influence project decision. Schemes *B* and *F* must be rejected at high parameter values, NPV_E (7%) being < 0; at moderate values both are marginal.

The same conclusions are reached if all A.R.'s except that for salaried labour are varied over their respective ranges together with a variation of ±20% of central value for land costs and annual maintenance costs of the schemes[4] (see appendix D, table 4).

An interesting result is obtained (table 6.5) if it is assumed that market prices of project inputs reflect real scarcities correctly, in other words if all A.R.'s are unity. This means that only for variables land costs and willingness to pay for housing services scarcity values are assumed to be higher than actual prices; NPV's and IRR's are considerably lower than those in tables 6.3 and 6.4 respectively. Note that for scheme *C*, IRR_N is lower than the IRR_E: apparently the net redistributional impact under this assumption is

TABLE 6.5 NPV's and IRR's if all A.R.'s are unity (in M$).

Scheme	Efficiency returns			National economic returns		
	NPV_E (7%)	NPV_E (10%)	IRR_E	NPV_N (7%)	NPV_N (10%)	IRR_N
A	678,700	− 199,600	9.1	1,322,600	68,300	10.3
B	− 355,600	−1,018,300	6.0	− 335,200	−1,034,600	6.1
C	1,798,800	731,800	14.3	1,282,400	427,100	12.9
D	166,800	− 154,000	8.3	612,500	129,600	11.4
E	1,664,500	815,900	16.7	2,134,900	1,168,200	20.0
F	− 152,200	− 858,200	6.6	− 89,400	− 810,700	6.8

4. All project outcomes are insensitive to such changes in land costs alone (appendix D, table 2). For scheme *C* financial returns to the government at 7% > 0, if annual maintenance costs incurred by the government decrease by 8% or more; all other outcomes for this scheme and all outcomes for the other schemes are insensitive to variations in annual maintenance costs of ±20%.

negative. According to the above decision rule schemes *B* and *F* would have to be rejected in this case; all other schemes are acceptable.

As noted, none of the schemes' outcomes is sensitive to reasonable variations in imputed scarcity land values (presumably because this is a non-recurring item), but a variation in the willingness to pay for housing (WPH) of ±20% of its cental value provides a more diverse picture (appendix D, table 2). For schemes *A*, *C* and *E* none of the NPV's are sensitive to such changes. Otherwise the result is very much comparable to the outcome for combined changes of A.R.'s: at low WPH values scheme *B* and *F* must be rejected, at moderate values they are marginal.

Finally, an interesting experiment consists of varying utility parameters *e* and *k*, which in conjunction determine values of premium redistributional weights α_I to α_{IV} (section 5.1). Such changes of course only affect NPV_N. Results are encouraging. If *e* is kept at its central value (different for different periods of time, see table 5.4) and *k* is varied from 0.5 to 1.5, all NPV_N's are insensitive to such changes (appendix D, table 2). In the reverse case (*k* at central values and *e* varied from 0.5 to 1.5) only NPV_N (10%) for scheme *F* is sensitive – NPV_N (10%) > 0 if $e \geqq 0.775$. Thus at *e* values of 0.775 or above, this scheme will no longer be marginal. If *e* and *k* are varied in conjunction, the same result appears, but at higher values: NPV_N (10%) for scheme *F* > 0 if $e, k \geqq 0.85$ (see appendix D, table 5).

Summarizing this section, it appears that results are most sensitive to combined changes in A.R.'s for inputs and to changes in WPH. For schemes *B* and *F* such changes, within realistic ranges, are crucial to the decision on these schemes. Projects *A* and *D* show some sensitivity, but because of the decision rule adopted, this is not critical. Schemes *C* and *E* are insensitive to any realistic changes in variables or parameter values. Low values of *e* and *k* do not lead to more schemes being rejected or becoming marginal, but high *e* values do result in the one marginal scheme (*F*) becoming acceptable.

A few words on risk analysis must be added. For future projects

elements of uncertainty normally abound. For that reason this is generally taken into account in CBA according to the procedures outlined in appendix A, section 7. As such, risk analysis is the logical sequel to sensitivity analysis. In case of the housing schemes studied, however, uncertainty only pertains to variables like WPH, maintenance and repair costs, changes of e and k over time and some other minor variables recurring during the schemes' lifetime, whereas items for which the risk factor is of great importance, such as construction costs and construction period, can be discussed with the certainty of hindsight. Of the major recurrent variables mentioned, outcomes are only sensitive to changes in WPH. As it is likely that the current low-income housing shortage (particularly in the Kelang Valley area) will persist for some considerable time (see section 3.2), the likelihood that WPH in real terms will decrease over time is remote. Thus it is felt that an elaborate risk analysis is redundant in the case of the schemes studied.

6.3. MISCELLANEOUS IMPACTS

6.3.1. Complementary government aims

As noted in section 4.2.2, only the schemes' net contribution to aggregate consumption and to interpersonal – as well as to inter-ethnic – redistribution of income have been included in the formal rate of return analysis (see previous section). The present section briefly refers to schemes' impacts on some complementary government aims.

Important complementary aims are aggregate employment generation and the ethnic restructuring of the labour force in accordance with the racial composition of the country's population. Regarding aggregate employment, it has been shown in section 3.3.2 that investment in housing may generate substantial employment in view of its backward linkages. However, this applies to a continuous investment programme, whereas the lasting employment effects of individual housing schemes are small, being limited to maintenance and repair jobs, rent collection, etc. Thus while all schemes studied contribute substantially to increased aggregate consumption,

their contribution to increased aggregate employment is limited. This also implies that such schemes are not very useful as vehicles for restructuring the labour force (in the present context, raising Malay participation in urban employment), firstly because overall permanent employment is limited and secondly because labour employed in the permanent jobs generated by the schemes is already predominantly Malay. Again, matters would be different for an on-going low-income housing construction programme. This would not only give substantial scope for aggregate employment generation, but also would offer large potential benefits of ethnic restructuring of the labour force, since participation ratios of Malays in the urban construction and construction materials industries are quite low.

A distinctly different government objective is that of inter-ethnic wealth redistribution. In view of the indirect government approach to this aim, it is largely complementary to inter-ethnic income redistribution. However, one additional note may be added: the sale of housing units presently rented from the government (as well as, incidentally, legalizing squatter settlements by providing land titles) clearly influences the distribution of wealth directly. This is partly reflected in the differences in the time-pattern of income redistributional effects between hire-purchase and rental schemes (see appendix C, table 12). Home ownership may also stimulate mobilization of savings (section 3.3.6) and thereby increase the extent of assets in the hands of the occupants. However, the extent to which instruments like the sale of housing units or the legalization of squatter settlements can be used to alter the existing inter-ethnic distribution of wealth directly through discriminatory sales practices (or discriminating terms of sale) is uncertain in view of the sensitive nature of such practices.

6.3.2. Effects of racially integrated rehousing

As emphasized throughout the study (particularly in chapter 2) harmonious inter-ethnic relations are vital to development in Malaysia. National unity is the overriding aim of the NEP (see section 2.6.2) and clearly this cannot be achieved unless inter-ethnic

barriers are brought down, not only in the economic sphere, but also socio-psychic barriers such as inter-ethnic attitudes and prejudices. For that reason the impact on inter-ethnic attitudes of rehousing squatters from an ethnically homogeneous area into multi-racial housing schemes is discussed at some length in this section. It is postulated that greater proximity in racially integrated housing schemes leads to increased understanding of and reduced prejudices against other ethnic groups (this implies that, in addition to working and school environments, the domestic environment is thought to be important in influencing attitudes). While it is not intended to belittle the very real religious and cultural differences between the ethnic groups (food habits are a simple example) and the problems that integrated housing may bring because of these differences, it is felt that increased contacts may put these differences in a more realistic perspective.

Some questions pertaining to inter-ethnic issues have been put to household heads of both test and control groups, not only for those multi-racial housing schemes in which occupants originated from ethnically homogeneous areas, but also in case of scheme *D*, in which all occupants were Malay. This last case in that way fulfilled an additional control function.

This section briefly deals with two aspects of rehousing squatters from an ethnically homogeneous area into a racially integrated housing scheme, being actual differences in contact and differences in attitudes towards other ethnic groups. Summarized data for all rehoused interviewed household heads in the five racially integrated schemes and their non-rehoused counterparts are presented below, as well as some comments on particularly salient differences between the individual schemes.

Differences in contact and attitudes can be expected particularly for the children of the households studied. The respondents (only for households with children) were asked whether their children had friends of other races and if so, how they got to know them. Of the rehoused households in the racially mixed schemes 56.5% indicated their children did have friends of other races, compared with a significantly lower figure of 42.9% for their non-rehoused

counterparts. Table 6.6 summarizes the data on how these children became acquainted. It suggests that almost the entire difference between the two percentages above is caused by increased inter-ethnic contacts in the housing environment after rehousing.

It is interesting to observe that for scheme *D* (the only non-integrated housing scheme studied) the percentage of both rehoused and non-rehoused household heads indicating that their children had friends of another race was substantially lower than the average figures above. The data for scheme *D* also confirm the apparent importance of the practice of integrated shooling in getting to know friends of other races as shown in table 6.6 above. In fact, in the case of scheme *D* more than 80% of children who had friends of other races met these friends through school.

Respondents in schemes *A* and *B* were also asked to indicate what types of contact were generated by these friendships with children of other races. Replies to this question (which is literally reproduced) are tabulated in table 6.7. Items 1 to 4 have been formulated to suggest an increasing degree of intensity of contacts. There appears to be some overall difference, indicating that con-

TABLE 6.6. Ways children of interviewed households got to know friends of other races[a]

	Children of:			
	rehoused households		non-rehoused households	
	Absolute	%	Absolute	%
Through work	11	5.7	10	5.9
Through school	77	39.8	85	50.4
Living in the neighbourhood	86	44.6	35	20.7
Through parent's friends	10	5.2	20	11.8
In other ways	9	4.7	19	11.2
Total	193	100.0	169	100.0

[a]More than one reply was possible per household. Differences are highly significant ($p < 0.001$).

TABLE 6.7. Implications of interracial friendships (percentage of households whose children have such friendships).

Does this friendship imply that:		Rehoused Households	Non-rehoused Households
1. Your child(ren) bring(s) these friends to your house more than one a month?	Yes	63.1	38.5
	No	36.9	61.5
2. Your child(ren) go(es) more than once a month to the house of those friends?	Yes	45.2	33.3
	No	54.8	66.7
3. Your child(ren) and these friends go out together regularly (e.g. to play sports, to the cinema or to a show)?	Yes	29.8	33.3
	No	70.2	66.7
4. These friends would occasionally accompany your family in family outings (e.g. picnic)?	Yes	13.1	14.1
	No	86.9	85.9

tacts are somewhat more frequent, at least at lower levels of intensity, for children of rehoused households.[5]

All household heads (also those not having children) were asked how they would feel about their children bringing friends to their house. Replies are tabulated in table 6.8; the statements provided are the ones actually used in the interviews.

As shown, attitudes of rehoused household heads towards their children bringing friends of other ethnic groups to the house is more positive than for the non-rehoused household heads. However, a similar, somewhat smaller difference seems to exist concerning friends of the same race, so the substantial difference in attitudes towards children's friends of other races appears to be partly due to a generally more positive attitude towards their children's friends on the part of the rehoused household heads. It is, moreover, open to doubt how deep-seated these differences in attitude are. When respondents in schemes *A* and *B* were asked to comment on the more delicate and involved question of inter-

5. Differences are highly significant ($p < 0.005$) for item 1, less significant ($p < 0.2$) for item 2 and not significant for items 3 and 4.

TABLE 6.8. Opinion of households heads regarding their children bringing friends to the house (percentage of household heads).

	Friends of own race[a]		Friends of different race[b]	
Statement	Rehoused	Non-rehoused	Rehoused	Non-rehoused
I do not like it and I (would) try to discourage it	1.0	–	2.2	2.5
I do not like it but do/ would not want to interfere.	–	1.3	2.4	1.6
I do not mind.	58.0	65.0	60.4	71.6
I rather like it	13.3	12.3	14.8	10.1
I like it and I (would) try to encourage it.	27.8	21.1	20.2	14.2
Total	317 = 100.0	317 = 100.0	317 = 100.0	317 = 100.0

[a]Differences significant at low confidence level ($p < 0.2$)
[b]Differences significant ($p < 0.05$)

ethnic marriage along similar lines as in table 6.8, no significant differences in replies were found between rehoused and non-rehoused household heads.

The overwhelming majority of the interviewed household heads (more than 80%) reported having friends of other races themselves. Differences in this respect between rehoused and non-rehoused household heads are not significant. In the cases of the three racially integrated housing schemes in greater Kuala Lumpur (*C*, *E* and *F*), respondents were also asked whether they had any objections to having a family of a different ethnic group as their neighbours. The percentage of household heads' objections was low (slightly above 10%) and not significantly different for rehoused and non-rehoused household heads. However it was felt that this question was probably too straightforward to solicit honest replies and for that reason the question was reframed for schemes *A* and *B*, giving five alternative replies from which to choose. Question and

replies are reproduced in table 6.9, and show a significant difference in attitudes between rehoused household heads and non-rehoused ones in this respect.

Concerning all the above indicators, there are of course differences between the schemes. In the case of scheme *F* no favourable differences were discernable and ethnic interaction appeared to be much lower than for all other schemes (except for scheme *D*, where, the scheme not being multi-racial, a low level of interaction could be expected).

Summarizing, it appears that in most cases ethnically integrated rehousing of squatters contributes significantly to increased inter-ethnic tolerance. The fact that no such influence was discernable in the case of 20-storeyed scheme *F* indicates perhaps that this contribution will be lower in the case of housing development in which general social interaction among tenants is relatively low, as seems

TABLE 6.9. Attitudes towards neighbours of a different ethnic group[a]
Question: How would you feel if a family of a different race would come to live next door to you?

	Rehoused		Non-rehoused	
Statement	Absolute	%	Absolute	%
I would not like it at all and would try to avoid contact as much as possible	1	0.8	6	4.9
I would not like it, but I would accept it and allow minimum of contact	4	3.3	9	7.4
I would not mind	88	72.1	93	76.2
I would rather like it and would appreciate possible contacts	11	9.0	6	4.9
I would like it very much and would encourage contacts as much as possible	18	14.8	8	6.6
Total	122	100.0	122	100.0

[a]Differences significant ($p < 0.025$)

to be the case in high-rise flats as compared with low-rise flats and terrace housing development.

6.4. SUMMARY RESULTS OF CASE-STUDY ANALYSIS

In view of the controversy discussed in the introductory sections of this study the most important result from the comprehensive case-study analysis presented in this chapter certainly is that, at least for the schemes studied in urban Peninsular Malaysia, allocating resources to rehousing of squatters has been sound policy both from 'efficiency' and national economic viewpoints. This effectively refutes the categorical contention that allocation of resources to low-income housing should always receive a low priority in development.

Turning to the question of the robustness of this conclusion, a second important result is, that out of the two schemes that are marginal cases on efficiency grounds (*B* and *F*), one (*F*) remains marginal redistributional considerations are also taken into account. Moreover, sensitivity analysis showed that results for these two schemes are quite sensitive to changes in A.R.'s for inputs and to changes in WPH. Actual values of these variables are crucial to the decision whether to accept or reject these schemes. According to the decision rule selected, the four remaining schemes should be accepted without hesitation, irrespective of the value changes of variables and parameters hypothesized in the sensitivity analysis.

The impact of ethnically integrated rehousing schemes on inter-ethnic attitudes has generally been found to be favourable, except for scheme *F*. This, combined with the marginal CBA results found for this scheme, suggests that in retrospect it would have been wiser not to rehouse squatters in multi (20)-storey flats at a central city location close to their pre-rehousing area, but rather rehouse them somewhat further from the centre (where this is possible at lower densities but at the same costs) in types of housing development more conducive to social interaction (provided more favourable results for lower-density housing are not offset by unbearable increases in transport costs to the households concerned).

7. Main conclusions

7.1. SUMMARY REVIEW

Housing conditions, housing needs and housing supply cannot be viewed in isolation from their specific national or even local setting. In urban and rural areas of Peninsular Malaysia, as elsewhere, the housing situation is determined by historical trends in political, social and economic development. Long-term factors influencing particularly the demand side consist of natural population growth, the development of present-day plural population structure, the growth of aggregate income, as well as population (rural-urban) and income distributions. On the supply side, available resources and development strategies, which are both directly related to socio-economic conditions, influence feasible housing solutions.

Housing problems and needs in Peninsular Malaysia are substantial, especially in urban areas, where supply during 1971–75 has not been adequate to prevent such conditions from deteriorating. In rural areas housing problems per se are thought to be less pressing, but upgrading of the existing stock by providing amenities such as piped water, electricity and sanitary facilities is urgently needed. Expected aggregate housing supply during the TMP period, 1976–80, while substantially above SMP levels, is barely sufficient to prevent the housing situation from deteriorating further.

Macroeconomic impacts of investment in housing, while displaying similar tendencies in other countries (for instance the incremental capital-output ratio for housing services as conventionally measured is relatively high in Peninsular Malaysia, as elsewhere), are at the same time strongly influenced by specific local conditions. Particularly the smallness and openness of the Malaysian economy are major factors influencing the magnitude of impacts like income and employment multipliers of investment in housing. Estimates of

such multipliers are high compared with multiplier values for aggregate investment, but lower than estimates for housing investment in most other countries for which such estimates are available.

Similar conclusions apply to the impact of housing investment on the domestic price level and the balance of trade. As all major building materials used in Peninsular Malaysia may be considered tradeables and some, such as timber, are even important export commodities, such impacts are strongly interrelated in the Malaysian case. It is shown that both impacts are influenced considerably by the world commodity market situation. However, while the impact of increased construction demand on the balance of payments is always negative (its extent depending on actual commodity market price levels), domestic price levels are not always adversely affected. Increased housing output is not likely to affect overall rent levels significantly, since annual housing construction is small in proportion to total housing stock and a substantial housing shortage exists.

The possibility of mobilization of savings through housing investment is shown to depend on available financing arrangements and the extent to which home-ownership is thought of as an appealing savings rationale.

Of the various technological housing supply options available, traditional open brick and concrete solutions have been predominant in urban Peninsular Malaysia, while in rural areas timber structures with corrugated metal or thatched roofing prevail. As to public housing approaches in urban areas, these have been dominated by the construction of complete structures (including some rather unsuccessful prefabrication experiments), but also included some site-and-services schemes (which, however, had some serious drawbacks). At present a gradual change in public housing policy towards other 'second-best' solutions, such as upgrading and improvement, provision of infrastructural facilities and legalizing of squatter areas is discernible. However compared to other developing countries, this turning point has come relatively late in Malaysia. This is perhaps not surprising in view of Malaysia's relatively high per capita income and the magnitude of housing

and squatter problems, which are more manageable than in most other South and South-east Asian countries.

Squatting has generally been viewed as a menace rather than as a positive solution of housing problems of the urban poor. Squatting is especially prevalent in the Kelang Valley area. A survey among 2,200 squatter households there indicated that their outstanding features comprised low levels of income, and location at river banks, railway reserves and other waste areas. Their housing problems particularly pertain to lack of legal tenure and concomitant absence of piped water, electricity, adequate sanitation and drainage. Structural housing conditions vary greatly from area to area.

Until recently public response to squatting has been limited to rehousing them in public low-cost housing projects and site-and-service schemes. While rehousing in the housing projects means considerable improvement in housing conditions (apart from security of tenure, availibility of the above amenities constitutes the most important improvement), the low-cost housing programme is quantitatively insufficient and major problems arise concerning rent levels. As to the site-and-services schemes, administrative problems prevented that approach from contributing significantly, while those schemes were generally located too far from employment, educational and other facilities in the absence of adequate public transport.

In view of such problems and of contemplated changes in public housing policy, a detailed cost-benefit appraisal of several rehousing schemes appeared useful. Although it had been intended to include various types of public low-income housing schemes (high and low-density flats and row houses) as well as site-and-services schemes, regrettably lack of sufficient data for the latter precluded this. Consequently the detailed case-study of squatter rehousing schemes has been limited to six traditional projects: three comprising row (terrace) houses, two four-storeyed flat projects and the sixth being a multi-storeyed scheme. These schemes have been evaluated against the aims of the development strategy of the Malaysian Government (the New Economic Policy), utilizing a modified version of the UNIDO (Dasgupta/Sen/Marglin) approach

to cost-benefit analysis. This implies the use of accounting prices and full incorporation of income redistributional aspects.

It has also been attempted to verify the existence of and quantify as much as possible a number of social benefits, which are traditionally used to justify investment in low-income housing improvement (appendix B). Although some such impacts are discernible; notably in the fields of decreased health care utilization, improved performance at work and in school and decreased incidence of fires; an unexpected result related to crime incidences: it is shown that, contrary to popular belief, rehousing of squatters does not contribute much to crime reduction. An additional important aspect is that most of the above social benefits (insofar as they could be estimated) accrue to the rehoused households themselves. Consequently, in a cost-benefit framework, such benefits can be legitimately thought of as already included in their willingness to pay for improved housing; externalities, i.e. benefits accruing to third parties resulting from such improvements, are of limited importance only.

The cost-benefit appraisal shows that only two of the six schemes studied are financially profitable to the government (and one only marginally at that). 'Efficiency' returns are substantially higher: at central values of accounting ratios for inputs, estimated willingness to pay for housing and real land costs, four schemes are highly profitable, with the remaining two schemes being marginally so. When income redistributional impacts are incorporated through differential weights attached to net income accruing to different groups, national economic profits are yet higher: only one scheme remains marginal, having an internal rate of return of 9.5%, all other schemes having rates substantially above the upper (10%) cut-off level. This means that, at least for the schemes studied, rehousing squatters into low-cost housing projects has been sound policy, both from 'efficiency' and national economic viewpoints.

Sensitivity analysis, varying national parameters such as accounting ratios and income redistributional weights as well as values of some quantitatively important variables over realistic intervals, showed that the above results are insensitive to such changes for two

schemes. For two other schemes some sensitivity is found, but in view of the decision rule adopted, this is not critical. For two schemes, simultaneous changes in values of all accounting ratios of inputs and in the value of the willingness to pay for housing are crucial to the decision to accept or to reject them. Results are much less sensitive to changes in value of land costs, maintenance costs and manipulation of income redistributional weights.

The difference between financial and efficiency returns is mainly caused by the willingness to pay for housing being higher than rents and instalments paid. A second factor of importance in causing different rates of return is the overstatement of opportunity costs of non-salaried labour by actual wage rates. These factors not only cause substantial aggregate consumption gains, but also give rise to quantitatively very significant redistributional benefits, explaining yet higher national economic returns. As noted, the impact of externalities as a result of improved housing is discernible, but not important quantitatively.

The high efficiency and national economic returns effectively refute the categorical contention that low-income housing should always receive a low priority in development ('the devil take housing' theory), and clearly call for increased government investment in the field of low-income housing. However, as indicated, these investments would almost always contribute to budgetary deficits, which may affect financing of the schemes. It is believed that this would not form a serious constraint in Malaysia.

Although different physical types of low-income housing schemes have been studied in the present analysis, only a limited insight as to which type would generally offer highest national economic returns can be immediately derived from it. The magnitude of many costs and benefits depends on the specific characteristics of the individual project. Some of these characteristics are clearly related to the physical type of development, but sometimes cause offsetting costs and benefits. For instance, although incidence of crimes in high-rise flats, compare unfavourably with incidences in low-rise flats (appendix B), a high-rise scheme like project *F* enabled squatters from centrally located areas to be relocated near

to their places of work and schools, while residents in the low-rise flats of scheme *E* had to travel much further after rehousing. Some factors are entirely unrelated to the physical type of development: for example, an important contributory factor to relatively low rates of return (both financial and efficiency rates) for schemes *D* and *F* was the long construction period (six years in each case) caused by bankruptcy of the main contractor and re-tendering of the project in both cases. Not only did this lead to higher costs but it also meant that future benefit streams have been more heavily discounted than would otherwise have been the case. Yet a tentative suggestion as to desirable types of housing development in urban Peninsular Malaysia may be offered. It appears that high-rise flats are probably least attractive from efficiency and national economic points of view and also because such schemes are not likely to contribute much to increase inter-racial tolerance. As noted, high-rise scheme *F* is the only multi-racial scheme where no positive influence on inter-racial tolerance with rehousing is discernible.

7.2. GENERALIZATION POSSIBILITIES AND SUGGESTIONS FOR FURTHER RESEARCH

Apart from the fact that the study has shown that it is inappropriate to contend categorically that low-income housing should always receive a low priority in development, it is difficult to generalize from the above results to conditions in other countries. If the present study has shown anything, it is that the specific national or local setting is of great importance to the impact of housing investment generally, as well as to the most appropriate contents of a low-income housing programme. All that may perhaps be said is that, in a country with an abundant supply of unskilled labour and a considerable housing shortage, a programme of low and medium-income housing can hardly fail to have high 'efficiency' returns, provided there is no severe foreign exchange constraint.

Low-income housing schemes also offer substantial scope for

income redistribution by providing housing or infrastructure facilities at charges below estimated willingness to pay. However such redistribution is only efficient if direct income redistribution through the fiscal machinery is insufficiently possible for political or administrative reasons, and if equitable occupants' selection and adequate financing arrangements are ensured. Obviously the extent to which this is possible greatly differs from country to country, depending among other things upon the budgetary position of the government, income levels of the poor and their resulting ability to pay as compared to cost recovery charges. The latter in turn depend on the specific technological contents of the low-income housing programme contemplated.

A low-income housing programme may contain a wide range of completed housing options as well as a number of 'second-best' options. The study has made clear that, at least in the urban Malaysian setting, all options studied have advantages and drawbacks. The only general suggestion that can be made is, that in a package containing an otherwise preferably as wide a range of options as possible, multi-storey development as well as so called industrialized building systems should be avoided. Only when considerations of land saving or avoidance of substantial transport costs of those rehoused critically hinge on such housing provision should multi-storey development be undertaken. Industrialized building systems are only admissible if they economize on those resources generally scarce in developing countries: foreign exchange, organizational and entrepreneurial capacities, professional and skilled labour. This, unfortunately, is seldom the case.

Especially in poor countries facing severe constraints of foreign exchange availability and government fund-raising capacity, traditional housing options like the Malaysian case-studies may not be feasible. Since, moreover, in many developing countries the urban poor are substantially poorer than the Malaysian urban poor, the alternative left in such cases for a low-income housing programme is a combination of financially viable second-best options. However it must be stressed that such options generally lay a heavy claim on organizational and co-ordinating capacities of those in-

stitutions and individuals involved, to a much larger extent than for 'regular' housing schemes. As such capacities are generally scarce, this may be a crucial problem.

Thus, generalization possibilities of the results of the analysis are somewhat limited. Regarding the method of analysis the outlook is more optimistic. In the Malaysian setting two important ways of providing improved housing for urban squatters have not been analysed in the present study; both of these should also be subjected to a CBA before more definite comments on the usefulness of different ways of rehousing are appropriate. As noted above, none of the existing site-and-service squatter resettlement schemes could be incorporated in the analysis for lack of data. The second approach not included consists of upgrading of squatter areas (where this is physically possible) by providing infrastructure like proper roads and drains, piped water and electricity. To the knowledge of the present writer this approach has not been tried on any substantial scale in urban areas in Peninsular Malaysia and therefore could not be included in the present, essentially retrospective, analysis. A pilot project along these lines is presently being carried out. An evaluation of such a pilot scheme, as well as analysis of the site-and-service squatter resettlement schemes along similar lines as the present study offer potentially very fruitful areas of research in the field of urban low-income housing in Malaysia, as well as elsewhere.

Other useful areas for study would be an analysis of housing policy issues and an evaluation of the existing housing delivery system. To date existing housing policies in Malaysia appear to be compartmentalized, pertaining only to segments of the housing market. No clear overall policy exists related to specific national goals in the field of housing. Consequently it is not clear if housing provision should solely be viewed as instrumental to the achievement of NEP aims (as has been assumed in the present study) or if specific housing targets assume any importance. The absence of a clear-cut overall housing policy is also reflected in half-hearted co-operation and weak co-ordination of activities of the various institutions responsible for the provision of housing, infrastructural facilities and land titles. Design of a comprehensive housing policy

and systematic evaluation of the present housing delivery system, related to the institutional requirements of such a policy, seem badly needed. At any rate improvements in the areas of demarcation of responsibilities and the hierarchical structure of co-operation are essential if 'second-best' housing solutions currently contemplated are to be carried out with any degree of success.

Appendices

Appendix A. A survey of cost-benefit analysis

A.1. INTRODUCTION

The literature on Cost-Benefit Analysis (CBA) has expanded considerably over the last few years. Until the mid-sixties discussions on this tool of analysis were mainly held by welfare economists and its application was not generally practiced. At present the term 'Cost-Benefit Analysis' is familiar to almost anyone who is in one way or another involved in project appraisal in the public sector. This can be attributed at least in part to the rapidly growing literature on the subject and particularly to the increasing number of case-studies carried out.[1] In view of this abundance of literature and the empirical nature of the present study, only a brief survey of the general methodology of CBA will be presented in this appendix. Methodological issues more specifically related to the Malaysian case studies are discussed in chapters 4 and 5. As noted in section 4.2.1, the presentation in the next sections relates particularly to the CBA approaches especially developed for use in developing countries recently by Little and Mirrless[2] and by P. Dasgupta, Sen and Marglin (see UNIDO, 1972; and Hansen, 1973).

In the next section the concept of and rationale for CBA will be outlined briefly, followed by a discussion on the multiplicity of

1. Recent examples of comprehensive texts on the general methodology of CBA – while differing in emphasis – are: A. K. Dasgupta and Pearce (1972), Lesourne (1975), and Mishan (1975). A discussion of some controversial theoretical issues as well as numerous case-studies can be found e.g. in the Aldine annuals on Benefit-Cost and Policy Analysis (1971 to 1974).
2. Initially for the OECD Development Centre, see Little and Mirrlees (1968). A successor volume was published in 1974, substantially altered as a result of the experience with case-study applications of the Little-Mirrlees approach and the critical comments on the earlier publication. See Little and Mirrlees (1974). Extensive comment can be found in the February, 1972 (Vol. 34, no. 1) issue of the *Bulletin of the Oxford University Institute of Economics and Statistics*.

government objectives and how costs and benefits related to these objectives should be taken into account in CBA. Section 4 describes the overall CBA framework and highlights some general measurement problems, while section 5 discusses measurement of individual costs and benefits in greater detail, touching on the estimation of shadow-prices. Section 6 addresses the considerations governing the choice of the SDR. This is followed by a discussion on how to allow for uncertainty in project appraisal. Section 8 compares the comprehensive Little-Mirrlees/UNIDO approach to CBA discussed so far with some short-cut methods available. The next section discusses the problems and limitations inherent in CBA, while section 10 more specifically concerns one of these problems, namely how CBA could be integrated in national planning.

A.2. CONCEPT OF AND RATIONALE FOR CBA

The allocation of scarce resources is of major importance for any economic entity, be it private enterprise or a public body. Using these resources in one direction precludes their use in another. In allocating them in such a way that a maximum contribution in terms of the organization's objectives is achieved, it is ensured that these limited resources are put to their best possible use. CBA is a systematic method of facilitating the choices necessary. It assesses the desirability of projects or activities from the point of view of the interests of society. In present day reality this society is almost always the nation-state. In other words, CBA is nothing more than a project appraisal or profitability analysis in which not the project's costs (expenditures) and benefits (revenue) to a private commercial entrepreneur will be taken into account, but the project's costs and benefits to the nation. The basic framework of CBA is not essentially different from that in the Discounted Cash Flow (DCF) profitability analysis used in commercial project appraisals, but the differences between those types of analysis are caused by differences between the objectives of a private entrepreneur and those of a nation. A private entrepreneur's objective is to maximize his

own profits, either in the short or the long run. The government, in setting goals for the nation, is usually not so much concerned with maximizing its own net revenue. In trying to combat poverty, or more generally, raise the standard of living of the nation's population, it seeks to achieve a number of socio-economic objectives, in which pursuit it would sometimes deliberately create a deficit in its budget. It follows that certain commercially profitable ventures could possibly be undesirable in view of the national objectives, whereas other projects that are unprofitable commercially, may be beneficial to the nation.[3]

Two important differences between national economic profitability analysis (CBA) and commercial profitability analysis resulting from such differences in objectives may be distinguished:

—Firstly, the value or price attached to some of the items included in the profitability analysis may be different. A private entrepreneur generally has to accept prices as determined by market forces, both for his inputs and for his outputs. In a CBA, the prices of these inputs and outputs should reflect the social value that these goods or services represent to the nation. These values do not necessarily coincide with market prices. (see section 5 below).

—A second difference between CBA and commercial profitability analysis caused by the difference in objectives is the fact that there may be some costs or benefits related to a project which entail no expenditure or revenue to the private entrepreneur, but which constitute a sizeable impact on the nation in the sense that costs are incurred or benefits reaped in terms of one or more of the nation's objectives. Two different aspects are important here: obviously, where objectives differ between a private entrepreneur and the government, costs and benefits in terms of government objectives that are irrelevant to the former are not taken into

3. It is implied throughout the discussion that resource allocation (and thus project appraisal) is used as an instrument to achieve government objectives in addition to the more traditional instruments of monetary and fiscal policy.

account in a private profitability analysis, even though the direct beneficiaries of the project are affected. Secondly, one may think of the so-called 'externalities': a third party or the nation at large is affected by the project, but the project is not compensated for or required to pay for the benefits or costs it inflicts.

In view of these differences it is clear that a commercial profitability analysis insufficiently accounts for the 'social value' of a project to the nation. How a commercial appraisal should be adjusted to form a CBA will be taken up in the next sections. From the national point of view all investment projects should be evaluated with the aid of CBA methodology. However since the government has less influence over private sector investment decisions than over those in the public sector, it is understandable that for practical reasons its main field of application lies in the appraisal of public sector projects.

A.3. GOVERNMENT POLICY OBJECTIVES AND NATIONAL ECONOMIC PROFITABILITY

The previous paragraph emphasized the need for CBA because of a difference between commercial and national economic profitability caused by differences in objectives between a private entrepreneur and the government (embodying the interests of the nation). This leads to the question of whether it is possible to design a single measure for national economic profitability in such a way that the multiplicity of government objectives can be accommodated satisfactorily. In order to answer this question, a discussion of government objectives that appear to be common to most governments today is in order (see Little and Mirrlees, 1974, pp. 48–65; UNIDO, 1972, pp. 27–33):

A.3.1. Aggregate consumption

It is reasonable to assume that a government's ultimate objective is to raise the standard of living of its subjects. A major aspect of this

is the overall availability of goods and services to the nation, as measured by the level of aggregate consumption (the objective to raise the national income is derived from this, since a high national income would enable the nation to enjoy a high level of aggregate consumption). The aggregate consumption objective by its nature raises some measurement problems:

—Consumption takes place over time. It is therefore necessary to compare present and future consumption in order to measure correctly the present value of the net contribution to the aggregate consumption objective generated by a project over time. This implies that weights[4] must be attached to present consumption, consumption taking place next year, the year after that, etc., until no more net contributions (either positive or negative) to aggregate consumption are generated by the project. Generally, these weights will be deemed to become smaller when contributions to net aggregate consumption are further away in time. The rate by which these weights fall over time is called the social rate of discount (SDR) or the consumption rate of interest. The considerations governing the choice of this rate are a matter of considerable debate among economists (see section 2.6 below, and also UNIDO, 1972, pp. 154–172; and Little and Mirrlees, 1974, pp. 282–297). For practical purposes, it is often assumed that the rate will be set (implicitly or explicitly) by the government.

—A second problem of measurement lies in the fact that aggregate consumption is a heterogeneous entity consisting of quantities of many goods and services that have to be converted into one homogeneous measure. The conversion factors most commonly used for this aggregation are the prices of the various goods. As mentioned, where market prices can be deemed to deviate substantially from 'social values', corrected prices should be used.

4. Following UNIDO (1972, p. 139) a distinction is made here between shadow-prices and weights. The term weights refers to those national parameters that directly reflect political value judgements, such as the SDR and the relative importance of costs and benefits related to the various government objectives. Shadow-prices reflect resource constraints resulting from market imperfections.

These are called 'accounting' or 'shadow' prices. Measurement problems in this respect are discussed in section 5 below.

—Thirdly, aggregate consumption also means that consumption gains or losses of all individuals will simply be added.[5] Obviously it is not equitable simply to add consumption of individuals of vastly different income levels and one could argue that proper weights should be applied to take these differences into account. This is not an easy correction to perform in practice and it may be more convenient and clearer from the point of view of delineating government objectives to consider these aspects separately (see below).

A.3.2. Income redistribution

Next to the objective to raise aggregate consumption, redistribution of income to certain groups or regions within the nation is almost invariably an important government objective. Actually, income distributional matters cannot be separated from aggregate consumption, since this aggregate embodies implied equal weights for each individual group or region's consumption. Moreover, both prices and quantities of goods and services incorporated in aggregate consumption are influenced by the distribution of income, since this distribution influences demand, which in turn influences market prices and quantities consumed.

Possibilities of incorporating redistributional considerations into CBA have received considerable attention in the literature recently.[6] Since the proposals put forward are also of relevance to the incorporation of costs and benefits related to other government objectives these attempts will be discussed at some length.

First of all it should be noted that one school of thought holds that costs and benefits included in a CBA should be related to aggre-

5. In fact, a CBA taking into account costs and benefits in terms of aggregate consumption only employs the traditional Hicks-Kaldor welfare criterion, which accepts a project if the gainers could compensate the losers (potential Pareto improvement). See Layard (1972, pp. 15–16), Mishan (1975, pp. 390–402).

6. See e.g. Neenan (1971), Lal (1972a and 1974, pp. 40–44), Sadowski (1973), Nwaneri (1973), Weisbrod (1968), Squire and van der Tak (1975, pp. 49–77, 101–117), Schneider (1975) and Helmers (1977).

gate consumption only and the project's impact on other objectives stated separately.[7] It is felt that in such a way a CBA is based on welfare economic principles proper: the calculation of gains and losses is based only on the valuations of the beneficiaries of the projects and not on political preferences. In this view, to include redistributional costs and benefits would possibly mislead the public into thinking that the resulting appraisal is the result of pure economic considerations alone. For that reason the procedure advocated is: calculate the 'efficiency' rate of return, state and possibly quantify the project's impact on other objectives and let public debate on the proposal run its course.[8]

However, as mentioned above, distributional weights are implied in the aggregate, since under the Hicks-Kaldor criterion the gainers do not actually compensate the losers, but are only assumed to be able to do so. This means that interpersonal comparisons of the value of each man's gains or losses have to be made. Moreover, simply to state the distributional impact and then hope for the best is not likely to promote consistent project selection in line with overall government priorities.

To ensure such consistency, it is required that distributional considerations assume equal importance in all project appraisals carried out (allowing, however, for changes in importance of objectives over time). This entails systematic and explicit use of distributional weights in CBA. Ideally such weights should be derived from a social welfare function, specifying the marginal social utility of consumption at all levels of consumption. Assuming such a function and the value of its parameters, a statement of the value of the consumption distribution weight at various levels of consumption could be made.[9] However, at a general level of discussion one can prob-

7. See e.g. Harberger (1971), Mishan (1974, and 1975, pp. 392 ff). See also Musgrave (1969, pp. 803–805), who generally favours non-inclusion of distribution considerations but carefully outlines a number of exceptions where inclusion may be admissible in his view.
8. Mishan (1974, pp. 90–91). This is comparable to the approach suggested by Prou and Chervel. See section 2.8.4 below and e.g. Chervel (1973a and 1973b).
9. See e.g. Squire and van der Tak (1975, pp. 63–67), Lal (1972a, pp. 3–7, and 1974, pp. 41–43), Little and Mirrlees (1974, pp. 234–242), Chenery et al. (1974, pp. 38–51 and p. 206).

ably say not much more than that nearly everybody would agree that the marginal social utility of consumption declines (or at least does not increase) with increasing consumption levels. Even in specific cases it is difficult to go beyond this. Several attempts have been made (see Sadowski, 1973, pp. 216–224 for a useful overview). One possibility is to look at project decisions taken in the past (see Weisbrod, 1968; and Neenan, 1971). The obvious problem inherent in this method is that it presupposes consistency in past decisions, which is unlikely to be the case: the very goal of the exercise is precisely to set explicit weights in order to be more consistent! An alternative approach uses the prevailing income-tax structure to derive the implicit marginal social utility of various consumption levels (see e.g. Nwaneri, 1973). This has a disadvantage that a number of additional assumptions will have to be made which may be unrealistic, notably with reference to poor countries, where only a low percentage of income earners is liable to income tax.

Finally one may attempt to derive the weights by a more direct approach to the policy maker. However, this again taxes the behaviour of the policy maker: it is not very realistic to expect a government to commit itself explicitly to a quantitative expression of these weights. Desirable though this would be from the point of view of project appraisal, many governments would probably feel that this would limit their political flexibility and weaken their chances of political survival. Yet, to start with, one might analyse policy statements, development plan documents, or, more generally, in the prevailing political climate try to sense the relative priorities of various objectives. One may then ideally (but perhaps not very realistically too) envisage an iterative dialogue between the policy maker 'at the top' and the planners 'at the bottom', during which a number of projects or variants of a project are discussed, including the impact that accepting or rejecting these variants has on the weights implied.[10] In this procedure various ways of

10. This is the approach advocated by UNIDO (1972, pp. 135–149). However, according to Schneider (1975, p. 17) it will be difficult if not impossible in many cases to apply such a procedure under "real world" conditions. For that reason he favours the slightly

presentation may be used: the most logical way would be to weigh explicitly the consumption of each target group distinguished separately before adding up net benefits. However, a simpler way (but amounting to the same end result) would be to add to the net aggregate consumption benefits the consumption gains or losses of the target groups or regions, multiplied by each group's additional 'premium' weight vis-à-vis aggregate consumption (see Hansen, 1973, pp. 46–48). This has the advantage that the 'efficiency' and 'distributional' aspects of the project are clearly separated and that the impact on other relevant objectives can easily be incorporated along similar lines. Finally, another possible way to attach distributional weights more implicitly consists of allowing for distributional impacts in the shadow wage rate (Little and Mirrlees, 1974, pp. 55–60, 239). This, however, omits distributional impacts unrelated to employing low paid labour (ibid., p. 57). Moreover, it places a heavy emphasis on the value judgements of the analyst and complicates the discussion with the policy maker.

A.3.3. Employment

Generally, employment figures high on the list of government objectives, chiefly because of its impact on aggregate consumption and the distribution of consumption. If this is the only reason for attaching a high value to employment, then it is complementary to these objectives and additional inclusion of the employment effects in a CBA would amount to double-counting (only if costs and benefits related to *both* other objectives are taken into account).

However, employment may be thought desirable for other reasons:

A. for its own sake – work is thought to be intrinsically good;

Footnote 10 (continued)

different procedure of maximizing one objective, while setting all other objectives as constraints. Admittedly, this provides the policy maker with a little leeway in specifying a quantitative expression of weights, but it is more rigid in the sense that, if one of the constraints is not met, the project will be rejected forthright and no trade-off between objectives is possible.

B. because unemployment is thought to be demoralizing and an affront to human dignity; or
C. because the government wants to minimize the potential threat of social and political tensions caused by widespread unemployment (which would be aggravated by an apparent government insensitivity to the problem).

Only in such or similar cases should reduction of unemployment be included as a separate objective in CBA (compare e.g. Stewart and Streeten, 1971, notably pp. 151–153; Little and Mirrlees, 1974, pp. 60–62; UNIDO, 1972, p. 32 and pp. 85–98). The earlier mentioned difficulties related to attaching the proper weight to this objective would then arise.

A.3.4. Economic independence

This objective, which assumes some importance as a government aim in a number of countries, can be interpreted in many ways, including the following:

A. independence of foreign aid (especially in view of debt problems arising out of non-grant aid);
B. pure overall autarchy (self-reliance);
C. self-sufficiency in specific capital or consumer goods, such as steel, oil, food, motor cars, etc., in order to provide protection against a sharp drop in imports of those goods considered essential;
D. to eliminate a balance of payments or balance of trade deficit (ignoring balancing transactions necessary to achieve an ex post facto balance).

To the extent that these considerations are thought important for their own sake, they should be taken into account as separate objectives in the analysis. However it appears reasonable to assume that in many cases these goals are persued as means to raise the level of aggregate consumption and to achieve a more equitable distribution of consumption, rather than for their own sake. This most

clearly applies to D: "... a balance of payments surplus is no advantage in itself. No one would mind running a deficit forever, if that were possible!" (Little and Mirrlees, 1974, p. 60).

A.3.5. National income growth

Although the growth rate of the national income is often treated as an important policy objective, it is felt that this rate should not figure in national economic profitability. Since the entire future consumption stream has already been taken into account in the aggregate consumption objective, to include the growth rate of national income as a separate objective would only mean to attach a larger weight to future consumption, unless growth rates are pursued by the government for their own sake, which is highly unlikely (different valuation of investment is allowed for in the shadow-price of investment, see section 5.2 below).

A.3.6. Other objectives

A host of other objectives more particularly related to a single region or country rather than being common to most countries, could be singled out for discussion. It does not appear to be particularly fruitful to do so here. In the main text of this study (sections 2.6, 4.2.2 and 5.1). Malaysian government objectives are discussed. Attention is given, among other things, to aims that are relevant in the Malaysian context (and perhaps could be of interest to other multi-racial societies), but the world-wide importance of these is doubtful. Some of these aims are less tangible than the ones discussed above. Their intangible nature does not make them a priori less important than more tangible objectives, but compounds the problem of how to incorporate all objectives into one aggregate measure of national economic profitability. This question will be taken up next.

A.3.7. The problem of weights

Once all costs and benefits relating to the various relevant objectives have been identified and quantified as much as possible, the problem of attaching the proper weight to these items arises. From the

above it would seem that in most cases only the objective of aggregate consumption and distributional considerations are important. However in cases where other objectives must be taken into account, an additional problem could arise: costs and benefits related to different objectives may be expressed in different types of quantitative measures. How to compare $\$X$ millions of aggregate consumption with Y thousand man-years of additional employment? In such cases equivalents must be found to convert these different measures into one set of units. These can be found by answering the question: how many units of benefit type A are as important to the nation as one unit of benefit B, e.g. how many dollars of aggregate consumption is one more employed worker worth to the country? By solving this question, the weighing of objectives and the problem of different units of measurement could be solved in one step.[11]

Suppose (choosing one unit of benefit type 1 as the unit of account) that one unit of type 1 is equivalent to a_2 units of type 2, a_3 units of type 3 and so on to a_x units of type x. Then the aggregate annual benefits accruing from a particular project are equal to:

$$\sum_{i=1}^{x} a_i B_i, \text{ in which } a_1 = 1 \text{ and } B_1, B_2, \ldots B_x \text{ the amounts of}$$

benefits type 1, 2, ... x generated by the project, each expressed in its original units.

Obviously, the setting of the a_i's is essentially an act of policy, because trade-offs are involved between often conflicting objectives.

A.4. THE CBA FRAMEWORK

The CBA framework provided below is an ideal one. It is often not possible to incorporate all relevant costs and benefits as neatly as

11. See also McGaughey and Thorbecke (1972) and the ensuing comment by Hyslop (1973) for a similar, slightly different solution to weighing the various objectives and different units of measurement.

one would wish. However, ideally it should be possible to express all costs and benefits in one figure to be derived according to the following formula:

$$B_p = \sum_{i=1}^{x} a_i \sum_{t=0}^{n} \frac{B_{it}}{(1+r)^t},$$

where B_p = present value of total net benefits[12] (present value of national economic profits) that are generated by the project, valued in the unit of account of numeraire chosen;

B_{it} = undiscounted value of total net benefits of type $i (i = 1, 2 \ldots x)$, accruing in year $t (t = 0, 1, 2 \ldots n)$, expressed in its original units of measurement;

a_i = the equivalent weight used to convert net benefits of type i to the unit of account chosen;[13]

x = number of benefit types;

n = lifetime of project in years;

r = social rate of discount (see section 6).

The building blocks of the above formula are the individual gross costs and benefits of each relevant type related to the project in each year of its economic lifespan. Each type of net benefits is related to one of the objectives distinguished. Within each type it is often possible to identify a number of rather separate items, depending on its beneficiaries (sufferers) or on its remoteness to the project. This raises the question of which costs and benefits should be included. Obviously, cost and benefit items related to low-priority objectives need not be included. Similarly, items that appear to be rather remote to the project, or that are likely to have

12. Costs are viewed as negative benefits thoughout this presentation.

13. If the policy maker anticipates that the relative weights between the various objectives will change over time, the above formula becomes

$$B_p = \sum_{i=1}^{x} \sum_{t=0}^{n} \frac{a_{it} \cdot B_{it}}{(1+r)^t}.$$

a very small impact, can be ignored safely. Concerning both these cases an appropriate cut-off point will have to be determined. Although generally this should not be very difficult, one caveat is in order: especially in social projects, externalities could be quite an important part of total costs and benefits, but often pose rather difficult measurement problems. Sometimes a fair amount of primary data collection is necessary to obtain some quantitative measure of these externalities. This should not discourage the analyst from taking them into consideration unless he has good reasons to believe that the quantitative mistake he would make by ignoring them is very small. The Little-Mirrlees study and the UNIDO guidelines are both concerned with industrial projects, where it is generally assumed that externalities are not very important quantitatively (although this assumption is questionable, especially in view of the present concern over industrial pollution, generating external costs). Consequently, both works treat the topic very cursorily (Little and Mirrlees, 1974, pp. 335–349; UNIDO, 1972, pp. 64–66). A more elaborate discussion can for instance be found in Mishan (1975, pp. 109–164).

Before discussing more detailed measurement problems, two more general matters should be dispensed with: the choice of the unit of account or numeraire to be used and the treatment of inflation. The UNIDO guidelines use 'aggregate consumption at domestic prices', as the numeraire, whereas Little and Mirrlees use 'uncommitted social income, measured in terms of convertible foreign exchange'. In principle the choice of unit of account does not make any difference in the evaluation and is largely a matter of convenience (see e.g. P. Dasgupta, 1972a and 1972b, Little and Mirrlees, 1974, pp. 145–151, 358–361). Using the Little–Mirrlees numeraire requires estimation of the standard conversion factor, rather than measurement of the shadow rate of foreign exchange (its reciprocal; see Little and Mirrlees, 1974, pp. 218–219). The shadow-prices of all goods take possible foreign exchange constraints into account and this amounts to an implicit shadow foreign exchange rate. Compared to 'a unit of aggregate consumption at domestic prices' the concept of 'a unit of uncommitted social in-

come in terms of convertible foreign exchange' appears to be the more complicated of the two. In addition to this, the raising of the level of aggregate consumption is almost always one of the most important policy objectives. To use aggregate consumption as the numeraire is therefore intuitively appealing as it is likely to lead to less confusion in discussions with the policy maker. Based on these considerations of convenience, aggregate consumption at domestic prices is used as the unit of account throughout this study. Consequently the following sections draw heavily on the UNIDO guidelines.

To account for inflation in project appraisal, too, is largely a matter of convenience. If costs and benefits incurred and accruing over time are expressed in constant prices, this implies that the social rate of discount (SDR) applied should also be a 'real' rate. If costs and benefits are expressed in current prices, a nominal rate of discount should be used. In most cases it will be easiest to use constant prices, since in that case it is not necessary to estimate the expected future rate of inflation (as is shown in section 6, the SDR, in real terms, is essentially based on a value judgement by the policy maker and need not be derived from a nominal capital market state). However, for an expost evaluation it may be more convenient to use current prices and to adjust the SDR in real terms. This can be done in an approximate way by adding to the percentage points of the 'real' SDR the percentage points of the average annual level of inflation (provided the real SDR and the rate of inflation are not unreasonably high this is a fairly accurate approximation.[14] In both approaches the effect of inflation is taken into account, either through correcting annual net benefits or through adjusting the SDR. Since project appraisal deals with the use of real resources, overall inflation should not make any difference to the result. However changes in relative prices certainly do, since such price changes reflect real shifts in the value of inputs and outputs of the project to the economy.

14. Treatment of inflation in project evaluation is generally discussed very cursorily (if at all) in the literature. For an analysis of the issues involved, see Hanke et al. (1975).

A.5. MEASUREMENT OF COSTS AND BENEFITS

A.5.1. Aggregate consumption objective: valuation of project outputs and inputs

A.5.1.1. Project outputs

Aggregate consumption benefits are measured by the ultimate consumers' willingness to pay for the 'net output' of the project. This 'net output' is constituted by the goods or services made available to the economy that would not have been available in the absence of the project. In this respect there are three possibilities:

A. the project physically adds to the availability of these goods or services to the economy. In this case the physical output of the project is equivalent to the 'net output'.
B. the project's physical output substitutes for an alternative source of supply elsewhere in the economy. In this case total supply remains at the same level and 'net output' consists of the resources released from the alternative source of supply.
C. the project's physical output is exported or substitutes for imports. In this case the 'net output' of the project consists of the foreign exchange generated or saved.

In case A, a distinction should be made between consumer goods and producer goods. In the case of benefits from consumer goods, the willingness to pay is reflected in the market price if conditions of competitive buying (no rationing and no monopsony power)[15] prevail and if project output does not change the market price. Since conditions of competitive buying do not always fully exist, actual prices may have to be corrected upwards. Potential market-clearing price in the absence of obstacles to conditions of competitive buying will have to be estimated. Where project output affects (lowers) market price, the willingness to pay can be approximated

15. Whether conditions of competitive selling prevail is irrelevant in establishing the 'willingness to pay' for consumer goods, since even if the particular good is sold at a monopoly price, the public is apparently willing to pay that price.

by: (new price per unit) × (physical output of the project) + ½(old price − new price) × (physical output). This is equivalent to the market price of the output produced by the project plus a linear interpolation estimate of the consumer's surplus. A more difficult case arises when the output of the project is not sold in the market at all (which may happen, e.g. in the field of educational and medical services, housing and infrastructural facilities). In that case a direct evaluation based on the importance the community attaches to the availability of these goods or services will have to be carried out. One approach would be to try to establish the price consumers would have been willing to pay had these goods or services not been free. This is no easy task and may involve some additional value judgements by the analyst. Moreover, it should be noted that this approach is hardly feasible where the project's output consists of pure public goods or services, such as civil and criminal justice or defence, which due to the nature of these services, cannot be supplied through the market mechanism. In such cases one can do no better than applying cost-effectiveness techniques, possibly complemented by ranking of technical properties of the alternatives considered by experts' panels.

In the case of a producer good, the producers' willingness to pay may be taken as a first approximation of its value to consumers. The market price will only reflect this willingness if conditions of competitive buying exist in the market, if a change in supply of the producer good does not change its price and if the producer concerned has no monopoly power on the market for his output (which would imply that his willingness to pay for the producer good would be underestimated by its market price). The willingness to pay on the part of the producers is an adequate measure of the value of the producer good to the consumers only if the following two conditions hold: first, in all markets between the purchaser of the producer good and the final consumer, departures from conditions of competitive buying and selling are non-existent, and second, supply of the producer good has no impact on prices further along the line. If this does happen, producers' willingness to pay underestimates the full consumption benefits and must be supplemented by the

excess in subsequent purchasers' willingness to pay over and above their actual payments (along similar lines as for consumer goods, see above).

In case B the project's net output consists of resources released elsewhere in the economy, including primary production factors (labour, capital and land), tradeable goods and services (i.e. goods that are actually imported, or exported, deflect potential imports or exports or cause additional imports or exports elsewhere in the economy) and non-tradeable goods and services. Similar to the treatment of inputs of the project itself, as will be discussed below, resources released elsewhere must be valued at the consumers' willingness to pay for these resources in their next best alternative use foregone.

In case C, 'net output' consist of the foreign exchange generated or saved. This should be valued at the domestic consumers' willingness to pay for foreign exchange.

In practice a combination of A, B and C is likely to exist: for instance, even in the case of a project producing entirely for the export market, part of the project's output will still consist of local transport margins.

A.5.1.2. Project inputs

In terms of the aggregate consumption objective, the appropriate concept of costs is that of alternative benefits foregone, in other words of opportunity costs. This means that costs will be measured, very much in the same way as benefits, according to the criterion of the consumers' willingness to pay. The costs of a project consist of its 'net input', being the goods and services withdrawn from the rest of the economy that would not have been withdrawn in the absence of the project. Again, these inputs may be primary factors of production, tradeable goods (see 5.1.1) and non-tradeables. While primary production factors and tradeable goods can be valued straight away, non-tradeable goods may have to be further analysed as to their contents of primary factors, tradeables and non-tradeables depending on overall supply effects in the economy

caused by the increased demand for these non-tradeables. Except for the fact that in identifying and valuing the various inputs consumer goods do not play a part, the procedure of estimating costs is very similar to that of estimating benefits as outlined above. Again three positions are possible:

A. the project reduces the availability of the physical inputs to the rest of the economy. In this case the 'net input' consists of the value of output produced by these physical inputs in the alternative use foregone as measured by the consumers' willingness to pay for that output.
B. the project's demand for physical inputs gives rise to increased domestic production of these inputs. 'Net input' then consists of the production costs of this increase in supply. This means that the willingness to pay for the inputs used in supply expansion (i.e. one round further back in the input-output chain) has to be determined.
C. the project's demand for inputs gives rise to increased imports or decreased exports and the 'net input' is the foreign exchange used, valued at its domestic willingness to pay.

A.5.1.3. Accounting prices

If valuation of inputs (costs) and outputs (benefits) implies a deviation from market prices this means that so-called shadow or accounting prices[16] must be estimated. This applies to primary factors of production, tradeables as well as non-tradeables, which are discussed in turn below.

A.5.1.3.1. Labour

In the case of labour one should distinguish between unskilled and skilled labour. In contrast to the former, supply of the latter type of labour may be augmented by appropriate investments in educa-

16. In practice it is often more convenient to calculate the accounting ratio, i.e. the ratio of the accounting price over the market price.

tion. Moreover, while immigration of skilled labour is quite likely in the case of acute domestic shortages, this is not likely to happen with unskilled labour in a labour-surplus economy. Skills are often in short supply in the face of substantial unemployment and underemployment and for this reason it is not unreasonable to take the market wage rate for skilled labour as a first approximation of the willingness to pay for this kind of labour. However, in view of the non-competitiveness of the labour market, the opportunity costs of skilled labour may sometimes be more correctly estimated by the estimated costs of training required to acquire the skills concerned plus the opportunity costs of unskilled labour.

These costs of unskilled labour primarily consist of the value of such labour withdrawn from the rest of the economy as a consequence of the project. In the case of substantial unemployment and underemployment combined with institutional rigidities in the determination of wage levels for unskilled labour in the modern sectors of the economy, this value is likely to differ substantially from the market wage rate. As a starting point, a hypothesis as to the ultimate source of unskilled labour used by the project is essential: for example, the value of the labour foregone elsewhere is likely to be different if it can be assumed that employment of unskilled labour by the project ultimately leads to a reduction of open urban unemployment as compared to the hypothesis that project employment triggers additional rural-urban migration and therefore ultimately also affects underemployment in peasant agriculture. Moreover, in the second case an additional cost component would apply: rural-urban transfer costs, not only the actual transport costs, but also the costs of additional urban amenities that would be necessary to accommodate the newly-arrived migrants, as well as an allowance for a possible rural-urban cost of living differential. In both the above examples an additional cost component may consist of the social value of disutility of effort, while also a number of more indirect cost aspects may be important under various hypotheses, such as the impact of employing unskilled labour on the savings rate and on the foreign exchange balance. Most of these cost components have been dealt with at great length in the

current literature[17] and will not be further discussed here. However, it should be noted that it may not always be worthwhile to include all these considerations in view of the inevitable introduction of additional arbitrary assumptions on such complex matters as migrational motives, saving and import propensities of the workers employed, the social value of private disutilities of effort, etc. Quite apart from the value judgements which are in some cases inherent in this, the dearth of factual evidence may render inclusion highly speculative.

A.5.1.3.2 Land

Land (as well as other natural resources) is virtually in constant supply (reclamation is an exception) and the use of land for the project therefore denies its use to other purposes. The appropriate (shadow-) price is the ultimate consumer willingness to pay for the best alternative use foregone. Often these costs do not pose a great problem. In the case of industrial projects land is usually a quantitatively unimportant item and moreover, in such cases the market price can often be assumed to reflect the willingness to pay more or less adequately. In agricultural projects a similar assumption sometimes can be made, or if there is no alternative use (e.g. in the case of virgin jungle being utilized), the opportunity costs of the land will be zero (of course costs of clearing the jungle would have to be taken into account). However, in the case of urban land, market prices often are distorted. A major distortion of relevance to project appraisal is the influence of large scale public ownership of land and compulsory public acquisition of private land, which may mean that land costs in public projects do not necessarily reflect consumers' willingness to pay. Furthermore, possibilities of alternative uses for urban land are often severely restricted by land use and density zoning regulations instituted to guide the pattern

17. See e.g. UNIDO (1972, pp. 201–212), Little and Mirrlees (1974, pp. 270–291), Hansen (1973, pp. 23–29) and also Lal (1973), Mazumdar (1975) who discusses more elaborately the question of the costs of induced migration, by and large based on extensions of the Harris-Todaro model of rural-urban migration. See Harris and Todaro (1970) and Todaro (1969).

of physical urban development according to planning objectives. This clearly influences the opportunity costs of land. Since such restrictions are part of the regulatory framework, they have to be respected for the purpose of estimating the shadow-price of land.

A.5.1.3.3. Capital

Referring to the accounting price of capital, a distinction should be made between real and financial capital. In the context of shadow-pricing real physical resources used or generated by a project, only the valuation of capital goods or of their services rendered should be taken into account. The pricing of capital goods or their services is exactly the same as for any other resources generally, as discussed above. The flow of real resources over time caused by the project during its construction and operating phase also has its counterpart in the financial sphere: real flows must be financed and this financing entails a cost. Discussion of this aspect is deferred to section 6.

A.5.1.3.4. Tradeable goods and non-tradeable goods

If the project generates tradeable goods or services (see section 5.1.1) as its physical output or uses tradeables as its physical inputs, it may be difficult to establish conclusively the value of the project's net output or input. For instance, in the case of inputs, if supply of these inputs to the remainder of the economy is reduced as a result of the project, these inputs should be valued at the domestic willingness to pay in the alternative use foregone as discussed above. However, if these inputs are imported directly, cause additional imports elsewhere in the economy or reduce exports, supply of these inputs to the rest of the economy is unchanged and net input will be foreign exchange used (apart from local distribution and transport margins). Similarly for the project's physical output, if it solely adds to domestic supply, it should be valued at the domestic willingness to pay for this supply. However, if domestic supply remains the same, but the project's physical output is exported, substitutes for

imports, or causes exports elsewhere in the economy, net output consists of foreign exchange saved or generated (again allowing for local distribution and transport margins). Clearly it may not always be easy to determine in practice whether and to what extent domestic supply of physical inputs and outputs or rather foreign exchange availability will be affected by the project.

In the case of non-traded inputs this problem is compounded: if domestic supply is expanded as a result of the project's demand for these inputs (and consequently supply to the rest of the economy remains constant) these need to be split into primary factor incomes and traded goods (with the aid of an input-output table, if no more direct method is possible), which will then have to be valued according to the procedure described above.

To determine the amount of foreign exchange used or generated by the project in terms of domestic willingness to pay, the relevant traded goods should be valued at their c.i.f. (imports) or f.o.b. (export) prices in foreign exchange after which the net amount of foreign exchange generated or used should then be multiplied by the willingness to pay in domestic currency for a unit of foreign exchange. This 'shadow rate of exchange' or shadow-price for traded goods may differ substantially from the official foreign exchange rate. This is the case if the market for foreign exchange is a strictly controlled one. Rationing of foreign exchange takes place and the official exchange rate underestimates the domestic willingness to pay for foreign exchange. This is also the case if no quantitative controls on the foreign exchange market exist, but import tarrifs or export subsidies prevail because these tend to raise the domestic price level compared to world market prices, whereas export duties tend to lower the domestic price level. To calculate the accounting ratio for traded goods (ratio of shadow rate to market rate) it must be determined what the alternative use (foregone) of the marginal unit of foreign exchange generated (used) would be. Generally foreign exchange will be used either to spend on additional imports or to enable a reduction of exports while maintaining the level of imports (barring changes in the foreign exchange reserve position).

A general formulation of the accounting ratio for traded goods is provided below (UNIDO; 1972, p. 216):

$$AR_{tg} = \sum_{i=1}^{n} f_i \cdot \frac{P_i^D}{P_i^{cif}} + \sum_{i=n+1}^{m} x_i \cdot \frac{P_i^D}{P_i^{fob}}$$

where P_i^D = domestic price of tradeable good i;
P_i^{cif} = c.i.f. (border) price of good i (imports);
P_i^{fob} = f.o.b. (border) price of good i (exports);
f_i = share of increased imports of good i ($i = 1 \cdots n$) caused by the availability of the marginal unit of foreign exchange;
x_i = share of decreased exports of good i ($i = n + 1 \cdots m$) caused by the availability of the marginal unit of foreign exchange; and

$$\sum_{i=1}^{n} f_i + \sum_{i=n+1}^{m} x_i = 1$$

It should be noted that underlying this simple formula for the accounting ratio of traded goods are two important hypotheses:

—the formula assumes that existing trade policy (market exchange rate, tariffs and subsidies, quantitative restrictions, capital movement regulations or any other protective measures) remains unchanged during the lifetime of the project, rather than moving towards a free trade optimum (UNIDO, 1972, pp. 217–218). This is perhaps not very realistic but certainly more realistic generally than assuming that this optimum will or should be attained during the project's lifespan and calculating the shadow exchange rate accordingly. A relaxation of this assumption requires a prediction of future changes in trade policy and estimates of price elasticities of domestic supply of exports and domestic demand for imports.

—the country concerned is unable to influence world market prices (price elasticity of international demand for all tradeables is infinite). The alternative hypothesis, which may be quite realistic if the country's exports or imports of a particular good con-

stitute a sizeable share of its world market, requires an estimate of the price elasticity of world demand for that good.

Furthermore, the formula is only applicable to price distortions (tariffs and subsidies), but cannot be used in case of quantitative restrictions.[18] While in principle it is possible to adjust for alternative hypotheses regarding trade policy and world market conditions, as well as incorporating the aspects not taken into account,[19] it appears to be doubtful whether in practice this is worth bothering about in view of the enormous additional data requirements and/or additional assumptions that would have to be made. Even the simple formula above requires an arbitrary hypothesis regarding the determination of the f_i's and the x_i's. In practice it is usually assumed either that the additional unit of foreign exchange available is entirely spent on additional imports (but this further begs the question on which import goods) and does not affect exports, or that the additional unit of foreign exchange available is used according to the aggregate structure of the country's foreign trade.

A.5.1.4. Miscellaneous valuation problems

A so far undiscussed matter is the treatment of indirect taxes. The measurement of aggregate consumption costs and benefits by the willingness to pay implies that when the impact of the project is to take inputs away from other producers or add to the output available to consumers, taxes should be included. However if the impact is to generate additional production of inputs or to reduce production of output from other sources, taxes should only be included to the extent that they form a part of the marginal social costs of production (the resources used in additional supply of inputs

18. In UNIDO (1972, pp. 223–224), the practice of leaving those goods for which quantitative restrictions exist out of the calculation altogether is advocated, since simulating domestic willingness to pay for rationed goods is thought to be hardly possible.

19. In fact, a substantial literature exists on the merits of alternative formulations to take into account a project's impact on the foreign exchange position. See e.g. Little and Mirrlees (1974), Lal (1972b), Bacha and Taylor (1971), Dasgupta and Stiglitz (1974), Dixit and Stern (1974), Symposium on Shadow Exchange Rates (papers by Balassa, Scott, Bertrand, Batra and Guisinger, 1974).

or released by competing producers of outputs valued at consumer's willingness to pay for these resources: see also Hansen, 1973, p. 16; and Layard, 1972, pp. 19–20).

The impact of financing of projects has been ignored so far. This is all right if it can be assumed that the funds used to finance the project would, in the absence of the project, have been used to finance another public project. This situation, where the overall level of government expenditure is thought not to be affected by an individual project, is probably relevant to most project evaluation cases. However, a different situation would arise in the case where a project is (partly) financed out of additional taxes, additional domestic borrowing or out of project-tied foreign assistance (or foreign borrowing on commercial terms). In the first two cases the project would be partly at the expense of private consumption and partly at the expense of private investment. Thus apart from its direct aggregate consumption costs (see above), the more indirect impact on the consumption/investment balance as a consequence of financing should be taken into account[20] (see section 5.2 below). Obviously, this only applies if additional taxation or borrowing is induced by the project concerned, not if it would take place anyway. Likewise the impact of foreign financing should only be taken into account if this finance would *not* be available to the country in the absence of the project (otherwise use of the foreign exchange available though this source of finance would effectively deprive its use elsewhere in the economy), so this discussion is of relevance only in the case of project-tied foreign assistance or commercial loans. If (part of) the costs of the project are foreign-financed in this way, the 'net input' as defined above consists of the servicing costs of the loan so the 'physical' inputs provided under the loan arrangement can be ignored (see UNIDO, 1972, pp. 307–308; Little and Mirrlees, 1974, pp. 170–178; and Feldstein, 1973).

A.5.2. Aggregate consumption objective: externalities

When a project generates non-priced effects upon others than those

20. Disregarding tax-collection or debt raising costs.

who can be judged to be the direct beneficiaries of the project (consumers of the project's output and suppliers of its inputs), these gains or losses will not be reflected in the accounting prices for the project's output and inputs as determined by the consumers' willingness to pay. Such costs and benefits are called externalities. Two more characteristics appear common to almost all externalities, apart from their being direct, non-priced effects: they are generally thought of as incidental (unintended) and caused by a legitimate activity (see Mishan, 1975, pp. 109–121). Externalities may affect identifiable third parties or rather society as a whole. It is clear that the distinction between 'internal' and 'external' is not entirely unambiguous, depending in part on the definition of the project and its direct beneficiaries. However in practice this distinction can usually be made and it should be determined whether there are any (negative or positive) net benefits of an external nature. If so, these must be added to the direct contribution of the project to the aggregate consumption objective.

One of the main problems in taking external costs and benefits into account is the difficulty of quantifying many of these externalities. This is a serious problem, but it cannot be a justification to ignore them. If quantification appears to be impossible the effects concerned should be described qualitatively so that their importance at least can be considered by the policy maker in deciding on the project. A distinct category of possible external costs or benefits of particular importance to project appraisal in developing countries is the extent to which a project influences current aggregate investment versus current consumption and thereby indirectly the level of future aggregate consumption benefits. This applies only if the government judges the level of savings and investment too low or too high (otherwise there would be no need to treat consumption differently from investment, since they would be equally valuable to society). In such a case it is necessary to estimate the ultimate aggregate consumption benefits due to a unit of current investment, in order to make this comparable to the benefits due to a unit of current consumption. The present value of these ultimate aggregate consumption benefits is the 'shadow-price of investment'. Once this

measure has been established it must be determined which groups in society are affected by the project (in other words, who are the gainers and losers in terms of direct aggregate consumption costs and benefits – this must also be done in analysing the redistributional benefits, see section 5.3 below), to what extent they gain or lose and what is their marginal propensity to save out of income. If there are differences in the marginal propensities to save between gainers and losers, the project clearly affects the rate of savings in the economy. The net change in aggregate savings and investment generated by the project can then be estimated. The change in aggregate savings must be multiplied by the excess of the shadow-price of investment over unity and added to the direct benefits.[21]

The project's impact on savings is sometimes incorporated in the shadow-prices of resources, especially in the shadow wage rate (see section 5.1.3.1). However, it is felt that this aspect is best taken into account separately and explicityly according to the procedure outlined above. Shadow-prices as discussed in the previous section would then reflect only their efficiency value.[22]

A.5.3. The redistribution objective

If the government is concerned with altering the distribution of income in favour of certain deserving groups, a CBA of a project cannot be indifferent as to who are the net gainers and losers from the project. In the above discussion on the impact on the savings/consumption balance identification of these groups was necessary, but

21. For a more detailed description of the measurement of a project's impact on aggregate savings and the formula to be used for the shadow-price of investment, see Hansen (1973, pp. 37–44), UNIDO (1972, pp. 67–72 and pp. 173–188).

22. The impact on the savings/consumption balance is reflected in the accounting prices used by Little and Mirrlees (1974). UNIDO (1972) is not wholly consistent in this respect. On the one hand it appears that a separate treatment is advocated (pp. 67–72), but on the other, the impact on savings is also incorporated in the shadow wage rate (pp. 205–207). The treatment should of course be exclusive to one approach or the other, and not a mixture of the two. As mentioned by Hansen (1973, p. 30) inclusion of this impact in the shadow wage rate alone (and not in the other shadow-prices of resources) is inadequate. Since it is quite likely that the impact on the savings/consumption balance cannot be adequately expressed in all shadow-prices, separate and explicit treatment of this aspect is to be preferred.

no special weights were attached to the present value of the aggregate consumption of each group. In order to measure project costs and benefits concerning redistribution, gainers and losers from the project have to be identified in such a way that they are relevant to the government's redistribution objective (e.g. the poorest 10% of the population and the richest 10% if it is the government's aim to redistribute income from the very rich to the very poor). In practice, usually only a few groups can be considered separately. A redistributional benefit or cost is a net aggregate consumption benefit accruing to a particular group. Once the net aggregate consumption benefits accruing to each relevant group have been calculated, predetermined premium weights for net benefits accruing to each group vis-à-vis net benefits accruing to society at large should be applied,[23] and total net redistributional benefits will be obtained by adding results from each group. This total must than be added to net aggregate consumption benefits (direct and external).

An important feature is that to estimate aggregate consumption gains to each group, transfer payments that are irrelevant in estimation of net aggregate consumption benefits will have to be taken into account. Net redistributional benefits to any group are equal to the immediate aggregate consumption benefits it receives minus any offsetting payments made to other groups, and the redistributional costs to the group are equal to the immediate aggregate consumption costs it incurs minus any compensating receipts from other groups (see UNIDO, 1972, pp. 77–80).

Estimation of net redistributional benefits as outlined above has some interesting implications:

—if all prices adequately reflected the willingness to pay in all sectors of the economy, no redistribution as defined above would take place;

23. These weights can be both positive and negative, depending on whether the policy-maker feels that redistributional benefits to a particular group are more desirable or less desirable than net benefits accruing to society at large. The determination of the numerical value of the weights is a difficult problem as discussed in section 3.2 above.

—in the case of public sector projects, therefore, government pricing policy is of vital importance to the distribution of aggregate consumption benefits.

A.5.4. Total net benefits of the project

In the above, measurement and valuation problems of costs and benefits related to two objectives of general importance have been discussed in some detail. As noted in section 3, costs and benefits related to other government objectives should be included if not incorporated already in the costs and benefits discussed. Objectives such as employment, growth of income and balance of payments' equilibrium are of general importance, but it can be shown that costs and benefits related to those objectives have been taken into account implicitly already (see UNIDO, 1972, pp. 85–105). Therefore it is felt that by evaluating the costs and benefits in terms of aggregate consumption and income redistribution and adding them in the manner described above, an adequate index of national economic profitability will generally be obtained: however for each sepcific country, this index may require modification in view of other objectives that particularly apply in that country (see section 3.6 above).

A.6. THE SOCIAL DISCOUNT RATE (SDR)

In section 3 the SDR has been defined as the rate of decrease of the weights attached to net aggregate consumption benefits accruing over time. Aggregate consumption has been chosen as the numeraire in which net benefits are to be expressed (section 4) and the project's annual net contribution to other objectives is to be converted in terms of the numeraire and then added to the annual net aggregate consumption benefits (section 3, last paragraph). It follows that the SDR as defined above can be used to discount total net benefits accruing over time, as indicated in section 4. There are rather strong reasons for assuming that the weights attached to aggregate consumption decline over time, which implies a positive

SDR. This will be so if either of the following two hypotheses holds:

—it is felt that aggregate consumption now is more desirable than in the future (this reflects the so called 'pure' time preference).
—the policy maker has a diminishing marginal utility for aggregate consumption, combined with an expectation of an increased level of aggregate consumption in future (see Blitzer, 1973, p. 10; Little and Mirrlees, 1974, pp. 265–268; and Lal, 1972a, p. 9).

In Chapter 5 (section 5.2) two more specific formulae for the SDR reflecting the assumptions are presented.

It may be held that the SDR could perhaps be derived from market behaviour in a similar way as the shadow-prices discussed earlier or that the prevailing capital market rate of interest could serve as a proxy.[24] In view of capital market imperfections (gap between borrowing and lending rates, fragmentation, government interventions) and the possible divergence between private and social time preference, capital market rates cannot generally be accepted as adequately reflecting the SDR. In fact the capital market rate would only be acceptable if the following conditions held:

—perfect capital market
—perfect foresight on the part of the individuals as to their lifetime income
—absence of externalities related to savings
—optimal rate of investment.

Only under these circumstances does the capital market rate equal

24. A related argument is that the SDR should reflect the costs of displaced investment (social opportunity costs). See e.g. Baumol (1968). However in the present formulation this is already taken care of through the use of the 'shadow-price of investment' (see section 5.2). Consequently the total net annual costs and benefits (including possible costs of displacement of investment converted into aggregate consumption costs at the shadow-price of investment) will be discounted on the basis of society's time preference and marginal utility of consumption.

the marginal productivity of capital and also the SDR as determined by the social time preference and marginal utility of consumption (see UNIDO, 1972, pp. 156–164; Blitzer, 1973, pp. 13–17). Since this is not generally a realistic situation, determination of the SDR requires the political judgements implied in the formula in section 5.2, main text (see UNIDO, 1972, pp. 164–172; Blitzer, 1973, p. 17; Kirsch and Rürup, 1971, pp. 453–454 and Baumol, 1968, pp. 798–802). So the SDR should ideally be set by the government. In practice such decisions are not likely to be taken by most governments and for that reason the UNIDO guidelines advocates to calculate a project's net present value (NPV) using various alternative SDR's and to determine its 'switching value', being the numerical value of the SDR at which the project's NPV is zero (algebraically, this amounts to calculating the project's internal rate of return; UNIDO, 1972, pp. 167–168). However, it is possible to indicate an upper and lower limit between which these alternative rates should be chosen, being the estimated marginal productivity of capital and the rate of growth of per capita consumption respectively.[25]

A.7. UNCERTAINTY[26]

In the above the discussion has proceeded on the tacit assumption that all relevant costs and benefits, prices as well as physical inputs and outputs are fully known. Since most appraisals concern a future investment, this unrealistic assumption is discarded in the present section. Moreover even if an expost analysis is being carried out

25. These limits are derived from the specification of the shadow-price of investment. See Blitzer (1973, pp. 18–27), UNIDO (1972, pp. 188–193). Intuitively, it will be clear that the SDR should be higher the closer the investment level approaches its optimum, in which case the SDR equals the marginal productivity of capital and the shadow-price of investment is unity. If the level of investment is far below its optimum, a much lower SDR is called for, combined with a very high shadow-price of investment. In the UNIDO specification the shadow-price of investment approaches infinity if the SDR is put at the growth rate of per capita consumption, which can therefore be considered as a lower limit. See UNIDO (1972, pp. 188–189).

26. Following the UNIDO guidelines, the traditional distinction between risk (probability distribution known) and uncertainty (probability distribution unknown) is neglected here and both words are used interchangeably. See UNIDO (1972, pp. 107–114), Little and Mirrlees (1974, pp. 306–334).

such an evaluation would usually not be undertaken at the very end of the project's economic lifespan, so some element of uncertainty would still be present. However in such cases at least factors like underestimation of construction costs, delays in supply of building materials or machinery, problems in obtaining the necessary licenses, initial problems in operating the project, etc. can be included in the cost estimates with the certainty of hindsight.

There are a number of possibilities of incorporating the element of uncertainty in CBA. To begin with, several rules of thumb are sometimes used for this purpose. One of these is the use of the 'payback period', within which the initial investment outlays must be recouped. This method is crude and may be misleading. It does not offer a satisfactory means of comparing projects in different industries, since different normative payback periods are used in different industries (often without much justification). Moreover it ignores what happens after the payback period, thus discriminating against projects having long lifespans where benefits may pick up slowly over time (e.g. rubber and palm-oil planting, housing). If the greatest uncertainties lie in the construction and initial operating phases of the project, the use of a payback period hardly contributes to a reduction of uncertainty and would provide a misleading picture of the project's profitability. Finally the application of this rule of thumb precludes any analysis of the actual elements of uncertainty related to the project, even though in some cases these elements are not all that difficult to assess.

Another common rule is to use a risk premium on the rate of return, through arbitrarily lowering it by a few percentage points. This amounts to applying a higher discount rate than would be the case if the project were riskless. This rule too discriminates against projects whose benefits pick up slowly over time and does not analyse the particular elements of uncertainty relevant to each project. It would generally be better to consider all these elements systematically, rather than to rely on a crude overall impression. This is especially so if such an analysis is not too complicated. An example of this would be to calculate the Expected Present Value (EPV) of national economic profits. Ideally, this would amount

to assessing the probability of all possible values of the project's national economic profitability, multiplying these values by their probabilities and adding these products to provide the EPV.

In practice this calculation can be carried out at various levels of sophistication. The simplest variant essentially requires the analyst to attach mentally probabilities to various possibilities in his estimates of inputs, outputs and accounting prices. The figures that will eventually enter his calculation should be expected values rather than the most likely ones. No sophisticated or detailed calculations are necessary in this case but balanced judgement is important. A more complicated evaluation would be to examine various alternative outcomes of the project in detail, e.g. by comparing a very conservative, medium and very optimistic set of estimates concerning the development of output and prices and calculating the probability of each outcome.

More sophisticated techniques are necessary, if the success of the project vitally depends on the spread of risks.[27] In such a case it is necessary to estimate the probabilities of all possible outcomes of the present value of the project's national economic profits, enabling the analyst to calculate statistical measures of this spread. This is often a difficult task since all these outcomes arise from the coincidence of a large number of events, each with its own probability. This difficulty can be overcome by using all or part of the procedure outlined below:

—Identify the variables that determine critically the project's contribution to national economic profits by sensitivity analysis. This is done by changing the value of a number of variables, one by one, by a certain percentage and calculating in each case how present value of the national economic profits generated by the project will be affected.

—Attach probabilities to all possible values of those variables that have been found to determine critically the project's outcome.

27. For a detailed treatment of some of these techniques, see e.g. Reutlinger (1970) and Pouliquen (1970).

Assume all other variables to have their expected value. If no better estimate of the probability distribution is available for a critical variable, assume that it is normally distributed around its expected value.

—Generate all probabilities for the net present value of benefits to obtain its probability distribution, if necessary by means of random sample simulation. A number of technical problems are involved here, one of the potentially most distortive being that of possible interdependence of critical variables, which would considerably affect the probabilities.

—With the aid of set decision rules, recommend approval or rejection of the project. The specific rules to apply depend on the decision maker's attitude to risk, and would be related for instance to the probability of the project's present value of net benefits becoming negative, the magnitude of the standard deviation of net present value as compared with its expected value, etc.

A.8. ALTERNATIVE APPROACHES TO PROJECT APPRAISAL

In addition to the UNIDO and Little-Mirrlees approaches to project appraisal as discussed in the previous sections, several other methods have been advocated, which will be briefly discussed below.

A.8.1 The domestic resource cost or Bruno method[28]

This method is essentially a short-cut compared with the two approaches discussed above. It divides annual direct and indirect costs of a project into domestic (labour only) costs and foreign exchange costs (if possible with the aid of an input-output framework). Annual output is valued in terms of foreign exchange earned or saved. The selection criterion then consists of the amount of domestic resources used per unit of foreign exchange (net) saved by the project. This is compared with an estimated shadow exchange rate (SER) and projects are approved (if their domestic

28. See Bruno (1967 and 1972).

resource cost value is lower than the SER) or rejected (if higher) accordingly.

The obvious advantage of this approach is that it is much simpler to apply than the UNIDO and Little-Mirrlees methods. Accordingly, its data requirements are less. However several disadvantages offset this: only projects having tradeable outputs can be evaluated by this method; no allowance can be made for the time profile of the project (since the basis of evaluation is a single year's full capacity operation) and consequently the NPV criterion cannot be used. Moreover, only trade distortions are considered and no allowance is made for distortions in the labour market, externalities or other government objectives. The conclusion must be that this method is a very partial approach and that it cannot really substitute for a fully-fledged appraisal.

A.8.2. The effective rate of protection method[29]

This method is a short-cut very similar to the Bruno approach. It has as its selection criterion the percentage excess of value added at domestic prices in processing over value added at border prices per unit of value added at border prices.

It gives rise to criticisms similar to those levelled at the Bruno approach: it is a very partial approach looking only at trade distortions. In addition it does not really compare inputs and outputs and hence does not provide a proper investment criterion. The fact that a certain industry has a higher rate of effective protection than another does not imply that the first industry cannot yield higher returns, e.g. in terms of value added (at world or domestic prices) per unit of investment than the second one.

A.8.3. The McGaughey-Thorbecke approach[30]

This method is specifically aimed at relating project effects to multiple government objectives. For this purpose the following criteria are taken into account:

29. See e.g. Balassa (1974).
30. See McGaughey and Thorbecke (1972, 1973 and 1974), Hyslop (1973), Ward (1974).

—benefit-cost ratio (using market prices and selective shadow-prices for labour and foreign exchange – secondary and indirect costs and benefits are ignored);
—the social marginal productivity of investment (consisting of two components – a social profitability ratio plus the balance of payment impact valued at the proportional excess of the shadow exchange rate over the official rate); and
—three partial investment criteria, being the output-investment ratio, the labour-investment ratio and the foreign exchange earnings-investment ratio.

These criteria are each thought to reflect one of the multiple government aims. Projects are ranked ordinally and cardinally (by using deviations from mean values) according to each criterion. Then a national preference function is postulated, consisting of a weighed linear function of the objectives, which is used (employing various combinations of weights) as a decision rule in project selection.

This approach is of interest because of its strong emphasis on the problem of accommodating the multiplicity of government objectives. However, the assignment of criteria to represent objectives is rather superficial (especially in the case of the income redistribution objective). A major drawback is the heavy emphasis on ranking throughout the procedure. If a new project is added to the list of projects to be compared, this affects the values attached to all other projects, both in ordinal and cardinal rankings. This is avoided if multiple government objectives are incorporated according to the UNIDO approach (see section 3) and a modified NPV is calculated for each project accordingly.

A.8.4. The 'effects' approach[31]

This approach studies the effects (direct and indirect) of introducing a project into the economy. It attempts to specify all such effects in great detail. Basic variables used are annual project turnover, broken down into total imports used and total value added (itself broken down into its domestic primary components), the costs of

31. See e.g. Chervel (1973a and 1973b) and Schneider (1975, pp. 33–34).

investment and a hypothesis regarding the alternative to the project. Gross income flows generated by the introduction of the project into the economy may be specified according to region, income group, category of recipient, impacts on the rate of savings and on the balance of payments, depending on the constraints and the objectives of the government. This method does not attempt to arrive at a synthetic criterion of national economic profitability and consequently does not use shadow-prices or weights. It stops at providing a balance sheet of relevant effects to the policymaker. This means that comparatively few value judgements are required on the part of the analyst. Its data requirements are considerable, but not quite as substantial as for the UNIDO and Little-Mirrlees approaches. The obvious major drawback of this method is that it increases the risk of inconsistent decision making, since in the absence of a synthetic criterion the policy maker is required to make ad hoc comparisons whenever a project is presented.

A.8.5. Summary review of alternatives

It appears that none of the alternatives to the UNIDO/Little-Mirrlees approach is equally comprehensive. Most of the alternatives discussed above entail considerably fewer data requirements (except for the McGaughey-Thorbecke approach) and are perhaps easier to use. Thus it seems there is a trade-off between refinement of method and the effort required in applying it. However this need not be: it is quite possible to apply the UNIDO or Little-Mirrlees approach at different levels of sophistication, depending on data availability and competence of the planning bureaucracy (see e.g. Little and Tipping, 1972; Hansen, 1973; and Overseas Development Administration, 1972).

A.9. LIMITATIONS OF CBA

Current differences of opinions as to the shortcomings of CBA as an analytical tool for decision making with regard to the alloca-

tion of scarce resources can by and large be classified into three areas of debate, differing in their implications for the usefulness of CBA.

A.9.1. Criticism regarding practical applications of CBA in particular cases
These criticisms are not directed so much against the use of CBA as a tool of analysis as such, but generally point at shortcomings in practical applications. However it is sometimes held that these shortcomings are large enough to question seriously the wisdom of applying CBA techniques at all. In particular the following criticisms are prevalent (see e.g. Wolfe, 1973, pp. 10–11):

—Often some of the more important variables are neglected in CBA, because they are difficult or impossible to quantify.
—CBA sometimes tries to quantify the unquantifiable.
—CBA is often not being used as a tool of analysis but as an instrument of policy.
—CBA sometimes makes no allowance for non-competitive conditions in areas other than those of immediate concern.

The first, third and fourth criticisms certainly carry some weight and should caution against being too careless with regard to these factors. The challenge that CBA is sometimes used as a policy instrument is an especially serious one.[32] However provided all assumptions used in the analysis are explicitly brought out it is possible to check whether the analysis has been carried out correctly and to criticize its assumptions.

32. This, of course, applies to almost all kinds of applied research, especially in the socio-economic sphere and can be viewed either as a general anti-analysis argument or as a warning that adequate safeguards are needed against such abuse. See also Stewart (1975), who argues that CBA is an instrument in the class struggle, in view of its emphasis on government aims, since governments generally represent only a section of society and are prone to defend only the interests of those groups they represent. However from a methodological point of view it is not essential to look at government aims. CBA merely provides the framework for more rational and explicit decision making.

The second criticism is based on a misconception of CBA. CBA attempts to order all relevant considerations in the process of decision making in a systematic and explicit manner. Since 'unquantifiable" considerations will inevitably always enter into this process, it is felt that attempts at quantification, explicitly stating the assumptions used, could facilitate the process considerably. The above criticisms do not limit the scope of CBA, but rather highlight the fact that there are bad CBA's and good ones.

A.9.2. Differences of opinion regarding the treatment of particular elements in CBA

A large number of issues of such nature are currently being debated which generate questions for further research to improve on the existing framework. Such criticisms do not question the usefulness of the framework as such, neither do they suggest that these problems cannot be solved in practice (admittedly, as is clear from the main text of this study and from the preceding sections, some of these solutions would be somewhat arbitrary, but nevertheless sufficiently accurate for practical evaluation purposes). Some such issues are listed below:

—Since it cannot be assumed that government intervention has no social costs, how should these costs be taken into account?
—How should shortages and disequilibria be treated?
—How can consumers' preferences for non-marketable goods be measured?
—What is the influence of technological change upon a project's economic lifespan?
—What theoretical rate should be used as the social rate of discount?
—Which cost-benefit criterion is the best to use? Internal rate of return or net present value in any of its forms? In the latter case, should a difference or a ratio be used?
—What are the determinants of the opportunity costs of labour?
—Should redistributional considerations be included in CBA or should it only be concerned with aggregate consumption?

A.9.3. Major theoretical and practical problems limiting general application of CBA

Boundaries between the three areas of dissent are not completely clear-cut. The last item listed in the previous section is clearly related to the first listed major difficulty facing a widespread use of CBA:

—All judgements on weights of objectives and certain accounting prices (such as the shadow-price of investment and the social rate of discount) are essentially explicit political choices. Therefore these judgements should ideally be solicited from the government (assumed to be the policy maker on behalf of the nation). As has been seen this raises a number of problems because of the understandable reluctance of politicians to commit themselves to a set of quantitative weights. Added to this is the problem that the government is not a monolithic policy maker – within it a large number of decision makers exist – which virtually excludes the possibility of obtaining consistency in the weights attached.
—The application of CBA in social fields such as health, education, defence and housing is still in a rather experimental stage and it would be unreasonable to require government planners in these fields to apply CBA techniques as a matter of routine at this juncture.
—Another problem is how to translate CBA results from its partial to a general equilibrium system. This problem lies at the frontiers of theoretical knowledge at present. Incorporation of CBA results into a national economic planning framework are being attempted, but still suffer from serious shortcomings. This aspect will be discussed in some detail in the next section.

The above problems seriously affect the operational scope of CBA. At present perhaps one can at best expect a fairly consistent application within one government department if some decisions on weights to be attached to objectives and other important parameters can be obtained from the departmental leadership. It is clear that much analytical ingenuity and far-sighted political wisdom is

necessary to develop CBA into a fully-fledged, widely used tool of analysis for public sector investments.

A.10. CBA AND NATIONAL PLANNING

The relationship between project appraisal and national economic development planning is one of mutual dependence. On the one hand national parameters in CBA such as weights of objectives, the SDR and all shadow-prices are expected to be derived from a national economic planning framework, on the other hand projects are "the heart of development planning" (see Tinbergen, 1965, p. 378); the reservoir of existing and potential projects affects the feasibility of the macroeconomic plan. In other words, projects require plans and plans require projects.

One could ideally visualize a development plan as an optimum programming model of the economy. The objective function could conceivably be specified in such a way as to incorporate all weighed objectives (including changes in weights over time). If resource constraints are specified as well as information provided on inputs and outputs of all existing and potential production processes taking place in the economy, the solution of such a model would yield the optimum quantity of all goods to be produced over time (as well as all optimum prices, which, however, are redundent since all quantities have already been specified). In such a model there would be no place for a partial analysis technique like CBA, since all projects that are to be carried out have already been determined in the general model.

For obvious reasons the above does not reflect present planning realities in developing countries. In addition it is highly unlikely that the state of the art in optimization models will ever reach the level of sophistication required. Apart from problems in specifying the objective function, to feed technological information of a sufficiently disaggregated nature into the model and to forecast future technological development correctly is virtually impossible (Little and Mirrlees, 1974, pp. 90–92; UNIDO, 1972, pp. 131–132). In fact,

development plans as utilized in practice are generally a far cry from optimality. Usually such plans chart roughly the course of the economy in the years to come and public debate mostly centres on their internal consistency and feasibility. This means that project appraisal will remain an indispensable complement to macro-economic and sectoral planning. It also means that only a limited number of 'national parameters' needed in project appraisal can be inferred from the plans.[33]

It seems to be realistic to view the planning process as an iterative procedure, starting from a crude overall framework, setting forth macro-economic magnitudes such as the time path of total national income, total savings and total investment. This will be followed by estimation of sectoral demand development, which can then be used as a check on the figures estimated in the macro-phase. In the case of considerable discrepancies, both sectoral and macro-estimates will have to be repeated. A prerequisite of development planning is the existence of a sufficient stock of projects, that could be carried out within the terms of the sectoral and macro-framework. However, quite often projects yielding a net positive contribution to development aims may be in short supply compared with estimated sectoral investment targets as derived from the sectoral framework. In that case sector estimates will have to be revised and this in turn is likely to affect the macro-estimates. Revised macro-estimates obviously have an impact on some of the 'national parameters' (notably shadow-prices) needed in project appraisal and this will influence the outcome of appraisal calculations, leading to subsequent rounds of reconciliation with sectoral and macro-estimates. While this trial and error method[34] may not be as elegant as an elaborate optimizing model of simultaneous equations, it has considerably more practical value. It clearly illustrates the continuing importance of project appraisal in development planning.

33. However the consistency of shadow-pricing may be improved with the aid of a hypothetical planning model. See M. Bruno, *Planning models, shadow prices and project evaluation*, pp. 206–211, in Blitzer et al. (1975).
34. Also called 'planning in stages'. See e.g. Tinbergen (1962), Qayum (1973).

Appendix B. Impact of squatter rehousing on selected social variables

B.1. INTRODUCTION

Improved housing for low-income groups has often been loosely justified with claims that such housing has a favourable impact on factors such as health, incidences of crime and delinquency, that it reduces fire incidences, improves work and school performance, leads to higher morale and improved morals as well as increased family stability.[1]

Most of the available research evidence on such relationships (which incidentally is rather inconclusive) pertains to developed, industrialized countries, particularly the USA.[2] It is only recently that attempts have bee made to verify some of these claims for improved low-income housing in developing countries.[3]

In a cost-benefit framework such impacts are only of interest insofar as they give rise to 'spill-overs' (see appendix A, section 5.2, appendix C, section 2.3 and section 4.2.2 in the main text). However to identify and as far as possible to quantify these spill-overs, verification of the actual existence of the above social impacts and, where possible, a quantitative estimate of their magnitudes are prerequisites. The following sections describe an attempt to verify and quantify those impacts that appeared most promising regarding squatter rehousing in the Kelang Valley area, Peninsular Malaysia.

1. See the typology of housing benefits in Burns (1966).
2. For a review, see Burns and Grebler (1977, pp. 126–140).
3. The most comprehensive attempt to date is the *International Housing Productivity Study*, the main results of which are summarized in Burns et. al. (1970) and Burns and Grebler (1977, pp. 141–192).

B.2. HOUSING AND HEALTH

B.2.1. Introduction

As shown in fig. 3.1 a component of the standard of living that is thought to be directly influenced by investment in housing is the physical and mental health of the occupants of the new housing. Several causal relationships are important in this context: improved housing means a positive change in the healthiness of the environment, which in turn has a favourable impact on the health status of the occupants. This may lead to reduced utilization of medical care and consequently to savings for the households concerned in terms of reduced transport costs to care and costs of care. Moreover, if households are not charged the full costs of care, but substantial parts of these costs are paid for by others e.g. the employer or the government, reduced utilization of care implies savings external to the households concerned. All these aspects will be discussed in turn below.

B.2.2. Changes in health environment and health status

The impact of poor housing conditions on health environment of the occupants and on incidence of diseases among them are probably among the most written about social aspects of housing. Housing factors of prime importance in the health environment are overcrowding, availability of piped water and of proper sanitation. Numerous studies have been carried out on the relationship between overcrowding and the incidence of diseases such as measles, whooping-cough, tuberculosis and rheumatic fever. Poor housing conditions also have been associated with meningococcal disease, anaemia, dengue haemorrhagic fever and digestive diseases. Mental disorders, too, have frequently been related to living in inconvenient, uncleanable, noisy, drab housing conditions at high housing densities. However in spite of the abundance of studies relating poor housing to disease incidence the available evidence is far from conclusive and sometimes outright contradictory, e.g. regarding the effect of crowding on the incidence of tuberculosis

and rheumatic fever.[4] This may partly be caused by the fact that most of these studies report only an association between bad housing and disease incidence, for instance by comparing disease incidences among slum-dwellers with municipal or national averages. In this way it is not possible to isolate the impact of poor housing as such from other possible influences on disease incidences such as income levels, nutritional habits, availability and accessibility of medical care, etc.

To estimate the influence of housing conditions properly, a test-control study of housing improvement must be carried out, in which it can be ascertained that there were no essential differences between test and control groups prior to rehousing of the former. Since this requirement is difficult to satisfy in any practical research setting, it is not surprising that only a limited number of such studies have been carried out to date. In Singapore, a study on the effect of rehousing squatters in flats (implying substantial improvements regarding crowding, water supply and sanitation) upon the incidence of enteric and respiratory infections found that the incidence of the 'common cold' was higher among squatters' children than flat-dwellers. However the colds among the rehoused squatters in the flats lasted longer. The infection rate for round-worm (*Ascaris*) was markedly lower among flat-dwellers than among squatters, but the pattern was found to be complicated by past histories of sanitation and exposure, habits regarding place of eating and personal hygiene (see Kleevens, 1972, chapters 3 and 5). A similar situation was found in a study of rehousing rural villagers on a Federal Land Development scheme in Malaysia involving major improvements in water supply and sanitation, but little change in crowding. The incidence of helminthiasis was reduced with rehousing, but continued to be high among toddlers who were not required to use the new latrines in the customary child-rearing practices. Of greater significance in the altered health environment of the settlement, however, was the general decrease in all forms of community morbidity, whereas

4. See World Health Organization (1972) and Kleevens (1972, pp. 10–21) for surveys of studies on the housing-disease incidence relationship.

the incidence of diseases maintained by personal unhygienic behaviour – such as skin conditions – remained high (Meade, 1974, pp. 73–80, 93–103). In the case studies of rehousing urban squatters in public low-cost housing in Kelang Valley, Malaysia, substantial improvement of the health environment was found in the areas of water supply and sanitary facilities (not only in the types of facilities used, but also in their exclusive use by the households concerned), drainage, waste disposal, nuisance caused by rats and general cleanliness. Aspects of the health environment showing little or no improvement with rehousing were crowding, mosquito problems and problems of distance to medical care, whereas the problem of noise and nuisances caused by neighbours deteriorated with rehousing.[5] Expenditure data for both rehoused and non-rehoused households (matched among other things on the basis of household income) showed that regular payments for housing (rent, electricity and water), as an average percentage of total household expenditure increased from 3.4% to 18.3% with rehousing with a concomitant decline in the average share spent on food from 53.3% to 47.9%. This may have caused malnutrition problems for some of the rehoused households, but this, however, was impossible to verify. For one of the rehousing projects studied (*B*) it was possible to examine medical records on outpatient visits of matched rehoused and non-rehoused workers by type of complaint for a period of two years prior to rehousing of the test group until 16 months after rehousing.[6] The data revealed that of those complaints that could possibly be related to rehousing, enteric disorders showed a substantial decrease attributable to this. This was to a lesser extent the case for skin complaints. Respiratory complaints, fever and influenza, infectious

5. See section 4.3.3 in the main text and also Meade and Wegelin (1975, pp. 50–54). The extent of the improvement of various aspects of the health environment greatly differed among the six housing projects studied, depending mainly on the type of housing, maintenance and location. This also explains differences between the data provided in Meade and Wegelin (1975) and in section 4.3.3, since the former study only referred to the four rehousing cases in greater Kuala Lumpur.
6. This refers to one of the rehousing schemes near Port Kelang (*B*). Test and control groups both consisted of 65 port labourers employed by the Cargo Handling Corporation, which kept a central record of all outpatient and in-patient visits to medical care as well as medical leave days taken by its employees.

(non-enteric and non-respiratory) and neurological complaints did not show any decrease attributable to housing.

A similar method has been used in a study carried out in Merced County, California. This study found that rehousing of the test group led to substantial improvements in health environment, notably in the areas of water supply, sanitation, rat infestation and garbage disposal. These improvements in health environment caused a relative decline of outpatient visits for test group households as compared to the control group for almost all diagnostic categories, the main important changes being in the areas of infectious and parasitic diseases and skin diseases (apart from important declines in the fields of symptoms, senility and ill-defined conditions as well as examinations). Perhaps more important are the findings that when visits were categorized into housing-related complaints and complaints unrelated to housing, a larger improvement (relative decline in visits) was registered for housing-related complaints than for complaints unrelated to housing.[7]

Summarizing, it appears that the influence of improved housing on health environment and health status of the occupants may be substantial. However, much depends of course on the extent and the nature of the improvement and, at least equally important are the behavioural characteristics of the occupants.

B.2.3. Utilization of medical care and related saving

The relationship between improved housing and utilization of medical care is little documented. The only major studies in this field known to this writer are those carried out by the International Housing Productivity Study, UCLA. A total of eight case-studies of rehousing in various countries have been carried out on a number of indirect effects of improved housing. Evidence on the relationship of improved housing and health care utilization has been obtained

7. See Wambem (1970, particularly pp. 36–43), Wambem and Piland (1972). See also Burns et al. (1970, pp. 99–101) for some data on a similar study carried out in Zacapu, Mexico. Disease areas showing substantial decline after rehousing were infectious and parasitic diseases and diseases of the digestive system. Housing-related outpatient visits showed a substantial decline after rehousing, but this was off-set by an increase in visits about complaints unconnected with housing.

in five case-studies.[8] In the Korean and Californian case studies overall utilization of health care by test groups showed a relative decrease with rehousing compared with utilization by control group households. This applied both to outpatient visits and in-patient treatment, except in the case of Merced County, where data on in-patient treatment were too few to allow comparison. In the Mexican case study overall levels of outpatient visits and in-patient treatment of the test group did not show a decrease vis-à-vis the control group; however, visits for complaints classified as housing-related did (see footnote 7). In the case of Limuru, Kenya, no pre-housing level of utilization of medical care was available for test and control groups. The average number of clinic visits did not differ significantly after rehousing. However the test group lived immediately adjacent to the clinic, while the control group members lived further away. Since other studies have shown that the expected number of visits varies inversely with distance from medical care, the study concluded that there is evidence that the test group made fewer visits than would be expected were location held constant.

The rehousing projects studied in Peninsular Malaysia showed considerable differences in their impact on utilization of medical care. Rehousing significantly increased distances to care in two cases (*E* and *C*), by 2 and 1.5 miles per average trip respectively. Only in the first of these two schemes (*E*) was this also perceived as such by the residents, in that the percentage of households reporting distance problems to care was substantially higher for the test group than for the control group. Increased distance to care in this case also led to an average increase of M$0.05 in transport costs per trip. Since complaints regarding availability of transport as perceived by rehoused and non-rehoused households remained at the same level, the consequences of increased distance to care consisted mainly of longer travelling time. In two other schemes (*D* and *F*) rehousing did not significantly affect distances to care, perceived

8. Hambaek (South Korea), Zacapu (Mexico), Pine Ridge (South Dakota, U.S.) and Limuru (Kenya) as documented in Burns et al. (1970), and Merced County (California, U.S.), as reported on in Wambem (1970) and Wambem and Piland (1972).

problems in this respect or regarding availability of transport, while in the remaining two schemes (*A* and *B*) rehousing brought an improvement in these respects. Thus only in one out of six cases it may have been possible that decreased accessibility of care caused by rehousing has led to a reduction in visits to care.

Rehousing gave rise to a significant decrease in outpatient visits for two out of six schemes (0.2 and 0.16 visits per person per annum), one of which being scheme *E* for which visit rates may have decreased after rehousing as a consequence of lower accessibility of care. In the second case (*D*) squatters were rehoused on the spot, so no such effect could be expected. For two schemes (*B* and *F*) no significant change in the rate of outpatient visits was found, in one scheme (*C*) the rate actually increased with rehousing, while for the remaining scheme (*A*) no data could be obtained.[9]

Data on in-patient treatment have been obtained for schemes *C* and *D*. A considerable relative decline of days of in-patient treatment of the test group compared with the control group was recorded (0.22 days per annum per household member for on-the-spot rehousing scheme *D*). For the other scheme the decrease found was not significant.

B.2.4. 'Spill-over' effects

Clear 'spill-over' exists if the rehoused households record a lower rate of utilization of outpatient and/or in-patient medical care, provided they do not have to pay themselves for this utilization of care. If this is the case, a saving to others e.g. the government or the employer is implied. This applied to most of the cases studied by the IHPS team and for the Peninsular Malaysia schemes as well.[10] In the latter case government sponsored medical care is provided free of charge or at nominal costs, while visits to private or company doctors in the vast majority of cases are paid for by the employer.

All other changes mentioned are not generally external to the

9. For an elaborate account of the tedious process of data collection, see Wegelin (1975, pp. 98–112).
10. For quantitative estimates see appendix C, section 2.3.

rehoused households[11] (except in the unlikely case in which transport costs to care are paid for by third parties). It has been assumed in the main text (section 4.2.2, see also appendix C, section 2.2) that these effects are accounted for in the willingness to pay for improved housing.[12]

B.3. HOUSING AND EDUCATION

Studies of the impact of improved housing on education are scarce. This is perhaps not surprising since this impact is transmitted through intervening health variables. To the extent that physical and mental health of rehoused schoolchildren is improved as a consequence of rehousing, absence from school caused by illness is likely to decrease and performance at tests and examinations may improve.[13] Moreover, if improved housing has a positive impact on environmental factors such as crowding, noise and lack of privacy, this will positively influence study possibilities at home, which in turn may influence test and examination performance. If rehousing means increased distances to school, this may negatively influence both attendance and performance. In addition, some of the effects will probably only be felt in the long run, as in the case of increased earnings caused by improved educational performance. Improved performance also means short-term increased efficiency of the educational system: the same educational inputs result in increased output, or, viewed from a different angle, the same level of output could be achieved with a decreased level of educational resources.

11. Remoter externalities, such as a reduction in the spread of contagious diseases as a consequence of improved housing have not been taken into account.
12. See however Mittelbach et al. (1969, p. 7ff.) who discuss the possibility that some indirect effects, while benefiting the consumers, are not perceived as such by them and consequently cannot be assumed to be included in their willingness to pay for housing services.
13. See however Weisbrod et al. (1973, pp. 68–72 and 114–135). This study found that selected parasitic infections were not significantly related to pupils' academic performance and that incidences of only one infection (schistosomiasis) were significantly related to absenteeism in school, but in the direction opposite to prior expectation (inversely).

The effects of improved housing on educational performance have been tested by Burns et al. in four sites[14] by comparing absences and test and examination records before and after rehousing of test and control group children, and in one case by comparing the number of years of schooling completed after rehousing. Only in one site (Pine Ridge) was a decrease in absence found that could be attributed to improved housing (see Burns et al., 1970, p. 45). In the case of education, a test-control study is more difficult to carry out than in the case of the housing-health relationship discussed above. This is caused by the indirect nature of the housing-school performance link, which implies that additional external influences must be controlled to be able to attribute any improved performance to the change in housing.

In the Malaysian case-studies the main indicators used were absence and test and examination results, while attention has also been given to the possible adverse impact of changes in distances to school. In five out of six cases these distances increased but average increases were not large (table 4.4, main text), ranging from 0.2 to 0.7 miles (probably partly due to the beneficial effects of the education ministry's policy to provide children of rehoused squatters with a place in schools as near as possible to their new home). It was further found that for all schemes taken together, rather surprisingly, average absence rates in school increased with rehousing (by 0.89 days per pupil annually), but that – perhaps even more surprising – average test and examination results improved by 5.3% over pre-rehousing levels (see appendix C, section 2.3).[15] The impact of housing on educational efficiency has both internal and external aspects. To the extent that educational inputs are saved at the same level of output, this implies an externality vis-à-vis the rehoused households, but to the extent that output (performance) is increased at the same level of inputs, the effect is internalized. Increased distances to schools lead to increases in travelling time and costs which are generally borne by the households concerned and therefore internalized.

14. Monterrey (Mexico), Pine Ridge (South Dakota, U.S.), Merced County (California, U.S.) and Puerto Rico. See Burns et al. (1970), Wambem (1970).
15. For a detailed account of estimation procedures, see Wegelin (1975, pp. 125–129).

B.4. HOUSING AND PRODUCTIVITY

For the relationship between improved housing and increased productivity at work a similar causal chain applies as for the above housing-education relationship. Improved housing conditions give rise to improved mental and physical health and this is presumed to affect favourably workers' absence from work and their performance while at the job.[16] Decreases in absenteeism and improvement of on-the-job performance lead to increases in output and earnings, which ultimately benefit the employer, the employee or both. Any empirical test of the housing-productivity relation is severely hampered by the indirectness of the causal chain. As in the case of education, it is necessary to control a large number of external influences to ensure that observed changes in productivity can be attributed to improved housing. Again, a before-after, test-control study should be carried out. In this case, apart from the more common pre-housing similarity requirements between test and control groups as mentioned earlier, additional conditions are that members of both test and control group should preferably be engaged by the same employer, doing the same jobs in which the worker actually has the possibility of influencing productivity (e.g. where work speed is not machine-dictated). As in the cases of health and education, an important aspect of change caused by improved housing is the possible impact on distance, travelling time and expenditure from home to work. This may modify the impact of improved housing on productivity.

The impact of improved housing on productivity has been tested by Burns et al. at six sites.[17] Some of these case-studies clearly illus-

16. The health-productivity relation is well-known; see e.g. Karyadi and Basta (1973), Basta and Churchill (1974) for a well documented study in Indonesia, linking iron deficiency anaemia to physical productivity. It was shown that this deficiency accounted for a decline of approximately 20% in workers' productivity compared with non-anaemic workers. Weisbrod et al. (1973, pp. 72–80, 136–163) have tested the impact of various infectious diseases on labour productivity in St. Lucia.
For ascaris and schistosomiasis infections a significant adverse effect was found, as well as for all parasitic infections combined.
17. Pine Ridge (South Dakota, U.S.), Hambaek (South Korea), Zacapu (Mexico), Ciudad Guayana (Venezuela), Monterrey (Mexico) and Limuru (Kenya). See Burns et al. (1970, pp. 49–51, 55–65, 79–80, 87–90, 117–119 and 142–144).

trate the enormous difficulties that may be encountered in controlling external variables. In the Pine Ridge study, for example, it was found that rehoused workers reaching a certain maximum income level faced eviction from the public housing scheme. This acted as a disincentive to productivity increases on the part of the rehoused workers, but did not apply to the control group. This means that not much significance can be attached to the findings of this case, showing a housing related increase in productivity and incomes during the first four months after rehousing, after which a decline to pre-rehousing levels took place. In the Korean case (where the samples were much larger) substantial improvements in productivity and output caused by rehousing were found, which for more than 55% benefited the workers in the form of increased income, while the remainder accrued to the employer. Here improved housing acted as a powerful inducement to increase productivity since the new housing units (provided by the employer), for which a keen competition existed among the workers, were assertedly allocated to the more productive workers.[18] Thus productivity levels for both test and control groups rose substantially during the year after rehousing, the increase for the test group being somewhat larger than for the control group. In the Monterrey case-study differences in the nature of work organization, payment for work, promotion schemes and sample bias between test and control groups precluded any firm conclusions. Similar problems were encountered in the Zacapu case, where only a short-term improvement could be found. In Ciudad Guayana, where promotion rates and daily wages were used as proxies for productivity, no significant improvement could be attributed to improved housing. For the Limuru case study no pre-rehousing data were available and therefore only post-rehousing differences in productivity between test and control groups could be observed. No significant differences were found.

18. In fact, however, pre-rehousing productivity levels were identical for test and control groups. It should be noted that this implies a different causal chain from the one discussed above: productivity increases as a result of the desire for improved housing, not as a result of improved mental and physical health caused by improved housing.

At three sites data were also collected on absenteeism rates of workers in test and control groups. In none of these three cases did the data suggest that improved housing conditions led to a reduction in absences (due to illness) from work. So this study concluded that: 'the productivity benefits of rehousing are likely to be small' (Burns et al., 1970, p. 142) and 'improved physical housing quality is not likely to substantially affect absenteeism from work due to illness. . .'[19]

In the Malaysian case-studies productivity data were collected where possible (see appendix C, sections 2.2 and 2.3). In one scheme (*B*) a near perfect pre-rehousing comparability of test and control groups was available. Not only had workers from both test and control groups been employed by the same employer (Port Kelang Authority) throughout the reference period, but they could also be matched in detail as to the type of work performed. Unfortunately however, productivity proxies had to be used since data on physical output could not be obtained. Since the system of remuneration only allowed merit payments through overtime and promotions, these were used as indicators, as well as data on absences from work. For one scheme (*A*) no productivity data could be obtained at all and similar changes have been assumed as those for comparable scheme *B*. For the remaining four schemes analysis was hampered by the large number of self-employed in the test and control groups. This meant that for one scheme (*F*) the sample on which data could be obtained became too small for any meaningful comparison. For the three remaining schemes an additional problem arose: the criteria that workers in test and control groups should work for the same employer and carry out identical jobs could not

19. Burns et al. (1970, p. 144). See also Weisbrod et al. (1973, pp. 86–88) who suggest that cultural factors could perhaps off-set potential productivity increases caused by improved health. For instance, preference patterns may be focussed at a specific income level, beyond which disutility of effort increases sharply. This would mean that a less healthy worker would work more hours at a lower hourly productivity to achieve a certain income. If his health and concomitant hourly productivity improves, his reaction would then be to work fewer hours to earn the same income as before. This is a variant of the well-known backward bending labour-supply hypothesis.

be satisfied. This meant that comparison of physical output became rather futile and the possibility of uncontrolled external influences increased. Yet because data could be obtained on a number of productivity proxies (such as absence from work, number of days actually worked, overtime hours, promotions, basic wages, allowances and bonuses, overtime pay) and because workers included were employed by the same employer throughout the reference period (two years prior to and at least two years after rehousing), it was felt that a useful comparison was still possible, even though circumstances were less than ideal (see Wegelin, 1975, pp. 120–125 for further details).

For the four schemes then, where measurement was attempted, the data suggested that increased productivity caused by rehousing as reflected in increased amounts of overtime and bonus payments arose in three cases (*B*, *C* and *E* to the extent of M$ 16, M$ 249 and M$ 59 per worker respectively).[20] In the fourth case *D* no change attributable to housing was found. Data related to absence from work did not show any appreciable change caused by rehousing. In one case (*D*), a significant difference in the rate of promotions was found, which was negligible for the other schemes. Data on basic wages suggested a positive change in two cases (*C* and *E*) and a negative in one (*D*), but in view of differences in renumeration systems between the various employers, these indicators were thought to be the least reliable (and have not been taken into account (in appendix C, table 11). Finally, in five out of six cases distances to work, travelling time or costs increased substantially with rehousing (table 4.3, main text). This may have had an impact on productivity but it is impossible to say to what extent. On the whole it must be emphasized that the proxies used measure productivity in a very partial way. Since no physical output data per worker combined with output prices per unit could be compiled, it was not possible to obtain even an impression of productivity gains accruing to the employer. This is very unfortunate because such gains clearly represent an externality. Productivity benefits accruing to the re-

20. An alternative explanation could be that increased payments for improved housing necessitated increased income. This again illustrates the earlier mentioned difficulty of controlling external variables.

housed households are internalized, as are increased transport costs to work, unless they are paid for by the employer.

B.5. HOUSING AND CRIME

B.5.1.. Introduction

The literature abounds with casual references to the association of squalid housing conditions with crime, but generally these notions are not well documented or supported by any empirical evidence.[21] This is also reflected in the general failure to recognize the two clearly distinct issues pertaining to this relationship. The first issue concerns differences in crime incidences in areas of different housing quality (irrespective of who commits these crimes), in other words: are crimes more likely to happen in bad housing areas than in good ones (other things being equal)? The second addresses the question of whether bad housing areas 'breed' crime (irrespective of where these crimes are committed) in other words, do delinquents originate proportionally more from such areas than from areas having superior housing conditions[22] (other things being equal)? The first aspect can be found in studies comparing views of residents in different areas[23] while the second viewpoint is often discussed in relation to the social ills of slums and squatter settlements (see e.g.

21. See e.g. Abrams (1964, p. 8), IBRD (1975b, p. 18), Jørgensen (1975, p. 41), Smith (1970, p. 219). Rothenberg (1967, pp. 54–60, 160–175) in discussing the social costs of slums referes to some exceptions to this pattern: a large number of (mainly American) empirical studies appeared during 1935–1955. However many of these studies failed to control for other important variables (see pp. 160–164, 170–172 and the bibliography listed by him on pp. 58–60).
22. Freedman (1975, ch. 5, pp. 55–60), who discusses the association between crowding and crime, seems to be mainly concerned with this aspect. However some of his examples clearly refer to the issue of incidences, which is somewhat confusing. The data presented in his study do not support the thesis that crowded housing conditions breed delinquency. (See also pp. 137–142).
23. See e.g. Yeh et al. (1972, pp. 104–105) and also: van Fleet (1970, pp. 232–250), who refers to several studies of housing conditions in different types of neighbourhoods in some Latin American cities. The study by Mangin quoted by him on p. 246 is one of the few examples giving some information on actual crime incidences in neighbourhoods of different housing quality. See also Golger (1972, pp. 173–174), who found a markedly lower crime rate in squatter areas than in government resettlement areas in Hong Kong.

Juppenlatz, 1970, p. 107). If bad housing conditions 'breed' crime this would imply that improved housing conditions should lead to lower overall crime rates (reduced crime 'propensity') and reduced costs of law enforcement. If on the other hand, crime incidences differ in areas having different housing quality (other things being equal), then one could say that improved housing conditions will improve the security situation of the residents and also leads to decreases in losses (physically or financially) resulting from changes in crime incidences in the area. This may have a bearing on the level of police protection necessary in that particular area. The data presented below on squatter areas and low-cost housing estates in Kuala Lumpur, Malaysia provide some evidence of interest to both hypotheses.

B.5.2. Differences in crime incidences

Differences in crime rates between areas can be expected to vary according to the differences in expected value of booty and in the estimated risks involved in committing these crimes (as determined by the chance of being caught and the consequences of being caught). These risks are smaller if opportunities to commit crimes are more common. For these reasons it is understandable that robberies and thefts occur most frequently in the central commercial area of a city, whereas the wealthier residential areas are more prone to housebreaking.

When examining common crime incidences in squatter areas and low-cost housing schemes, crime is looked at from the point of view of security of the residents (and their visitors) in each area. When people are relocated from squatter areas to low-cost flats it is important to know how the chances that they will suffer from crime will be affected. Opportunities to commit crimes in residential areas will be influenced by a number of factors such as:

—the physical conditions and design of the premises. It is clear that a house which can easily be broken into and that is designed in such a way that it offers possibilities of entering unobserved is more crime prone than a house that is superior in this respect (other things being equal);

—the lay-out of the area. An area in which it is easy to rob unseen and to flee easily would offer more opportunities than an area where this would never go unnoticed;
—the degree of social control in the area. It is likely that an area where the resident community is tightly knit would be less prone to common crimes than an area where interaction among neighbours is limited.

The above factors are internal characteristics of residential areas and are interrelated. In addition there is one external factor:

—the extent of police surveillance and its effectiveness. Tight and incorruptible police security clearly limits opportunities to commit crimes. It is quite possible that there are differences in this respect between various residential areas.

Comparing squatter areas and low-cost flats in these respects, one would not generally expect that there would be much difference in effective police surveillance. However it should be noted that in some high-rise, low-cost flats in Kuala Lumpur a sizeable number of units have been allocated in bulk to army personnel, the Police Field Force and personnel of other sections of the police force. This can be expected to act as a deterrent to crime in those areas.

One would expect that low-cost flats would be superior to squatter areas in respect of crime opportunities offered by physical conditions, design and lay-out of the area, although this may differ from scheme to scheme. With respect to social control one would generally expect that this would be stronger in squatter areas than in low-cost housing schemes, unless a group of squatter households is relocated in bulk into one scheme. Even then, however, the design of the scheme will determine to a considerable extent how effectively this control can be exercised.

The expected value of booty is not likely to vary much between squatter areas and low-cost housing flats. Socio-economic profiles of residents are similar (notably in income levels) as is shown in section 4.3.2 (main text), except for the police personnel resident

in some of the flats as mentioned above. The comparison between squatter areas and low-cost housing schemes below has been carried out with the aid of data supplied by the Kuala Lumpur Police Force on three selected quantitatively important types of common crime: robbery and gang robbery, theft and theft in dwelling, housebreaking and theft.[24] Data have been obtained on a number of squatter areas and low-cost housing schemes which were of sufficient magnitudes to be considered as entities on their own. The data covered the periods 1965–1968 and 1970–1973 (1969 was excluded since it was felt that the racial riots that took place in Kuala Lumpur on May 13th and their aftermath could possibly have biased comparisons for that year). Data for the later period provide the best basis for comparison since the number of low-cost housing schemes that could be included housed only slightly more than an average of 8,000 people in the earlier period compared with an average of 38,000 for 1970–1973.

As shown in table B.1, crime rates for all three types are lowest for low-rise flats, highest for high-rise flats, while crime rates in squatter areas are somewhat higher than in low-rise flats.[25] This pattern is similar for each individual year of observation. The correspondence between crime rates and building height confirms a similar pattern found in USA (see Newman, 1972, chapters 2 and 3, and also Freedman, 1975, chapter 10). Average value of stolen property is considerably lower in squatter areas (M$310) than in the flats

24. For Peninsular Malaysia these three broad categories of common crimes amounted to 4%, 61% and 21% respectively of all criminal offences reported to the police during 1968–1972 and 9%, 61% and 21% for Kuala Lumpur Federal Territory from 1973 to May, 1975. See Zainol bin Mahmood (1975, p. 35). It should be noted that only in the cases of housebreaking and theft and of theft in dwellings are residents exclusively the victims of crimes committed. In the case of robberies and other thefts this is only partially so.

25. All differences were significant ($p < 0.001$) between squatter areas and all low-cost flats, except in the case of housebreaking and theft. All differences between high-rise and low-rise flats were significant at this confidence level without exception, similarly between squatter areas and high-rise low-cost flats. Differences between squatter areas and low-rise flats were significant for housebreaking and theft as well as for all three crimes taken together ($p < 0.01$), but not for robberies etc. and thefts etc., not even at a much lower confidence level ($p < 0.05$).

TABLE B.1. Number of crimes per 1,000 population selected areas, Kuala Lumpur, annual average, 1970–1973

Areas	A. Robbery and gang robbery	B. House-breaking and theft	C. Theft and theft in dwelling	Totals (A + B + C)	Population (average 1970–1973)
Squatter areas	0.14	0.59	1.21	1.94	97,500
Low-rise low-cost flats	0.04	0.30	0.97	1.31	11,600
High-rise low-cost flats	0.78	0.91	4.37	6.06	26,400
All low-cost flats	0.55	0.72	3.33	4.60	38.000

(M$515).[26] This pattern is mainly the result of substantial differences for theft and theft in dwelling, the quantitatively most important crime in all areas. For robbery and gang robbery differences in amounts were substantial between squatter areas and low-rise flats, but the average value was five times higher in high-rise than in squatter areas. For housebreaking and theft the reverse pattern prevailed: the figure for squatter areas being highest, followed by that for low-rise flats.

The data for 1965–1968 show a similar pattern in that crime rates for all low-cost flats together appear to be somewhat higher than in squatter areas (although overall differences were much smaller than for 1970–1973) and in that levels for squatter areas were similar to those in the later years for all types of crimes. The small total number of units of low-cost flats in existence in the areas of observation during the earlier period did not allow extensive comparison between units of different building height. Unfortunately no data

26. Low-rise flats: M$670. High-rise flats: M$500. Difference between squatter areas and all flats, as well as between squatter areas and high-rise flats were significant ($p < 0.001$). Differences between squatter areas and low-rise flats were significant at a lower confidence level ($p < 0.01$), similarly between high-rise and low-rise flats ($p < 0.01$).

could be collected on crime incidences in low-cost terrace housing schemes. One would expect a somewhat more positive result for such schemes than for low-cost flats because social control can be expected to be more effective than in the flats, whereas other features governing crime opportunities would be similar to those for the flats.

Summarizing, it appears that social control would be a more effective deterrent to crime than improved physical construction of premises or resident police personnel, since it seems likely that diminished social control outweighed the other two factors in determining crime rates in high-rise flats. In low-rise flats social control apparently would not diminish to such an extent. Based on the above data for 1970–1973, the expected average annual losses per resident household can be calculated for each area (table B.2 assuming houshold size of 5.5).

As mentioned above, part of these losses are not incurred by the residents, but by others (i.e. in case of theft of a car parked at the housing estate but owned by a visitor). The data may point to differences caused by differences in housing environment. However, since no before-after, test-control study could be carried out, external factors influencing crime rates could only be controlled in a very limited way through the choice of the areas included. This may not have been sufficient. Notably the large differences found in the average value of stolen property cast some doubt in this respect, since such differences would not be expected in the face of residents' similarity in socio-economic profile. Moreover the above estimates are derived from data on crimes reported to the police. Obviously not all crimes are reported, therefore the data may not reflect the correct picture. To the extent that there are differences in the percentage of total crime reported between squatter areas and low-cost flats, the above estimates would be distorted. No evidence on this is available.

B.5.3 Differences in criminality

The hypothesis considered here is whether criminal offenders originate proportionately more from squatter areas than from other

TABLE B.2. Expected average annual losses per resident household.

Area	A. Robbery and gang robbery	B. House-breaking and theft	C. Theft and theft in dwelling	Totals (A + B + C)
Squatter areas	M$0.12	M$1.28	M$ 1.90	M$ 3.31
Low-cost, low-rise flats	M$0.06	M$0.51	M$ 4.25	M$ 4.83
Low-cost, high-rise flats	M$3.24	M$1.35	M$12.08	M$16.66

residential areas (more particularly from residential areas having similar income levels), indicating that squatter areas are crime breeding or used as hide-outs.[27] If this hypothesis can be accepted, squatter clearance and resettlement could still be a useful instrument in crime prevention in spite of the data found above on relative crime rates in squatter areas and low-cost housing schemes. Although crime rates in these areas would not be immediately affected, squatter resettlement would tend to reduce overall incidence of crime in the long run.

The below data on offenders charged with criminal offences committed in greater Kuala Lumpur may shed some light on the credibility of this hypothesis. Data on offenders' residences at the time crimes have been committed have been obtained from the Kuala Lumpur sessions court. Apart from the limited possibility of controlling for the external influences mentioned above, a major drawback of these data is that they cover only a small portion of crimes reported to the police because not all crimes reported are solved,[28] and of those solved insofar as the police are concerned,

27. This reflects current thinking in Malaysian government and police circles. See e.g. Ministry of Home Affairs, Malaysia (1973, p. 19), Sen (1973a, p. 8 and 1973b, p. 36). Zainol via Mahmood (1975, p. 34).
28. Police data for Peninsular Malaysia during the period 1968–1972 provide the following percentages solved: of all crimes reported, 34%; robbery and gang robbery, 29%; housebreaking and theft, 28%; theft and theft in dwellings, 34%; others, 48%.

some cases are not brought to court for lack of admissible evidence. In addition to that, as was discussed earlier, some crimes go unreported. Finally culprits of some crimes committed outside greater Kuala Lumpur area may well be living within that area. All in all these data on charged criminal offenders could well be the proverbial tip of the iceberg, but there are no more comprehensive data available.

Table B-3 summarizes the evidence for offenders charged with having committed a criminal offence in greater Kuala Lumpur. It should be noted that 17% of these offenders resided outside the greater Kuala Lumpur area at the time the crime was committed. For robbery, theft and housebreaking combined (the crimes discussed above) this figure is nearly 20%. The table indicates that squatter areas in general are not the crime nests which they are often accused of being but also that criminality among low-cost housing residents appears to be considerably lower. This could imply that squatter resettlement may have some positive overall effect on

TABLE B.3. Whereabouts of charged criminal offenders, greater Kuala Lumpur, annual averages (1970–1973).

Area of residence	Population (average 1970–1973)	Charged criminal offenders per 10,000 population	
		All criminal offenders[a]	Robbery, theft and housebreaking*
Squatter areas	204,100	9.3	4.5
Low-cost housing schemes	58,400	7.0	2.1
Remainder of greater Kuala Lumpur area	418,000	14.3	5.3
Total	680,500	12.2	4.8

[a]Differences between all areas were significant ($p < 0.005$ with reference to all criminal offenders, $p < 0.01$ with reference to robbery, housebreaking and theft).

crime prevention, but that improvement of housing conditions in other areas, e.g. slum-dwellers in central areas in Kuala Lumpur, emergency settlements such as the New Villages, and some of the older, dilapidated government quarters may be more effective in this respect.

Summarizing, it appears that overall crime prevention is not likely to benefit much from rehousing squatters into low-cost housing schemes. Incidences of crime were found to be higher in these schemes than in squatter areas. The hypothesis that squatter areas in general are particularly crime breeding could not be substantiated. However it should be stressed again that the data obtained, while the most comprehensive available, suffer from the serious weaknesses outlined above.

B.6. HOUSING AND FIRES

It is generally acknowledged that poor housing conditions pose considerable fire hazards and that improved housing may decrease these hazards and the concomitant damage (see e.g. IBRD, 1975b, p. 18; van Fleet, 1970, chapter V). Most references to fire hazards are made in studies of slum housing (see e.g. Rothenburg, 1967, pp. 55, 160–162, 164–168) and in discussing squatter problems in developing countries. Large fires have in fact occurred in the squatter areas of a number of major South-east Asian cities. Examples are Shek Kip Mei, Hongkong 1953 (50,000 homeless) and 1954 (Johnson, 1966, p. 644; Golger, 1972, p. 173), when 58,000 were made homeless, Gombak Lane, Kuala Lumpur, 1956 (2,000 homeless; Kuppusamy, 1969, p. 8), Bukit Ho Swee, Singapore, 1961 (16,000 homeless) and 1968 (Housing and development Board, Singapore, 1970, pp. 8–9; Kleevens, 1972, p. 8), and Tondo, Manila, 1971 (Taylor, 1973, p. 8).

What all these major fires seem to have in common is that once such a fire starts off in a squatter area it spreads very rapidly due to the high density of the houses and the inflammable materials that

often constitute the larger part of squatter housing (notably untreated timber and thatch). For that reason damage often seems to be much greater than in the case of fires in other residential areas. This is compounded by the sometimes limited accessibility of squatter areas for fire engines. The following is a typical illustration of these problems in Kuala Lumpur, Malaysia.

Sixty-six people lost their homes this afternoon in a fire in Kampong Paya, about 200 feet beyond the railway running parallel to Jalan Bungsar. The fire broke out in a house at about 2.45 p.m. Fanned by a slight wind, it spread rapidly to 14 other houses before the arrival of six fire engines. More than 50 firemen fought the blaze for about 30 minutes. They could not save the 15 houses, but were able to prevent the fire from spreading further. Most of the victims had hardly any time to salvage their belongings. There were no casualties[29].

When comparing incidences and consequences of fires in residential areas of different housing quality, the necessity to control for other variables is much less pressing than in the case of the earlier mentioned studies on health, education or crime, since the pattern of causation is much more straightforward than in those fields. It may be useful to control for the social profile of residents, since differences in cooking habits and domestic behaviour generally may cause differences in fire incidences. These things being equal, one would expect that small domestic accidents will lead to a fire more often in fire-prone housing conditions than in improved housing. A much larger differential can be expected in the extent of damage and the fire department efforts necessary to control and extinguish the fire. The data presented below, in which socio-economic profiles of residents have been controlled by comparing squatter areas and low-cost housing schemes (where many residents are rehoused squatters), provide some evidence of these aspects for Kuala Lumpur, Malaysia.

Data on fires in squatter areas and low-cost housing schemes within municipal Kuala Lumpur have been obtained from the Kuala Lumpur Municipal Fire Department, which maintains compre-

29. New Straits Times (Malaysia), August 31, 1974. The settlement referred to is by no means the densest or most inaccessible squatter area in Kuala Lumpur.

hensive records on all fires attended since 1965. Data have been extracted for 1965–1973 and are summarized in table B.4, excluding data for 1969 which were thought likely to bias comparison (a large number of arson cases were reported in squatter areas in the aftermath of the 13 May events).

The data seem to support the hypotheses outlined above. This would suggest that rehousing squatters into low-cost housing areas may entail substantial savings, both to the households concerned and to the municipality. Assuming for the moment that the observed differences hold for rehousing (an assumption not too questionable in the case of fires) these savings can be calculated. Average annual property losses would be reduced by M$2.94 per unit or M$880 for a hypothetical scheme of 300 units. Assuming a man-hour cost per fireman of M$2.00 and an engine-hour cost of M$25.00, annual savings in utilization of fire services are negligible, amounting to slightly more than M$9.00 for such a scheme. Thus in monetary terms both internal and external benefits are small on this count.

TABLE B.4. Fires in squatter areas and low-cost housing schemes, municipal Kuala Lumpur, annual averages, 1965–1973[a]

Area and number of units	Number of fires per 10,000 housing units	Amount of losses per fire	Number of firemen attending per fire	Number of fire-engines attending per fire	Time spent in extinguishing fire
Squatter areas (19,100)	6.36	M$4,680	11.6	1.6	57 min.
Low-cost housing estates (6,100)	4.30	M$90	6.8	1.0	29 min.

[a]Excluding 1969. Differences were significant in all cases ($p < 0.02$) except in case of number of fires per 10,000 units, where differences were significant only if a much lower level of confidence is accepted ($p < 0.1$).

This is mainly the result of low overall incidences of fires in the areas discussed. Of total fire incidences in Kuala Lumpur, some are in other areas and a substantial number are totally unrelated to the built-up municipal area, typical examples occurring frequently being bush fires and short-circuits in cars.

Appendix C. Estimates of costs and benefits for all schemes

C.1. AGGREGATE CONSUMPTION COSTS OF REHOUSING SQUATTERS (PROJECT INPUTS)

C.1.1. Introduction

Aggregate consumption costs of a project are constituted by the goods and services withdrawn from the rest of the economy that would not have been withdrawn in the absence of the project, valued at the public's willingness to pay for them (accounting prices). Where this willingness to pay differs substantially from the market price for these goods and services, costs at market prices need to be adjusted by the ratio of total costs at accounting prices to total costs at market prices (accounting ratio) in order to reflect national economic costs. This accounting ratio in turn depends on the A.R.'s for each factor input (as estimated in chapter 5) and the amounts of each factor input used (at market prices) in each project.

To arrive at a valuation of all input costs at accounting prices it should be ascertained whether the housing projects studied have reduced supply of these inputs available to the remainder of the economy or whether the projects have given rise to as expanded supply of any one input, leaving supply of this input to the rest of the economy unaffected. In the latter case, the input costs are the resources used to expand this input supply (see appendix A, section 5.1).

The housing schemes studied (ranging from 175 to 440 units and from M$1 million to M$2.4 million construction costs at current market prices) constitute only a very small proportion of total construction output in the formal sector. Annual output value of contract construction in Peninsular Malaysia grew from M$448.4

million in 1966 to M$709.8 million in 1972 at current prices.[1] Thus it appears that the amount of inputs used in the projects is quite small compared with the competing demands for these inputs within the construction industry. In addition to that, competing demands from other industries (and from own-account construction activities carried out in the informal sector) exist for a number of inputs.

Therefore it can be safely assumed that it is unlikely that domestic production of major inputs used in the housing schemes has actually been increased as a direct consequence of the increased demand for these inputs resulting from the projects. It is much more likely that use of these inputs by the projects has reduced their availability to the rest of the economy or that the inputs have become available either through additional imports or as a result of reducing exports. In the latter two cases domestic supply is increased by the amounts demanded by the project at the cost of foreign exchange, and availability of physical inputs for the rest of the economy remains unchanged. Since nearly all types of materials and equipment used in the construction industry are imported or exported (sections 3.3.4 and 3.3.5, main text), it has further been assumed that use of these inputs has not reduced their domestic supply to the rest of the economy but that they have been obtained either through an increase in imports or a reduction of exports, directly or indirectly.

In subsequent sections, costs and benefits are expressed in constant 1973 prices. The choice of that particular year as a basis is, of course, arbitrary, and is entirely governed by reasons of convenience: most estimates of costs and benefits have actually been provided at 1973 prices. This means that items expressed in prices of earlier or later years have to be adjusted for differences in the general price

1. Department of Statistics Survey of Construction Industries, 1972, table A1.1, p. 37. This survey covers construction carried out by contractors having an annual output of M$100,000 or more. Comparison with the 1970 input-ouput data suggest that in that year these large formal sector contractors accounted for 43.8% of total construction output; 7.7% is accounted for by small contractors' output, while the remaining 48.5% consists of (imputed) own-account (informal sector) construction and government construction classified in the survey as outside the industry proper.

level between those years and 1973 before inclusion in the CBA calculations. For lack of anything better the general consumer price index, Peninsular Malaysia, or one of its component parts has been used for this purpose in all cases where such a correction was necessary, except in the case of construction costs, for which a price index of residential construction (government projects)[2] has been used.

C.1.2. Construction costs of housing schemes

Cost data have been supplied by Kuala Lumpur Municipality and Selangor State Economic Development Corporation (P.K.N.S.) for the schemes built for these authorities respectively. While these data are comprehensive, no details on factor costs could be supplied by the authorities, mainly because the overwhelming part of construction operations is being undertaken on a contract basis by one or more main contractors (if more than one, there are generally separate main contracts for drains and sewerage, for piling – if necessary – and for superstructure). The main contractor in turn would generally tender out specific jobs to sub-contractors. The costs provided by the authorities therefore provide details on specific building operations at best. Construction costs data at current market prices represent the costs incurred by the authorities and their overheads charged to the projects (with the exception of capitalization of interest, since this will be taken into account in the discounting process).

Because of the impossibility of obtaining construction costs broken down to primary factor inputs from the authorities, an attempt has been made to obtain this information from the various main contractors involved in constructing the projects. No additional data were obtained in this way, so the split-up of construction costs into primary factor inputs at market prices has been estimated in an indirect way, based on discussions with architects, quantity surveyors, and engineers on the cost figures provided and,

2. Calculated by the author from the weighted price index of construction materials (residential construction) prepared by the Department of Statistics and a weighted labour cost index obtained from the Public Works Department.

where available, on an evaluation of the bills of quantities of the major contracts. These estimates resulted in a cost split into the following broad components:

—unskilled labour (on site)
—semi-skilled labour (on site)
—skilled labour (on site)
—materials used
—equipment used
—profits (before direct taxes)
—overheads (including indirect taxes)

The cost proportions estimated have been checked for consistency with the aid of data from the Surveys of Construction Industries. These data, and the 1970 input–output tables, have also been used to split further the categories of materials, equipment and overheads, in order to arrive at the primary factor proportions of con-

TABLE C.1. Construction costs in M$ (constant 1973 prices).

Year costs incurred	1966	1967	1968	1969	1970	1971	1972
At market prices							
Scheme *A*	–	538,500	2,231,500	169,900	–	–	–
Scheme *B*	–	–	–	249,700	2,274,700	583,100	7,800
Scheme *C*	–	13,000	925,300	485,400	147,800	6,000	–
Scheme *D*	–	98,700	68,600	269,300	306,700	582,000	29,900
Scheme *E*	–	–	–	–	1,199,900	424,600	–
Scheme *F*	165,300	263,400	1,677,400	226,900	395,800	473,400	25,000
At accounting prices							
Scheme *A*	–	441,000	1,835,400	145,200	–	–	–
Scheme *B*	–	–	–	212,300	1,865,500	481,600	7,500
Scheme *C*	–	10,900	738,200	397,300	122,300	5,000	–
Scheme *D*	–	63,300	54,500	202,100	243,600	451,600	23,200
Scheme *E*	–		–	–	912,600	332,600	–
Scheme *F*	162,100	237,000	1,297,800	187,100	319,500	385,900	19,600

struction costs.[3] Table C.1 provides an overview of construction costs (in constant 1973 prices) at market and accounting prices (applying the A.R.'s estimated in chapter 5). While the procedure used doubtless suffers from inaccuracies and some arbitrary apportioning had to be resorted to, the lack of data on specific factor inputs used precluded better estimates.

C.1.3 Land costs

Table C.2 summarizes the available evidence on land costs for each scheme. Although actual payments for land in several cases have been made only during or after construction of the housing schemes, it will be assumed in the calculation of opportunity costs of land that these costs apply from the moment that alternative use is no longer possible. This would generally be upon approval of the land title for the schemes. For convenience sake it is assumed that this approval is granted in the year that construction activities commenced.

In the cases of schemes *A* and *B* (two phases of the same project) the most likely land use in the absence of the project would have been agriculture (palm oil). The project area is bordered by oil palm estates on two sides and a semi-urban residential area (Pandamaran New Village) on the other two. The purchase price was based on agricultural use. In the absence of the project, it is not likely that a change in land use would have been allowed. However the purchase price may have understated the commercial value, since the Selangor state government was probably in a position to use its compulsory acquisition power, if not in reality, at least as a bargaining instrument. It appears therefore that a price of M$0.12 p.s.f. (1967 prices) may be a fair estimate of the opportunity costs of land. The price of M$0.32 is most certainly too high, because this price takes into account that squatters have already been cleared from the project area. As this is already included in construction costs (40 units of temporary houses were erected for the squatters, who eventually were also rehoused in the schemes) it should not be taken

3. For details on the exact procedure used see Wegelin (1975, pp. 62–67).

into account again. Moreover this price also assumes a conversion of title to have taken place, which would not have happened but for the project.

Concerning the land used for scheme *C*, the most likely alternative use would have been low-density residential development, since the state government intended to provide inexpensive housing for workers in the nearby industrial sites in Petaling Jaya. The premium that had to be paid to the state government for such development would have been approximately M$0.40 p.s.f. in 1967. This figure appears to be rather low, especially if compared with figures for land at the site of scheme *D*, which had similar alternative development potential, but is more centrally located. However, in 1967, site *C* was at the very fringe of the Kuala Lumpur-Petaling Jaya conurbation and land values for low-density residential use would have been quite low at that time. Therefore the opportunity costs of land for scheme *C* will be put at M$0.40 p.s.f.

Similarly, for scheme *D*, the costs of M$0.80 p.s.f. (1969 prices) seem to be a reasonable estimate. Costs of clearing squatters from

TABLE C.2. Estimates of land cost per sq. ft. (M$).

Housing scheme	Gross area in acres[a]	Price paid per sq. ft. (if applicable) and nature of price[b] (year of payment in parentheses)	Estimated value[c] per sq.ft. prior to development (relevant year in parentheses)
A	30.038	C: 0.06 (1969)	A: 0.12 (1967) before development. A: 0.32 (1968) before development but with potential for terrace houses.
B	29.454	C: 0.07 (1972)	A: 0.12 (1967) before development A: 0.32 (1968) before development but with potential for terrace houses.
			A: 0.40 (1967) based on premium usually paid to the

TABLE C.2. (continued)

Housing scheme	Gross area in acres[a]	Price paid per sq. ft. (if applicable) and nature of price[b] (year of payment in parentheses)	Estimated value[c] per sq.ft. prior to development (relevant year in parentheses)
C	27.57	n.r.	state government.
D	3.276	n.r.	A: 0.80 (1969) with squatters on the land. A: 1.80 (1969) after clearance of squatters but before development.
E	6.0	N: 0.12 (1970)	A: 0.60 (1971) before clearance of squatters. A: 1.80 (1971) after clearance and approval for 4-storey low-cost flats. B: 1.84 (1971)
F	0.986	n: 2.69 (1966–1971)	A: 5.00 (1967) approval for multi-storey building. B: 3.50 to 4.00 (1966) based on undivided land zoned as residential for 60 persons per acre.

[a]Including internal roads, drain reserve, electricity sub-station reserve, community services reserve, green belt and playing field reserves, if applicable.

[b]C = Commercial price; N = Nominal rate; n.r. = not relevant (this applies in cases where P.K.N.S. built on Selangor state land).

[c]A = Valuation by UDA; B = Valuation by other source (Kuala Lumpur Municipality). Imputed land costs used in the financial analysis (potential cash flows) in chapter 6 are as follows:

A: M$ 94,400 (1969)	*F*: M$108,700 (1966)
B: M$102,100 (1972)	M$ 20,600 (1967)
C: M$564,000 (1967)	M$ 3,200 (1968)
D: M$134,800 (1969)	M$ 6,300 (1970)
E: M$ 36,300 (1970)	M$ 900 (1971)

the project site have been taken into account in construction costs (site works) and should not be accounted for in the land costs again. Land in the project area was zoned for residential use at a maximum density of 20 persons per acre, so no other use but low-

density residential would have been possible in the absence of the project.

In the case of project *E* costs of squatter clearance from the project site has not been incorporated in the construction costs. Land was zoned for residential use at a maximum of 60 persons per acre. Even in the absence of the project it is likely that medium density housing would have been built. Therefore the price of M$ 1.80 p.s.f. (1971 prices) seems to be appropriate as an approximation of the opportunity costs of land in this case.

Scheme *F* has a fairly central location. At the time the project was initiated, the project area land was zoned as residential, maximum 60 persons per acre, so in 1966 the most likely alternative development would have been medium-density housing. For that reason, it seems best to assume an opportunity cost of land in its best alternative use in line with estimate *B* at M$ 3.50 p.s.f. (1966 prices).

The resulting opportunity costs of land are shown in table C.3. The conversion from current prices to constant 1973 prices has been carried out with the aid of the consumer price index for lack of a general price index of urban land. It is felt that this adjustment is likely to understate changes in land values (however this would not affect the outcome of the CBA substantially, since land costs are non-recurrent). There is a clear need for the construction of a land price index. The necessary data for this are available in various government departments[4] but a major problem is that differences between price indices of land for different areas can be expected to be much larger than for any other type of commodity, since land values in any area typically depend on development constraints in that area, which of course differ widely between areas and over time.

The government has only incurred a cash-outflow for land in the cases of schemes *A* and *B*. In constant 1973 prices these amounts are M$ 94,400 (paid in 1969) and M$ 102,100 (paid in 1972) respec-

4. An attempt to construct such an index for Kuala Lumpur during 1961–1972 has, in fact, been made by UDA's research and development division. However this attempt, while conceptually sound, suffered from a small sample size (except for the very central area) and a very limited valuation data base, which necessitated substantial interpolation and extrapolation. For these reasons those data have not been used in the present study.

TABLE C.3. Opportunity costs of land in M$ (constant 1973 prices).

Year incurred	1966	1967	1968	1969	1970
Scheme *A*	–	184,300	–	–	–
Scheme *B*	–	180,800[a]	–	–	–
Scheme *C*	–	564,000	–	–	–
Scheme D	–	134,800[b]	–	–	–
Scheme *E*	–	–	–	–	536,800[2)]
Scheme *F*	184,300	–	–	–	–

[a]Although the initial year of construction for scheme *B* was 1969, land for schemes *A* and *B* had been earmarked by the state for low-income housing at the same time and alternative use could be considered no longer possible once this decision had been taken.

[b]Valuations for scheme *D* pertained to 1969 and for scheme *E* to 1971, although initial years of construction activity were 1967 and 1970 respectively. This has been taken into account in the inflation adjustment.

tively. In the calculation of financial returns the government is treated as a monolithic entity, so for schemes *E* and *F* no direct cash outflow from the government applies, since in these cases the land premium was paid by one government body (Kuala Lumpur Municipality) to another (Selangor state government). For schemes *C* and *D* no land alienation applies since a state government body (PKNS) built on state land in those cases.

C.1.4. Operating costs of housing schemes

Operating costs of the schemes should include the reduction of resource availability elsewhere in the economy as a consequence of operating the housing schemes, valued at the willingness to pay for these resources foregone. Operating costs incurred by the public bodies responsible for management and maintenance of the scheme can serve as a convenient point of departure, supplemented by those costs (if any) borne by the occupants of the housing units (for detailed cost estimates, see Wegelin, 1975, appendix 7, pp. 241–246).

The nature of operating costs varies with the type of housing development as could be expected. For terrace housing schemes annually recurrent costs primarily consist of costs of unkeep and repair of roads, drains and sewers as well as garbage collection. For flats, items such as public lighting, cleaning of public spaces like corridors and staircases are of major importance. Administrative over-

heads are larger for rental schemes *D*, *E* and *F* than for hire-purchase schemes *A*, *B* and *C*. On the other hand, in the rental schemes the occupant does not incur any operating costs, whereas in the hire-purchase schemes the owner-occupant typically has to pay for internal repairs (and fire insurance, once his housing loan has been repaid in full to P.K.N.S.) as well as quit rent and assessment rates. Quit rent is the annual payment to be made to the state government for the lease of the housing lot. Assessment rates are levied by the local authority as a charge for various municipal services (e.g. public lighting, garbage and night-soil collection, etc.). Since quit rent and assessment rates do not adequately reflect the sacrifice of real resources, it is felt that it is better to estimate land costs (see previous section) and costs of municipal services provided directly (which has to be done anyway for the rental schemes where such payments are not levied). Payment of quit rent and assessment rates are thus not regarded as aggregate consumption costs, but as pure transfer payments, having distributional implications only. In the financial analysis of course, they are included as revenue to the government along with rents and instalments paid.

All estimates have been provided in 1973 prices. To estimate annual operating costs at accounting prices is a very difficult task in view of the heterogenous items included. For that reason, and because with the exception of the A.R. for unskilled labour, all major A.R.'s are not far from unity, only the unskilled labour component in annual

TABLE C.4. Annual operating costs in M$ (1973 prices)

Scheme	At market prices (A)	Unskilled labour component (B)	At accounting prices (A − B)
A	62,800[a]	41,300	21,500
B	52,200[b]	32,900	19,300
C	43,100[c]	21,800	21,300
D	17,500	7,100	10,400
E	29,400	8,900	20,500
F	51,500	12,200	39,300

[a]of which M$7,600 initially has to be paid for by the owner occupants; after expiration of P.K.N.S. loan period an additional M$3,800.
[b]ibid. M$6,100 and M$3,600 respectively.
[c]ibid. M$4,700 and M$4,000 respectively.

operating costs has been identified and subtracted (the A.R. for unskilled labour being zero) to provide a rather cautious estimate of operating costs at accounting prices (table C.4).

Non-annually recurrent costs include costs of periodical painting or whitewashing and, in case of the terrace housing schemes, periodical resurfacing of roads, all presumed to take place once every five years. For schemes *A*, *B* and *C* the costs of periodical painting are borne by the owner-occupants. Non-recurrent operating costs apply to the schemes *A* and *B*, where, due to an error in planning the schemes, drainage was found to be inadequate and internal roads were also thought to be substandard. Upgrading of roads and drains thus brought additional costs in 1974 (table C.5). The accounting ratio for periodical painting, resurfacing of roads, upgrading of roads and drains is assumed to be 0.80, the approximate average accounting ratio for construction costs of all schemes.

It is not unlikely that some components of operating costs (notably repairs) will increase in real terms as the schemes deteriorate physically over time. This has not been taken into account in the data as such. However, sensitivity analysis is carried out in which annual amounts of operating costs are varied $\pm 20\%$ of actual value to check how such changes affect the viability of the schemes.

The above data on actual operating costs have been obtained at considerable effort. To save time and money, actual maintenance costs are sometimes approximated in project appraisal by a fixed amount of depreciation.

C.1.5. Costs of relocating squatters

As mentioned in section 4.2.2, the relevant cost items here are demolition costs of structures, value of structures demolished and removal costs of squatters.

C.1.5.1. Demolition costs

These costs naturally vary with the type of structures to be demolished and the nature of land upon which the squatter houses have been built. Data on these costs have been obtained from Kuala Lumpur Municipality concerning 397 squatter households whose houses have been demolished in 1971 and 1972 (number of house-

TABLE C.5. Non-annual operating costs in M$ (1973 prices)[a]

Years incurred	1974	1975	1976	1977	1978	1979
At market prices:						
Scheme *A*	172,700[b] (10,900)	–	–	–	–	43,700 (10,900)
Scheme *B*	128,800[c]	–	8,700 (8,700)	–	–	24,700
Scheme *C*	–	26,700 (6,700)	–	–	–	–
Scheme *D*	–	–	6,700	–	–	–
Scheme *E*	–	–	4,700	–	–	–
Scheme *F*	–	–	24,200	–	–	–
At accounting prices:						
Scheme *A*	138,200[d] (8,700)	–	–	–	–	34,900 (8,700)
Scheme *B*	103,100[e]	–	6,900 (6,900)	–	–	19,800
Scheme *C*	–	21,300 (7,000)	–	–	–	–
Scheme *D*	–	–	5,300	–	–	–
Scheme *E*	–	–	3,800	–	–	–
Scheme *F*	–	–	19,300	–	–	–

[a]figures in parentheses indicate the amounts borne by owner-occupants.
[b]of which M$161,800 is non-recurrent.
[c]non-recurrent.
[d]of which M$129,500 is non-recurrent.
[e]non-recurrent.

holds affected: 158 and 239 respectively). Out of the households evicted in 1971, 100 families accepted a low-cost flat in scheme *E*, while out of those evicted in 1972, 174 households accepted a flat in project *F*. Average costs per household affected were M$7.80 and M$15.50 respectively (current prices). Costs consisted of the following components: wages (78.0%), materials (5.5%) and equipment (16.5%). In the case of scheme *D*, no estimates could be obtained, while concerning schemes *A* and *B* in many cases the local authority did not have the squatter houses demolished after the occupants had been rehoused. This resulted in their re-occupation by others,

mainly relatives of the relocated squatters. In the case of scheme *B*, a large number of rehoused households have been resettled from Quarantine Camp, Port Kelang, where they had been housed in dilapidated brick barracks. Costs of demolition here averaged M$ 51.00 (1972, current prices) per affected household (393 households were involved), incurred by Port Kelang Authority.

As has been mentioned earlier, project *C* has not been explicitly used for squatter rehousing, so no demolition costs applied. However, for the sake of comparability of the schemes it will be assumed that demolition has taken place in all cases. The figure for Quarantine Camp will be ignored: the structures there were made out of brick and are considered atypical of squatter housing. The figures for schemes *E* and *F* in constant 1973 prices per household are M$ 9.00 and M$ 17.00 respectively, providing an average of M$ 14.00. For these projects the actual costs incurred (1973 prices) will be taken into account, while for the other projects the average figure of M$ 14.00 per affected household will be assumed.

The approximate accounting ratio for construction of 0.80 will be used to provide costs at accounting prices, which, in view of the large labour component (of which a sizeable part can be expected to be unskilled), is a somewhat cautious assumption.

C.1.5.2. Value of structures demolished

Data on these could not be obtained from the authorities involved in rehousing the squatters. Therefore questions referring to this have been incorporated in the questionnaire used in interviewing test (rehoused squatters) and control (non-rehoused) groups' households. Since it was felt that a direct question relating to the value of their demolished house would most likely produce biased replies, questions related to the investment in the squatter house at the time it had been bought or built by the squatter household concerned, period of ownership and, in the case of the test group, whether the household had managed to sell any parts of the house prior to demolition, and if so, for what amount.

These data, of course, cannot be thought to be very accurate, as the respondents were asked about amounts they spent several years

prior to the interview (sometimes as much as twenty years previously). However the data can be considered adequate for the purpose of obtaining the order of magnitude of what the house had cost them. The period of ownership prior to demolition coupled with an assumption on the lifetime of a squatter house (estimated here at 20 years) makes it possible to estimate roughly the value of the structure at the time of demolition by applying a straight line depreciation.

Subtracting the estimated average value of salvaged parts of the house sold by the squatters prior to demolition (only 13.3% of the rehoused households had been able to sell any parts of their house at an average value of M$ 70 – this works out at approximately M$ 9 on average (for all households), the resulting net average values found (in 1973 prices) are:

scheme *A* – M$ 620
scheme *B* – M$ 357
scheme *C* – M$ 390 (average of the other five schemes)
scheme *D* – M$ 268
scheme *E* – M$ 554
scheme *F* – M$ 153

The value at accounting prices is assumed to equal reported value at market prices, assuming that these prices in fact reflected the willingness to pay for squatter housing adequately.

C.1.5.3. Removal costs of squatters

These costs are generally born by the households involved, except for squatters who move into Kuala Lumpur municipal flats from an area to be demolished by the local authority. In such cases the municipality provides free transport for their removal. Nevertheless some households incurred substantial additional transport costs in excess of the facilities provided by the municipality. The following figures apply per affected household (constant 1973 prices):

scheme *A* – M$ 24
scheme *B* – M$ 27

scheme *C* – M$18
scheme *D* – M$ 8
scheme *E* – M$17 (of which M$12 incurred by the municipality)
scheme *F* – M$34 (of which M$17 incurred by the municipality)

It is assumed that the prices paid for transport services reflect the willingness to pay for these services adequately. Costs at accounting prices therefore equal costs at market prices.

C.1.5.4. Other relocation costs

An additional cost to Kuala Lumpur Municipality and P.K.N.S. is the rent subsidy these authorities provide to rehoused squatter households in rental schemes. A rent subsidy amounting to 100% of the regular monthly rent during the first 3 months of occupancy and 50% during the ensuing 21 months is provided by the municipality to squatters evicted under the Essential (Clearance of Squatters) Regulations, 1970 and rehoused in municipal flats. In scheme *D*, P.K.N.S. provides a 100% rent subsidy during the first two months of occupancy to all rehoused squatters. For a three-roomed flat (fixed monthly rent of M$55) these subsidies amount to M$467.50 and M$110.00 respectively (disregarding capitalization of interest). It is sometimes suggested that these subsidies should be viewed as compensation payment for the demolition of the rehoused households' houses and for the psychological effects upon the families concerned. These subsidies will not be taken into account here: no use of real resources is involved, consequently there are no aggregate consumption costs. Of course these transfers have a redistributional impact. (see section 3).

Table C.6 summarizes total relocation costs involved, assuming that all rehoused households in each scheme originated from squatter areas where their houses were demolished. The table indicates that total relocation costs are considerable and depend crucially on the estimated value of the squatter houses at the time of demolition.

TABLE C.6. Total relocation costs in M$ (constant 1973 prices).

Scheme	Year costs were incurred	Number of households involved	Total relocation costs		Of which incurred by the government	
			At market prices	At accounting prices	At market prices	At accounting prices
A	1969	436	286,900	285,600	6,100	4,800
B	1971	329	130,900	130,000	4,600	3,600
C	1970	266	114,600	113,800	3,700	2,900
D	1972	174[a]	52,200	51,700	2,400	1,900
E	1971	320	185,600	185,000	6,700	6,100
F	1972	396[b]	80,800	79,600	13,500	12,300

[a] two units in the scheme have been used for non-residential purposes.
[b] four units in the scheme have been used for non-residential purposes.

C.2. AGGREGATE CONSUMPTION BENEFITS (PROJECT OUTPUTS)

C.2.1. Value increases of cleared sites

The increase in value of land cleared of squatters and neighbouring sites depends on the willingness to pay for the increased development potential of the land caused by squatter clearance. As discussed in section 5.3.4, the development potential of urban land is restricted by land-use and density zoning and these limitations should be taken into account. Apart from that the extent of increase in value can be expected to depend on factors like the location and physical nature of the land concerned.

Valuation reports have been prepared by UDA's valuation section for twelve areas from which residents have been relocated into the housing schemes studied. For some areas in Kuala Lumpur similar reports were available from other sources. Apart from the above considerations these reports took into account transactions concluded in the vicinity of the cleared sites and endeavoured to isolate the effects of site improvement and general rise in land values so as to arrive at the increase in value that could reasonably be attributed solely to clearance. Where reports are available from more than one source there was generally little difference in the estimates, en-

hancing their reliability. The estimated increases in value for the cleared sites attributable to clearance range from zero to M$2.00 p.s.f.[5]

In order to assess the absolute amounts of increase in land values as a consequence of rehousing the households from the above areas into the housing schemes studied, average value increase per household has been calculated for all areas. This not only depends on the value increase p.s.f., but also (inversely) on household density per acre. These densities differ considerably, depending on the location and physical nature of the occupied land and on the type of squatter settlement. For that reason it was felt necessary for each project to impute a norm value increase per household, depending predominantly on values for those areas in which the majority of the households rehoused in the project lived prior to rehousing (for further details, see Wegelin, 1975, pp. 94–97).

Where cleared land is not state-owned but in private hands, the

TABLE C.7. Value increase of cleared land as a consequence of relocating squatters in M$ (constant 1973 prices).

Scheme	Norm value increase per household	Total value increase	Year of relocation
A	2,010	876,400	1969
B	420	138,200	1971
C	2,020[a]	537,300	1970
D	2,920	513,900	1972
E	3,420	1,094,400	1971
F	1,330	532,000	1972

[a]Average value for the five other schemes. Although no actual squatter clearance has taken place in this case, clearance has been assumed (as in the previous section) for the sake of comparison.

5. The reports also indicated that values of surrounding properties were not affected by squatter clearance: in no case was actual development potential of surrounding areas directly influenced by this clearance. However in practically all cases it could be argued that clearance would improve long-term development potential in the area indirectly and consequently would exert a price raising influence on land values. Similarly it could perhaps be expected that construction of low-income housing schemes would tend to influence surrounding land values. However no evidence of such indirect influences has been found and for that reason such externalities are not included in the CBA calculation.

landowner would benefit rather than the government, at least to the extent that the increase in land value is not taxed by means of betterment charges or similar measures. However all cleared lands were state-owned except in the case of scheme *A*, where approximately two-thirds of rehoused households were relocated from private land. Estimated average value increases for these private lands were approximately 40% higher than for the state land involved. This implied that in the case of scheme *A* around 74% of the total value increase accrued to private landowners,[6] whereas in all other cases value increases accrued to the government.

C.2.2 Welfare benefits (direct and indirect) to the occupants

Direct welfare benefits of the housing schemes studied consist of the level of amenities provided by the schemes to the rehoused squatters in terms of tenure, space, water supply, electricity supply, sanitary facilities, location and environment. These (as well as the changes caused by rehousing in this respect) have been described at some length in section 4.3.3.1.

In addition to that, some indirect welfare benefits may apply, some of which are recurrent themes in pleas for more or higher quality housing. These indirect effects are all related to human behaviour (in contrast to the direct effects which exclusively concern the availability of physical amenities) in the sense that they influence the occupants' actions or ameliorate undesirable consequences of such actions. Of these, some of the more popular contentions are that improved housing leads to improved health, lower crime rates and fewer fires. Sometimes it is also held that improved housing leads to higher productivity at work and in school. In appendix B these aspects are discussed at some length, comparing data from case-studies carried out elsewhere to the data on squatter

6. It is not known to the present writer whether these landowners had to pay any compensation to the government for squatter clearance (for which legal provisions exist), but those evicted squatters who did not accept a house in scheme *A* have been financially compensated by the landowners to the extent of M$1,300 per house (presumably including compensation for the demolition of their house, removal costs and for the inconvenience caused).

rehousing collected in Peninsular Malaysia, with the aim of quantitatively verifying the above claims.

However, what must be recognized concerning direct benefits and almost all indirect benefits or drawbacks mentioned above, is that they affect only the occupants of the housing schemes themselves. This means that, assuming the occupants perceive all these benefits or drawbacks as such, they would generally take this into account in determining what amount of money they would be willing to pay as monthly rent or purchase price for their house. The plausibility of this assumption is obvious enough for the direct benefits and some indirect effects (e.g. increased transport costs), but somewhat more questionable for benefits such as increased productivity and improved school performance. Be that as it may the above assumption will be maintained below, implying that all those effects are incorporated in the occupants' willingness to pay for housing.

Of course this does not apply to those benefits or costs accruing to/incurred by the government or a third party. To the extent, for instance, that utilization of health care paid for by employers is reduced as a result of rehousing, such benefits do not accrue to the rehoused households, but to the employers concerned and should be added as a 'spillover' effect (see section 2.3 below).

If conditions of competitive buying (no rationing or other restrictions or monopoly buying power) apply and if the projects can also be assumed to be too small to influence the market price for housing services, the market price can be assumed to be equal to the willingness to pay and consequently would reflect welfare benefits adequately (see appendix B, section 5.1). The A.R. for occupants' welfare benefits would then be unity.

Although the second requirement applies (it is hardly conceivable that the projects studied have influenced overall market prices of housing services in view of their relative small size), conditions of competitive buying do not prevail concerning government low-cost housing. Eligibility for federally funded schemes is limited by household income level and household size. Moreover, priority is given to victims of natural disasters such as floods and to squatters

TABLE C.8. Rentals and sales revenue in M$ (1973 prices).

Scheme A (436 units)

Average per unit:		Total:	
Selling price:	5,271	Sales:	2,298,200
Down-payment:	429	Down-payments:	187,100
Annual instalment:	444	Annual instalments:	193,600
Repayment period (average): 16.4 years		Quit rent and assessment rates per annum:	47,300
Interest rate charged: 4%		First year of operation: 1969	

Scheme B (329 housing units and 18 shops)

Average per unit (houses):		Total (houses):	
Selling price:	6,083	Sales:	2,001,300
Down-payment:	728	Down-payments:	239,500
Annual instalment:	576	Annual instalments:	189,500
Repayment period: 15 years		Quit rent and assessment rates per annum:	35,700
Interest rate charged: 5.1% (7.5%)*		First year of operation: 1971	
Average per unit (shops):		Total (shops):	
Selling price:	12,814	Sales:	230,700
Down-payment:	4,814	Down payments:	86,700
Annual instalment:	1,440	Annual instalments:	25,900
Repayment period: 8 years		Quite rent and assessment rates per annum	4,000
Interest rate charged: 8.5%		First year of operation: 1971	

Scheme C (266 units)

Average per unit:		Total:	
Selling price:	7,097	Sales:	1,887,800
Down-payment:	1,805	Down-payments:	480,100
Annual instalment:	672	Annual instalments:	178,800
Repayment period: 12 years		Quit rent and assessment rates per annum:	29,000
Interest rate charged: 7.5%		First year of operation: 1970	

Scheme D (48 one-roomed and 128 two-roomed units)

Average annual rental per unit:		Total annual rental revenue:	64,600
1-roomed unit:	240	Average vacancy rate: 1%	
2-roomed unit:	420	First year of operation: 1972	

TABLE C.8. (continued)

Scheme E (160 two-roomed units and 160 three-roomed units)			
Average annual rental per unit		Total annual rental revenue:	156,200
2-roomed unit:	432	Average vacancy rate: 2%	
3-roomed unit:	564	First year of operation: 1971	
Scheme F (243 two-roomed units, 81 three-roomed units and 76 four-roomed units)			
Average annual rental per unit:		Total annual rental revenue:	235,600
2-roomed unit:	504	Average vacancy rate: 1%	
3-roomed unit:	660	First year of operation: 1972	
4-roomed unit:	816		

*Interest rate charged by P.K.N.S.: 7.5%. Some units were bought in bulk by Cargo Handling Corporation and Kelang Port Authority who rehoused some of their workers in the scheme and charged interest rates of 3% and 4% respectively.

evicted under the Emergency (Clearance of Squatters) Regulations, 1970. Rents are unilaterally set by the local authority – following guidelines from the Federal Government. For state-funded schemes similar limitations exists, but there appears to be greater flexibility in the eligibility criteria as compared to federally funded schemes. In the case of hire-purchase schemes for example, P.K.N.S. is able to adjust conditions of sale (notably the amount of down-payment, monthly instalment and repayment period) to the particular circumstances of individual applicants. Although these terms generally are more favourable for the prospective occupant than those obtainable in the open market (see section 4.1, main text), it also means that P.K.N.S. is able to discriminate against those applicants whom it regards as risky in view of their lifetime earning capacity. In practice this means that middle-aged applicants often face higher down-payments and/or shorter repayment periods combined with higher monthly instalments than younger ones would expect to encounter.

Data on rentals and sales referring to the housing schemes studied are provided in table C.8. However these data do not

properly reflect the willingness to pay since conditions of competitive buying do not apply. In view of the market restrictions referred to above and the non-inclusion of certain cost elements in the calculation of rents or purchase prices which are based on cost recovery, the amounts paid are likely to underestimate considerably the willingness to pay for the housing services provided. So other means must be resorted to in order to estimate this, in which actual amounts paid can serve as a lower limit. It has been attempted below to estimate prices consumers would have been willing to pay for the housing services provided if these services had been made available in a competitive housing market. This has been done by collecting informed opinions on the subject from officers involved in administering the housing schemes (for rental schemes only) and from the tenants and owner-occupants. (see UNIDO, 1972, pp. 44). In addition, some prices pertaining to illegal letting or sub-letting of units, which takes place occasionally, have been obtained and these provided some help, although the element of illegality narrows the market and probably adds an additional 'risk premium' to the rental price asked, limiting the usefulness of these prices for assessment of possible prices in a hypothetical competitive market.[7]

Insofar as informed opinions have been collected from P.K.N.S. and Kuala Lumpur municipal officials, enquiries regarding the hypothetical rental value of the housing units in a competitive market could be made quite straight-forwardly. However it was felt that asking such questions equally directly to the tenants or owner-occupants would produce downward biased results, since it could be expected that tenants would state an amount lower than the actual amounts paid hoping that this would help them to reduce rents. The topic was therefore approached somewhat indirectly. In the cases of rental schemes tenants were first asked whether they

7. This admittedly inaccurate approach has been chosen for lack of a better alternative, such as using rents for comparable units in the competitive market. This was not possible because housing units provided by the private sector are of a higher quality. Units comparable to the schemes studied are all publicly provided and face similar market restrictions. Moreover, locational differences compound this problem.

would be willing to buy the house they rented if it was offered to them by P.K.N.S. or K. L. Municipality. The vast majority of tenants were willing to buy, but, when asked about a reasonable selling price, the amounts quoted generally turned out to be lower than the costs of the housing units (except in the case of scheme *E*), the replies probably reflecting a bargaining element as expected.

Secondly, in all schemes occupants were asked if, once they owned the house, they felt they would be able to let it to somebody else, and if so how much money they would expect as monthly rent. The respondents were asked to think of the hypothetical situation in which they shifted to another house and P.K.N.S. or K.L. Municipality allowed them to let their present house to somebody else. Replies have been averaged for each project and computed as a ratio of actual rents or instalments paid. Where this applied, opinions of officials interviewed have been treated in the same way.

A summary of all estimates is provided in table C.9. There appear to be rather substantial differences between estimates for each project and also between estimates by tenants and officials. The first set of differences can be explained by differences in actual annual payments, locational and unit size differences, but with reference to the

TABLE C.9. Estimated willingness to pay for housing (1973).

Scheme	Estimated ratio of willingness to pay to actual annual rentals or instalments paid as indicated by:		Annual welfare benefits to the occupants at accounting prices (in M$)
	Tenants or owner-occupants	Officials from the relevant authorities	
A	1.55	n.a.	300,100
*B**	1.19	n.a.	251,400
C	1.63	n.a.	291,400
D	1.92	1.43	108,200
E	1.12	1.56	209,300
F	1.17	1.42	305,100

*data on illegal subletting (with tacit approval from P.K.N.S.) provide the following ratios: housing units: 1.30, shops: 1.00.

second, it is quite difficult to say who would have a better insight to the hypothetical market considered: the officials or the tenants. The A.R.'s for annual welfare benefits to the tenants in the rental schemes have been estimated by averaging the ratios obtained from both sources. For lack of any further information an unweighted average has been used. Finally, to arrive at the annual aggregate welfare benefits to the occupants at accounting prices, the A.R. for services rendered by the 18 shops units in scheme *B* has been assumed to be unity.

Estimation of occupants' welfare benefits at accounting prices has been described in considerable detail above because a number of arbitrary assumptions are involved and because national-economic profitability of the schemes may be quite sensitive to values of A.R.'s for these welfare benefits. Consequently these values are varied in the sensitivity analysis carried out (see appendix D, table 2) in addition to variations in national parameters.

C.2.3. 'Spill-over' effects of indirect welfare benefits (to the government and to third parties – 'externalities')

As noted in section 2.1, in principle a case could be made for including changes in land values of sites adjacent to cleared sites as well as changes in property (built-up or vacant land) prices in the vicinity of new housing schemes constructed. However in neither case could changes in values attributable to clearance and housing construction respectively be identified, so these aspects are not taken into account. However this by no means implies that such effects could not be important in a different environmental setting.[8]

The 'spill-over' effects discussed in the present section then are only those resulting from some of the indirect welfare benefits to the occupants noted in the previous section and discussed in appendix B.

C.2.3.1. Health

Related to changes in health environment and health status of the rehoused households are changes in the extent of utilization of the

8. See e.g. Rothenberg (1967), Bahl et al. (1973), Lind (1973) for some of the conceptual issues involved. Rothenberg (1967, pp. 183–187) and Nourse (1963) provide some (conflicting) empirical findings for Chicago and St. Louis respectively.

health care delivery system (see appendix B, section 2). As government health care is provided free of charge to the user (or at a small nominal fee) and it is common practice for employers in the formal sector to pay for private sector health care for their employees and their families, it is assumed here that any reduction in utilization of care with rehousing represents savings to either government (two-thirds of total) or employer (one-third of total). Such savings consequently are not included in the occupants' willingness to pay for housing. As indicated in appendix B, section 1, only in one case (scheme *E*) might it have been conceivable that decreased accessibility of care influenced the number of visits to care after rehousing.

Based on data concerning frequency of out-patient visits for households of test and control groups ranging from a minimum of two years prior to rehousing of the test group to two years after, the following results have been found:

—a clear overall decrease in average annual outpatient visits per person attributable to housing has been found only for schemes *D* (0.16) and *E* (0.20);
—no significant changes have been observed for schemes *B* and *F*. In the latter case a reduction in visits has been found for household heads (0.21), but this was off-set by an increase in visits by other household members;
—in the case of scheme *C*, average annual visit rates increased by 0.28 per person, which could not be explained (especially in view of the increased distance to care after rehousing), while insufficient data were available for scheme *A* to draw any conclusions.

The difficulty of obtaining data on days of in-patient treatment allowed conclusions concerning this aspect for two schemes only. For both schemes *C* and *D* average annual number of days of in-patient treatment per household member declined with rehousing. For scheme *D* this difference amounted to 0.22 days per household member, while for scheme *C* the difference was too small to be significant.

The observed physical changes in utilization of health care facilities summarized briefly above provide the basis for the assumptions on annual monetary savings in utilization attributable to rehousing as shown in table C.10. Additional assumptions are an average household size of 5.7 (see table 3.5) and costs per day of in-patient treatment of M$51, and per outpatient visit of M$10.20.[9] These cost figures are also assumed to reflect real scarcities adequately. Only for scheme *D* have the above findings on utilization rates been used without reservation. This on-the-spot rehousing scheme served measurement purposes best and yielded data for both in-patient treatment and outpatient treatment. For scheme *E* (which physically is comparable to scheme *D*) it has been assumed that 20% of differences in outpatient visits found is attributable to reduced accessibility of care. If, in addition, it is assumed that reduction in days of in-patient treatment is at the same level as for scheme *D*, this puts the per household savings on a par for these schemes. For scheme *F* no overall reduction has been found: consequently, no savings have been assumed. This applies also to scheme *C*, where incidentally, potential improvements in health environments were fewer than for the other schemes. For schemes

TABLE C.10. Annual savings in utilization of health care delivery services in M$ (1973 prices).

Scheme	Savings per household	Total scheme savings
A	50.00*	21,800*
B	50.00*	16,500*
C	—	—
D	73.30	12,800
E	73.30	23,500
F	—	—

*applies from 1975 onwards.

9. Based on 1973 performance data, University Hospital, University of Malaya, Kuala Lumpur. See: The Treasury, Malaysia (1974, p. 274).

A and *B* no savings in utilization of medical services are assumed until after improvements in sewerage and drainage system were completed (1974, see sections 4.3.3.2, main text and 1.4 above). From 1975 onwards and arbitrary amount of M$50.00 annual savings per household is assumed.

C.2.3.2. Schooling

Changes in school performance have been measured with the aid of data on children of test and control households who were at school during a period from at least two years prior to rehousing of test groups until and including 1973 (refer also to appendix B, section 3). Due to small sample sizes for the individual schemes, significant results could only be obtained for an aggregated sample of test and control group children concerning all schemes combined, stratified for ethnic composition (see Wegelin, 1975, pp. 125–129 for further details). Performance indicators selected were absenteeism and test and examination results. Average absenteeism increased by 0.89 days per pupil annually, or by 13.2% over pre-rehousing performance, while overall test and examination results improved with rehousing by 2.8 percentage points per pupil, an increase over average pre-rehousing performance of 5.3%. These seemingly conflicting outcomes could perhaps be interpreted as a substantially increased effectiveness of school days actually attended (to the extent of 19.2%) caused by rehousing. However what is important in the present context is that this increased effectiveness has not led to any public savings – rather the rehoused households chalked up additional gains – educational performance of their children improved, while at the same time their children were available for domestic duties more often. This, as well as increased transport costs to school (where this applies, see table 4.5), has been assumed above to be already included in their willingness to pay for improved housing. Although presumably pre-rehousing test and examination results could have been achieved at 5.3% lower educational inputs after rehousing, this simply has not happened: consequently no savings of resources apply and no 'spill-over' effects related to educational benefits are taken into account. Increased expenditure

on school transport is borne by the households themselves and therefore is already internalized.

C.2.3.3. Productivity at work

The proxies used to measure productivity (appendix B, section 4) did not provide an overall physical yardstick of productivity: no data on changes in volume of output per worker caused by rehousing, combined with output prices per unit could be compiled. It was possible to obtain an impression of productivity gains accruing to employees with the aid of data on absenteeism, overtime hours worked, bonus and overtime payments, promotions etc. For lack of data on overall productivity increases, the gains accruing to employers could not be estimated. This is unfortunate because only those gains clearly represent an externality. Increased productivity benefits accruing to rehoused households are internalized and so are increased transport costs to work, unless they are paid for by the employer (this is not generally the case). Although this may be questionable in the case of increased workers' earnings resulting from higher productivity caused by rehousing it has been assumed above that all gains accruing to the rehoused households are already incorporated in their willingness to pay for housing and thus should not be taken into account again.

Returning to the productivity benefits accruing to the employers, these have been assumed to be nil for scheme *F*, in view of the large number of self-employed residing in that scheme. For those schemes where monetary gains to the rehoused workers (other than changes in basic salaries) attributable to rehousing have been found, it has been assumed that productivity benefits per rehoused worker accruing to employers have been equally large (in view of the prevailing labour market situation, this assumption is almost certainly on the conservative side). After correction for self-employed allowing for more than one income earner per household (1.2 on the average) the assumed productivity benefits accruing to employers have been calculated for each scheme and are provided in table C.11. For scheme D no significant net monetary benefits (overtime and bonus payments combined) accruing to workers have been

found, and it is assumed that employers did not reap any such benefits either.

C.2.3.4. Crime

The data on crime rates and value of stolen property discussed in appendix B, section 5, suggest that crime rates in multi-storey government low-cost housing estates (such as scheme *F*) are higher than in squatter areas, whereas the reverse is true for low-rise (three and four storeys) low-cost housing estates (such as schemes *D* and *E*). This applies to all three types of common crimes discussed (Table B.1). Average value of stolen property is highest for low-rise flats, lowest for squatter areas. This combined leads to the tentative conclusion that rehousing from squatter areas to low-cost flats (notably high-rise ones) is likely to bring an overall increase in expected average annual losses per resident household (table B.2).

A negative externality is involved in such rehousing to the extent that not only residents but also outsiders (visitors or residents of adjacent areas) suffer from this increased risk.[10] If it is crudely assumed that in the case of robberies and gang robberies, as well as for thefts and thefts in dwelling one half of the victims are non-residents (for all types of housing areas alike), then rehousing to low-rise

TABLE C.11. Assumed annual productivity benefits of rehousing accruing to employers in M$ (1973 prices).

Scheme	Amount per rehoused worker	Total amount for scheme
A	16	6,700
B	16	5,100
C	245	50,800
D	—	—
E	59	18,100
F	—	—

10. To a large extent only residents are likely to be affected. This is most clear in the case of housebreaking and theft. As for all other indirect benefits and costs discussed, it is assumed that insofar as residents are affected, they take this into account in their willingness to pay for housing.

flats would imply an increase in expected average annual losses to non-residents of M$1.15 per resident household. For high-rise flats this would be M$6.65. For schemes *D*, *E* and *F* this implies annual external costs of M$200, M$400 and M$2,600 respectively. For terrace housing schemes *A*, *B* and *C* no changes in this respect are assumed. Another 'spill-over' effect related to crimes may consist of the possibility that, if overall crime rates drop with rehousing, a saving on police surveillance could be possible. This has not been taken into account here for the following reasons:

—rehousing from squatter areas to low-cost housing schemes will not contribute much to an overall reduction in crime rates (the number of charged criminal offenders originating from squatter areas is already relatively low – table B.3).
—it is doubtful if surveillance would be affected much and even if it were, the monetary implications are likely to be quite small (compare e.g. the following section on firemen).

C.2.3.5. Fires

Data in table B.4, appendix B section 6, suggest substantial differences in number of fires, damage per fire and fire brigade efforts to extinguish fires when comparing squatter areas and low-cost housing estates. Differences in property losses are internalized by the residents except to the extent that fires spread to adjacent areas. This implies that by rehousing squatters, fire hazards to residents in adjoining areas are reduced, which constitutes a potential externality. The extent to which this happens is not known. The data indicate that rehousing would lead to an expected average annual reduction in property losses of M$2.94 per resident household. If again it is assumed that half of all damages concern non-resident properties, then the estimates of expected annual external benefits on this count are as follows for each scheme: *A*: M$600; *B*: M$500; *C*: M$400; *D*: M$300; *E*: M$500 and *F*: M$600.

The data in table B.4 also suggest that utilization of fire brigade services is significantly reduced with rehousing. However, the resulting saving is negligible in monetary terms (assuming a man-

hour cost per fireman of M$2.00 and an engine-hour cost of M$25.00).

C.2.3.6. Summary of 'spill-over' effects

A summary review of all estimates of net 'spill-over' benefits resulting from some social impacts of rehousing (as discussed in appendix B) is provided below for all schemes:

Scheme	Annual net 'spill-over' benefits in 1973 (M$).
A	7,300 (29,100)*
B	5,600 (22,100)*
C	51,200
D	12,900
E	41,700
F	−2,000

* From 1975 onwards.

What is apparent (apart from the negative net result for scheme *F*), is the relative insignificance of these 'spill-overs' as compared to annual occupants' welfare benefits (except for schemes *C* and *E*, where these net 'spill-over' benefits are approximately 20% of such benefits). This raises the well-known question of whether it is worth bothering to estimate such effects at all, in view of the often painstaking process of primary data collection necessary. In spite of the magnitude of the above results, it is felt that for the present study this question merits an affirmative answer, if only because the data collected have made it possible to provide some factual perspectives to a number of well-known myths concerning the social costs of slum and squatter housing, notably those related to crime.

C.3. REDISTRIBUTIONAL COSTS AND BENEFITS

C.3.1. Groups affected and target groups I to IV

Redistributional costs and benefits consist of net aggregate consumption costs and benefits incurred by or accruing to each target

group. Redistributional costs are calculated as the immediate aggregate consumption costs incurred by this group minus any compensating receipt from any other group; redistributional benefits as the immediate aggregate consumption benefits received by this group minus any compensating payment to other groups (compare section 4.3.2, main text and appendix A, section 5.3). Concerning the housing schemes studied several distinct groups can be identified which are affected directly by the schemes:

A. The government (which is here considered as a monolithic entity; in other words, it is immaterial to the study which government department, whether Federal or state, records gains or losses);
B. land and property owners (only where private land or property is affected).
C. suppliers of inputs (labour, entrepreneurs, suppliers of foreign exchange);
D. employers of household income-earners (through some of the spill-over effects discussed in the previous section); and
E. the rehoused households themselves.

As discussed in section 5.1 (main text), in the context of the NEP the Malaysian population can be divided into four target groups, being:

I. Poor Malays
II. Poor non-Malays
III. Non-poor Malays
IV. Non-poor non-Malays

Ethnic divisions are clear, but several definitions of the poverty-line household income or per capita household income have been used in the Malaysian context (see sections 2.4.3 and 3.4.2, main text). In section 5.1 (main text) the cut-off level of M$200 household income per month (1970 prices) has been adopted as the poverty-line household income.

Net transfers to each of the above target groups have been given premium (positive or negative) redistributional weights. So it must be established to what extent the affected groups A to E contain

members of each target group *I* to *IV* and how large net gains or losses to each affected groups are, after which net redistributional costs or benefits to all target groups can be determined. After multiplying these by their appropriate premium weights, net annual redistributional costs or benefits to all target groups can be added together to the net annual aggregate consumption costs or benefits.

A. The government: of the five affected categories, it is assumed here that the government is of no special interest and its net revenue does not warrant a premium weight. It does not contain members of target groups but it fulfils an intermediate role in allocating funds among various investment activities. In other words it is instrumental in distributing costs and benefits between the various segments of society, but is not itself considered a section of society whose net gains or losses are of special concern.[11] The extent of these gains or losses has, of course, implications for the financing of government activities.

B. Landowners (both of land utilised by the schemes and of cleared land): most land affected by the schemes is state land, except for some areas in Kelang and Port Kelang (schemes *A* and *B*). Ownership was non-Malay in these cases. Although no data are available on income levels of landowners, it seems plausible to assume that none of the urban landowners involved earned less than M$200 per month. This means that redistributional costs and benefits through the projects' impact on land applies solely to group *IV*. Redistributional costs applied when the government acquired land for schemes *A* and *B*, which was partly offset a few years later, when

11. This conforms to the position taken (rather implicitly) in the UNIDO guidelines. However a case could be made for a premium weight on net revenue to the government, depending on the premium weight of each target group and on the proportion of overall government expenditure actually benefitting those groups. This assumes that net government revenue caused by the project would be spent in accordance with its overall expenditure pattern. In practice it is of course quite difficult to determine the approximate proportion of government expenditure benefiting each target group.

the government eventually paid the landowners (see section 1.3).[12] Redistributional benefits to private landowners of cleared land only applied in case of scheme *A* (section 2.1), where land value increases caused by clearance accrued to the landowners concerned.

C. Suppliers of inputs (other than land): redistributional effects of the schemes through their impact on suppliers of inputs come about through differences between accounting prices and market prices of these inputs. This is most clear (and also quantitatively most important) in the case of non-salaried labour. Since market wages are higher than opportunity costs of unskilled, semi-skilled, and in some cases skilled labour, differences between wages paid and these opportunity costs represent an income redistribution to the workers concerned. Concerning traded goods one could argue that the government in initiating the schemes deprives other potential users of the foreign exchange necessary to acquire the traded goods used in the schemes. In view of the A.R. of 1.04 it does so at a price which is 4% below its opportunity costs. This implies that other potential users of foreign exchange will lose to that extent. Since this group cannot be readily identified, no information on its racial breakdown and income distribution are known. However in view of the small quantitative impact, these redistributional effects can be safely neglected. Differences related to indirect taxes provide no redistributional effects since gainers and losers are both governmental.

Net redistributional benefits to labour inputs consist of net benefits to skilled, semi-skilled and unskilled labour involved in construction of the housing schemes and net benefits to unskilled labour

12. For those schemes where government land acquisition has been imputed at values below estimated opportunity costs (see section 6.2.2, main text) redistributional costs to hypothetical landowners apply. These costs have not been allocated to any of the four target groups. Redistributional effects of changes in losses caused by thefts, robberies and fires, incurred by owners and occupants of adjacent properties and other non-residents will not be taken into account. The amounts involved are relatively small and it is virtually impossible even to guess in which target groups gainers and losers in these respects would be.

employed in day-to-day maintenance (strictly speaking, payments to labour involved in clearance, relocation and non-annual maintenance also have redistributional implications, but these are neglected in view of their limited quantitative impact).

How is skilled, semi-skilled and unskilled labour utilized in the schemes divided between redistributional target groups *I* to *IV*? Wages rates per day in the construction industry in 1973 were as follows:

skilled labour	M$10.00 to M$14.00
semi-skilled labour	M$7.50
unskilled labour (male)	M$6.50

Based on a month of 20–24 working days (for construction workers the number of workable days per month would depend – apart from Sundays and holidays – on weather conditions) and at an average number of workers of 1.2 per household, households of unskilled labourers earned less than M$200 per month (current 1973 prices). Households of semi-skilled labourers were border-line cases with income hovering closely around M$200, depending on the actual number of working days and number of workers per household. In the calculation of redistributional benefits, net benefits accruing to these households have been included, because in 1970 prices their incomes certainly are below M$200. Households of skilled workers clearly did not qualify, their monthly income being higher than M$200 given even the most favourable assumptions.[13] So households of unskilled and semiskilled labourers are either in group *I* (if Malay) or in group *II* (if non-Malay). Similarly households of skilled labour are either in group *III* or in group *IV*.

Data on the ethnic distribution of labour involved in construction of the housing schemes under study could not be obtained. Malays comprised 21.7% of the labour force in the construction industry in Peninsular Malaysia in 1970 (see Government of Malaysia, 1973, table 4.4, p. 77). For metropolitan Kuala Lumpur this has been

13. It is assumed that, if there is more than one worker per household, this worker earns a similar wage to the household head. In reality, this may well be more or less. On average, the second breadwinner will probably earn less than the first, but since no data on this are available, the above assumption had to be resorted to.

estimated at 6.8% in that year (Joint Universities team, 1974, p. 12), and for metropolitan urban Selangor at 8.2% (Narayarar, 1976, appendix table 15, p. 328). This last figure is probably most relevant to the housing schemes studied, all contractors involved being Selangor-based and located either in greater Kuala Lumpur or in Kelang. So it is assumed here that this percentage applies to the labour force involved in constructing the schemes, and equally so at all levels of skills.

Wages of unskilled labourers employed in day-to-day maintenance (assumed to be all Malays) were considerably below M$200 per month in 1973. At an estimated 1.2 workers per household, monthly household incomes were still below that level and most certainly below M$200 in 1970 prices; consequently these households are all considered to be in group *I*.

D. Employers: as Malay ownership, both in corporate and non-corporate sectors of urban economic activities (notably in trade and construction, where it was negligible) was small in 1972/73 (see Government of Malaysia, 1976, table 9.8, p. 183), it is assumed here, that all employers involved could be classified in target group *IV*, non-poor, non-Malays. A similar assumption is made concerning earners of profits made in construction of the schemes.

E. Rehoused households: annual net redistributional benefits or costs to the rehoused households consist of aggregate consumption benefits or costs accruing to or incurred by them minus any compensating payments made by or to them. Redistributional impacts of major importance apply to the extent that households' willingness to pay for their new housing deviates from the payments made for housing by the households concerned. On balance this constitutes a large net redistributional benefit to the households, except in the first year of occupancy for the hire-purchase schemes, when the sum total of down-payment, annual instalment, quit rent and assessment rates exceeds the willingness to pay (as calculated on an annual basis). Consequently in the initial year of operation a net distributional cost applies to the households rehoused in the hire-purchase schemes. In the later years they reap net benefits, especial-

ly after housing loans have been repaid in full (table C.12). For the rental schemes redistributional benefits to the rehoused households apply throughout the operational period of the scheme, consisting of the difference between the willingness to pay and actual rentals paid. These differences are largest in the initial years of operation as a result of the bridging rent-subsidies provided by the authorities (see sections 4.1, main text and 1.5 above).

In the year of relocation (initial year of operation) a second redistributional cost to the rehoused households applies: the loss of the demolished structures, at least to the extent that these were owned by the rehoused households themselves.[14] This loss implied an aggregate consumption cost to them (see section 1.5) for which no compensation was given.

The extent to which these redistributional benefits and costs apply to each of the target groups distinguished obviously depends on the ethnic composition and income distribution of the rehoused households in each of the schemes. Table C.13 provides some data on these aspects. Data have been taken from the housing application forms, which were all filled out at a time when the general price level was approximately equal to that in 1970 (see section 2.4.2, main text, and table 2.10). In addition to the poverty-line household income, the eligibility cut-off household income has also been included as a benchmark. The table shows that especially schemes *A*, *D* and *E* are likely to have substantial beneficiary redistributional effects (in view of the α's estimated in table 5.4) as a result of redistribution to rehoused households. The percentage of households above the income eligibility level is particularly low for schemes *A* and *D*. In any case, the often-heard contention that much low-income housing does not reach the groups for which it is intended does not apply to the schemes studied (although admittedly changes in distribution are likely to take place over time).

14. The following percentages of owner-occupiers have been recorded for the rehoused households prior to rehousing (compare table 3.4):

scheme A: 6%	scheme D: 64%
scheme B: 61%	scheme E: 51%
scheme C: 37%	scheme F: 21%

The redistributional impact of demolition losses to squatter landlords has not been explored.

TABLE C.12. Net annual redistributional benefits to rehoused household in M$ (1973 prices).

	First year of operation						
Scheme	Demolition	Welfare benefits less compensating payments	Total	Second year	Third year	After repayment of housing loans	Repayment period
A	−162	−1,278	−1,440	592	592	2,528	16.4 years
B	−716	−3,290	−4,015	−37	−37	2,117 (222)[a]	15 years (houses) 8 years (shops)
C	−384	−3,965	−4,349	836	836	2,624	12 years
D	−298	544	246	436	436	436	—
E	−904	1,507	603	1,312	531	531	—
F	−127	884	757	1,873	695	695	—

[a] After 8 years when loans for shops have been repaid, but not housing loans.

TABLE C.13. Percentage distribution of households according to ethnic group and household income in M$ (current prices).

Scheme (and year forms were filled out)	Ethnic group	Household income per month		
		<200	200–<300	300 and above
A (1967)[a]	Malay	32.4	12.2	3.0
	Non-Malay	29.9	21.3	1.2
B (196)[b]	Malay	16.5	31.1	12.7
	Non-Malay	11.6	23.9	4.2
C (1967)	Malay	6.9	31.2	12.9
	Non-Malay	6.9	28.2	13.9
D (1971)	Malay	61.3	30.0	8.7
	Non-Malay	—	—	—
E (1971)	Malay	46.9	26.2	8.1
	Non-Malay	7.1	5.5	6.2
F (1971)[c]	Malay	12.4	28.2	16.6
	Non-Malay	9.7	18.4	14.7

[a]No income data on 25% of households available; it is assumed that the income distribution among these households is similar to that of the other households.
[b]Ibid., 14%.
[c]No income data available on police and army personnel (all Malays). Income distribution is assumed to be similar to that for other Malays.

C.3.2. Net redistributional benefits to target groups

Table C.14. shows the NPV's of net redistributional benefits to each of the four groups for all schemes discounted at central SDR values of 7% and 10%. The table indicates that income redistributional implications are rather different for each scheme. The main single factor influencing this is the income and ethnic distribution of occupants of the schemes (table C.13), while concerning some individual schemes particular features apply. Scheme *A* and *E* tend to favour particularly groups *I* and *IV* (substantial redistribution to private landowners in case *A* and to employers in case *E*), scheme *B* has a mild bias towards the poor, whereas scheme *C* benefits especially the non-Malay, non-poor (partly caused by redistributional

TABLE C.14. Net present value of redistributional benefits in M$ (1973 prices).

Scheme							
To groups	At SDR	*A*	*B*	*C*	*D*	*E*	*F*
I	7%	938,000	530,000	359,100	355,000	559,200	239,800
	10%	579,700	326,000	225,300	227,900	420,300	158,400
II	7%	588,900	385,100	263,200	173,800	324,100	394,600
	10%	434,600	314,300	203,000	157,100	299,700	337,200
III	7%	202,200	290,300	635,700	173,800	311,900	367,200
	10%	109,200	88,900	318,300	110,600	236,000	240,900
IV	7%	944,300	295,800	1,233,200	83,000	484,200	344,500
	10%	709,000	117,900	731,500	63,100	355,700	249,900

benefits to employers). Scheme *D* particularly favours group *I*, whereas in the case of scheme *F* no strong bias to any group is discernible.

Adding NPV's of unweighed redistributional benefits to each group together to the NPV of potential cash-flows to the government (table 6.1, main text) should equal the NPV of net aggregate consumptions benefits NPV_E (since such unweighed additions imply that a dollar of net benefits to each group, including the government, is valued at unity). However since it has not been possible to trace all redistributional implications of cost and benefit items taken into account, a discrepancy remains when comparing data from tables 6.1 and C.14 to those in table 6.3. Unweighed NPV summation of redistributional benefits is larger than NPV_E, mainly because redistributional costs to squatter landlords (demolition losses), redistributional costs resulting from the use of an A.R. for foreign exchange in excess of unity and redistributional costs as a result of imputed government land acquisition below opportunity costs have not been allocated to any of the four groups in particular.

Appendix D. Tabulated results of sensitivity analysis

Relevant value ranges of all national parameters and selected variables are shown in table D.1. In tables D.2 to D.5 results are provided of alternate and simultaneous variation in the values of these parameters/variables within these specified ranges. The tables show parameter/variable values at which NPV's $\leqq 0$.

The decision rule specified in section 6.2.5 (main text) implies:

rejection if: $NPV_E(7\%)$ or $NPV_N(7\%) < 0$;
acceptance if: $NPV_E(7\%) \geqq 0$ and $NPV_N(10\%) \geqq 0$;
marginality if: $NPV_E(7\%) \geqq 0$, $NPV_N(7\%) \geqq 0$,
but $NPV_N(10\%) < 0$.

TABLE D.1. Value ranges of parameters and variables used in sensitivity analysis

Parameter/variable	Minimum	Maximum
AR_{SL}	0.80	1.20
AR_{SKL}	0.40	1.00
AR_{UL}	0.00	0.60
AR_P	0.70	1.10
AR_{TG}	1.00	1.10
AR_{IT}	0.20	0.30
SDR	IRR is estimated	
WPH	80% of central value	120% of central value
AMC	80% of central value	120% of central value
LC	80% of central value	120% of central value
e	0.5	1.5
k	0.5	1.5

TABLE D.2. Values of national parameters and variables (alternate variation within ranges specified in table D.1) at which NPV's ≦ 0.

NPV's for each scheme	AR_{SL}	AR_{SKL}	AR_{UL}	AR_P	AR_{TG}	AR_{IT}	WPH in % of central value	AMC in % of central value	LC in % of central value	e	k
A. $NPV_E(7\%)$	–	–	–	–	–	–	–	–	–		No change
$NPV_N(7\%)$	–	–	–	–	–	–	–	–	–	–	–
$NPV_E(10\%)$	–	–	–	–	–	–	–	–	–		No change
$NPV_N(10\%)$	–	–	–	–	–	–	–	–	–	–	–
B. $NPV_E(7\%)$	–	–	–	–	–	–	≦ 82	–	–		No change
$NPV_N(7\%)$	–	–	–	–	–	–	–	–	–	–	–
$NPV_E(10\%)$	All values	All values	All values	All values	All values	All values	≦114	All values	All values		No change
$NPV_N(10\%)$	–	–	≧0.225	–	–	–	≦ 89	–	–	–	–
C. $NPV_E(7\%)$	–	–	–	–	–	–	–	–	–		No change
$NPV_N(7\%)$	–	–	–	–	–	–	–	–	–	–	–
$NPV_E(10\%)$	–	–	–	–	–	–	–	–	–		No change
$NPV_N(10\%)$	–	–	–	–	–	–	–	–	–	–	–

D. $NPV_E(7\%)$	–	–	–	–	–	–	–	–	–		No change
$NPV_N(7\%)$	–	–	–	–	–	–	–	–	–	–	–
$NPV_E(10\%)$	–	–	≧0.525	–	–	–	≦ 83	–	–		No change
$NPV_N(10\%)$	–	–	–	–	–	–	–	–	–	–	–
E. $NPV_E(7\%)$	–	–	–	–	–	–	–	–	–		No change
$NPV_N(7\%)$	–	–	–	–	–	–	–	–	–	–	–
$NPV_E(10\%)$	–	–	–	–	–	–	–	–	–		No change
$NPV_N(10\%)$	–	–	–	–	–	–	–	–	–	–	–
F. $NPV_E(7\%)$	–	–	–	–	–	–	≦ 84	–	–		No change
$NPV_N(7\%)$	–	–	–	–	–	–	–	–	–	–	–
$NPV_E(10\%)$	All values	All values	All values	All values	All values	All values	≦119	All values	All values		No change
$NPV_N(10\%)$	All values	All values	All values	≧0.75	All values	All values	≦104	All values	All values	≦0.75	All values

*Where no value is indicated, NPV > 0 at all values of the variable concerned.

TABLE D.3. Accounting ratio values (simultaneous variation within specified ranges) at which NPV's ≤ 0.*

NPV's for each scheme	AR_{SL}	AR_{SKL}	AR_{UL}	AR_P	AR_{TG}	AR_{IT}
A. $NPV_E(7\%)$	–	–	–	–	–	–
$NPV_N(7\%)$	–	–	–	–	–	–
$NPV_E(10\%)$	≥1.17	≥0.955	≥0.555	≥1.07	≥1.0925	≥0.2925
$NPV_N(10\%)$	–	–	–	–	–	–
B. $NPV_E(7\%)$	≥1.12	≥0.88	≥0.48	≥1.02	≥1.08	≥0.28
$NPV_N(7\%)$	–	–	–	–	–	–
$NPV_E(10\%)$	≥0.84	≥0.46	≥0.06	≥0.74	≥1.01	≥0.21
$NPV_N(10\%)$	≥0.98	≥0.67	≥0.27	≥0.88	≥1.045	≥0.245
C. $NPV_E(7\%)$	–	–	–	–	–	–
$NPV_N(7\%)$	–	–	–	–	–	–
$NPV_E(10\%)$	–	–	–	–	–	–
$NPV_N(10\%)$	–	–	–	–	–	–
D. $NPV_E(7\%)$	–	–	–	–	–	–
$NPV_N(7\%)$	–	–	–	–	–	–
$NPV_E(10\%)$	≥1.07	≥0.805	≥0.405	≥0.97	≥1.0675	≥0.2675
$NPV_N(10\%)$	–	–	–	–	–	–
E. $NPV_E(7\%)$	–	–	–	–	–	–
$NPV_N(7\%)$	–	–	–	–	–	–
$NPV_E(10\%)$	–	–	–	–	–	–
$NPV_N(10\%)$	–	–	–	–	–	–
F. $NPV_E(7\%)$	≥1.15	≥0.925	≥0.525	≥1.05	≥1.0875	≥0.2875
$NPV_N(7\%)$	–	–	–	–	–	–
$NPV_E(10\%)$	≥0.80	≥0.40	≥0.00	≥0.70	≥1.00	≥0.20
$NPV_N(10\%)$	≥0.88	≥0.52	≥0.12	≥0.78	≥1.02	≥0.22

*Where no value is indicated, NPV > 0 at all values of A.R.'s.

TABLE D.4. Values of selected accounting ratios and variables (simultaneous variation within specified ranges) at which NPV's ≤ 0.*

NPV's for each scheme	AR_{SKL}	AR_{UL}	AR_P	AR_{TG}	AR_{IT}	AMC in % of central value	LC in % of central value
A. $NPV_E(7\%)$	–	–	–	–	–	–	–
$NPV_N(7\%)$	–	–	–	–	–	–	–
$NPV_E(10\%)$	≥0.94	≥0.54	≥1.06	≥1.09	≥0.29	≥116	≥116
$NPV_N(10\%)$	–	–	–	–	–	–	–
B. $NPV_E(7\%)$	≥0.88	≥0.48	≥1.02	≥1.08	≥0.28	≥112	≥112
$NPV_N(7\%)$	–	–	–	–	–	–	–
$NPV_E(10\%)$	≥0.46	≥0.06	≥0.74	≥1.01	≥0.21	≥ 84	≥ 84
$NPV_N(10\%)$	≥0.655	≥0.255	≥0.870	≥1.0425	≥0.2425	≥ 97	≥ 97
C. $NPV_E(7\%)$	–	–	–	–	–	–	–
$NPV_N(7\%)$	–	–	–	–	–	–	–
$NPV_E(10\%)$	–	–	–	–	–	–	–
$NPV_N(10\%)$	–	–	–	–	–	–	–

TABLE D.4. (continued)

NPV's for each scheme	AR_{SKL}	AR_{UL}	AR_P	AR_{TG}	AR_{IT}	AMC in % of central value	LC in % of central value
D. $NPV_E(7\%)$	–	–	–	–	–	–	–
$NPV_N(7\%)$	–	–	–	–	–	–	–
$NPV_E(10\%)$	≥0.79	≥0.39	≥0.96	≥1.065	≥0.265	≥106	≥106
$NPV_N(10\%)$	–	–	–	–	–	–	–
E. $NPV_E(7\%)$	–	–	–	–	–	–	–
$NPV_N(7\%)$	–	–	–	–	–	–	–
$NPV_E(10\%)$	–	–	–	–	–	–	–
$NPV_N(10\%)$	–	–	–	–	–	–	–
F. $NPV_E(7\%)$	≥0.91	≥0.51	≥1.04	≥1.085	≥0.285	≥114	≥114
$NPV_N(7\%)$	–	–	–	–	–	–	–
$NPV_E(10\%)$	≥0.415	≥0.015	≥0.71	≥1.0025	≥0.2025	≥ 81	≥ 81
$NPV_N(10\%)$	≥0.505	≥0.105	≥0.77	≥1.0175	≥0.2175	≥ 87	≥ 87

*Where no value is indicated, NPV > 0 at all values.

TABLE D.5. Values of selected parameters and variables (simultaneous variation of WPH and AMC; simultaneous variation of e and k, all within their specified ranges) at which NPV's ≤ 0.*

NPV's for each scheme	WPH in % of central value	AMC in % of central value	e	k
A. $NPV_E(7\%)$	–	–		No change
$NPV_N(7\%)$	–	–	–	–
$NPV_E(10\%)$	–	–		No change
$NPV_N(10\%)$	–	–	–	–
B. $NPV_E(7\%)$	$\leq$ 81	$\leq$ 81		No change
$NPV_N(7\%)$	–	–	–	–
$NPV_E(10\%)$	$\leq$115	$\leq$115		No change
$NPV_N(10\%)$	$\leq$ 90	$\leq$ 90	–	–
C. $NPV_E(7\%)$	–	–		No change
$NPV_N(7\%)$	–	–	–	–
$NPV_E(10\%)$	–	–		No change
$NPV_N(10\%)$	–	–	–	–
D. $NPV_E(7\%)$	–	–		No change
$NPV_N(7\%)$	–	–	–	–
$NPV_E(10\%)$	$\leq$ 81	$\leq$ 81		No change
$NPV_N(10\%)$	–	–	–	–
F. $NPV_E(7\%)$	–	–		No change
$NPV_N(7\%)$	–	–	–	–
$NPV_E(10\%)$	–	–		No change
$NPV_N(10\%)$	–	–	–	–
E. $NPV_E(7\%)$	$\leq$ 82	$\leq$ 82		No change
$NPV_N(7\%)$	–	–	–	–
$NPV_E(10\%)$	All values	All values		No change
$NPV_N(10\%)$	$\leq$106	$\leq$106	$\leq$0.85	$\leq$0.85

*Where no value is indicated, NPV > 0 at all values of the variable/parameter concerned.

Appendix E. Significance tests used

A. P test of significance.

If: c = probability of a certain event occurring in area A at any particular moment in time;
M = number of moments (period) considered;
N = average population of A during period M;
$\underline{x}$ = absolute number of events actually occurring in A during period M,

then $c \to 0$ and $NM \to \infty$ and it can be assumed that:

$$\underline{x} \cong \text{Poisson } (m), \text{ in which } m = \lim_{\substack{c \to 0 \\ NM \to \infty}} cNM \tag{1}$$

It follows that for areas A_1 and A_2:

$$\underline{x}_1 \cong P(m_1),\ m_1 = \lim_{\substack{c \to 0 \\ N_1 M \to \infty}} c_1 N_1 M \tag{1A}$$

$$\underline{x}_2 \cong P(m_2),\ m_2 = \lim_{\substack{c \to 0 \\ N_2 M \to \infty}} c_2 N_2 M \tag{1B}$$

$H_0: c_1 = c_2 = c$ $\qquad$ $H_1: c_1 \neq c_2$

Under H_0:

$$m = \lim_{\substack{c \to 0 \\ (N_1 + N_2)M \to \infty}} c(N_1 + N_2)M \text{ or, since } N = N_1 + N_2,$$

$$m = \lim_{\substack{c \to 0 \\ NM \to \infty}} cNM \tag{2}$$

and $$\frac{m_1}{N_1} = \frac{m_2}{N_2} = \frac{m}{N}. \tag{3}$$

The maximum likelihood estimate of m,

$$\hat{m} = x_1 + x_2. \tag{4}$$

From (3): $$\hat{m}_1 = \frac{\hat{m}}{N} \cdot N_1 \tag{5A}$$

and $$\hat{m}_2 = \frac{\hat{m}}{N} \cdot N_2. \tag{5B}$$

Test for $\underset{\sim}{x}_1 \cong \mathrm{P}(m_1)$ and $\underset{\sim}{x}_2 \cong \mathrm{P}(m_2)$. Reject H_0 if one or both tests indicates it cannot be accepted. For any $\hat{m}_{1,2} > 10$, approximate by using $\underset{\sim}{x}_{1,2} \cong N(\mu, \sigma)$ in which $\mu = m_{1,2}$ and $\sigma = \sqrt{m_{1,2}}$ respectively.

B. T test of significance

If: $\underset{\sim}{x}_1 \cong N(\mu_1, \sigma_1^2)$, $\underset{\sim}{x}_2 \cong N(\mu_2, \sigma_2^2)$ and $\sigma_1^2 \neq \sigma_2^2$

then $$t = \frac{\overline{X}_1 - \overline{X}_2 - (\mu_1 - \mu_2)}{\sqrt{S_1^2/n_1 + S_2^2/n_2}} \cong t_\nu \text{ (approximately)}$$

with degrees of freedom:

$$\nu = \frac{(S_1^2/n_1 + S_2^2/n_2)^2}{\dfrac{(S_1^2/n_1)^2}{n_1 - 1} + \dfrac{(S_2^2/n_2)^2}{n_2 - 1}}$$

$\mathrm{H}_0 : \mu_1 = \mu_2 \; (\mu_1 - \mu_2 = 0)$ $\quad$ $\mathrm{H}_1 : \mu_1 \neq \mu_2$

Under H_0, t becomes: $\dfrac{\overline{X}_1 - \overline{X}_2}{\sqrt{S_1^2/n_1 + S_2^2/n_2}}$.

C. X^2 test of independence.

If f_{i1}^0 is the observed frequency of units in area $i (i = 1 \ldots n)$ having attribute A and f_{i2}^0 the observed frequency of units in this area not having A, the X^2 test of independence can be applied to test:

H_0: f_{i1} is independent of the characteristics of i.
Under H_0, expected frequences (f^e) can be calculated for each cell:

$$f^e_{ij} = \frac{\sum_{j=1,2} f^0_{ij} \cdot \sum_{i=1}^{n} f^0_{ij}}{\sum_{j=1,2} \sum_{i=1}^{n} f^0_{ij}} \text{ and the test statistic}$$

$$g(f) = \sum_{i=1}^{n} \sum_{j=1,2} \frac{(f^0_{ij} - f^e_{ij})^2}{f^e_{ij}} \cong \chi^2_{(n-1)} \text{ (approximately).}$$

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List of abbreviations

AR	–	accounting ratio
AMC	–	annual maintenance costs
BN	–	barisan nasional (national front)
CAMS	–	council for asian manpower studies
c.i.f.	–	costs, insurance, freight
DAP	–	democratic action party
DCF	–	discounted cash flow
EPF	–	employees' provident fund
EPU	–	economic planning unit
EPV	–	expected present value
FELDA	–	federal land development authority
f.o.b.	–	free on board
GRM	–	gerakan rak'yat Malaysia (Malaysian peoples' movement)
IBRD	–	international bank for reconstruction and development
ICOR	–	incremental capital-output ratio
ICU	–	implementation and co-ordination unit
IHPS	–	international housing productivity study
ILO	–	international labour organization
IRR	–	internal rate of return
ISEAS	–	institute for southeast asian studies
KL	–	Kuala Lumpur
LC	–	Imputed land costs
LPK	–	lembaga pelabohan Kelang (Port Klang authority)
MCA	–	Malaysian Chinese association
MCP	–	Malayan communist party
MIC	–	Malaysian Indian congress
MSSH	–	socio-economic sample survey of households, Malaysia
MTR	–	mid-term review
NAC	–	national action council
NDPC	–	national development planning committee
NEC	–	national economic council
NEP	–	new economic policy
NOC	–	national operations council
NPV	–	net present value
OECD	–	organization for economic cooperation and development
PAS	–	parti islam sa-tanah Melayu (Pan-Malayan Islamic party)
Pekemas	–	partai keadilan masyarakat (social justice party)
PES	–	post-enumeration survey

PKNS	–	perbadanan kemajuan negri Selangor (Selangor state development corporation)
PPP	–	peoples' progressive party
p.s.f.	–	per square foot
PSRM	–	partai socialis rak'yat Malaysia (Malaysian socialist peoples' party)
RIEOR	–	relative incremental employment to output ratio
SDR	–	social discount rate
SEDC	–	state economic development corporation
SER	–	shadow exchange rate
SMP	–	second Malaysia plan
SNAP	–	Sarawak national party
SOC	–	social opportunity costs
SUPP	–	Sarawak united peoples party
SWR	–	shadow wage rate
TMP	–	third Malaysia plan
UCLA	–	University of California, Los Angeles
UDA	–	urban development authority
UMNO	–	united Malays national organisation
UNIDO	–	united nations industrial development organization
WPH	–	willingness to pay for housing

List of symbols (in order of appearance)

MPS_L	=	marginal propensity to save out of labour income
MPM_L	=	marginal propensity to import out of labour income
MPT_L	=	marginal tax proportion of labour income
MPS_E	=	marginal propensity to save out of entrepreneurial income
MPM_E	=	marginal propensity to import out of entrepreneurial income
MPT_E	=	marginal tax proportion of entrepreneurial income
W_x	=	consumption distribution weight of consumption level x
e	=	utility parameter, absolute value of the elasticity of social marginal utility with respect to per capita consumption
U_{C_x}	=	social marginal utility of consumption at consumption level x
U_{C_m}	=	social marginal utility of consumption at the mean consumption level
W_y	=	inter-ethnic distributional weight
k	=	inter-ethnic utility parameter
s_p	=	population share
S_i	=	income share
$W_I(\alpha_I)$	=	utility (premium) consumption weight of poor Malays
$W_{II}(\alpha_{II})$	=	utility (premium) consumption weight of poor non-Malays
$W_{III}(\alpha_{III})$	=	utility (premium) consumption weight of non-poor Malays
$W_{IV}(\alpha_{IV})$	=	utility (premium) consumption weight of non-poor non-Malays
g_t	=	growth rate of per capita consumption over time
p	=	'pure' social rate of time preference
AR_{TG}	=	accounting ratio for traded goods
AR_{UL}	=	accounting ratio for unskilled labour
AR_{SKL}	=	accounting ratio for skilled labour
AR_{SL}	=	accounting ratio for salaried labour
AR_P	=	accounting ratio for profits
AR_{IT}	=	accounting ratio for indirect taxes
NPV_E	=	net present value of 'efficiency' returns
IRR_E	=	'efficiency' internal rate of return
NPV_N	=	net present value of national economic returns
IRR_N	=	national economic internal rate of return

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