INTEGRATING STRATEGIC ENVIRONMENTAL ASSESSMENT INTO MALAYSIAN LAND USE PLANNING

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Abstract

The thesis develops a framework and system for integrating Strategic Environmental Assessment [SEA] into Malaysian land use planning, for the purposes of achieving sustainable development. The emphasis is upon procedural and resource aspects of SEA rather than on methodologies.

The research includes review and analysis of international and Malaysian published literature, government documents, case study analyses, a postal questionnaire survey and interviews. The development of the proposals is based on the identification of philosophies, principles and links between three main concepts, namely sustainable development, land use planning and Strategic Environmental Assessment. Examples of approaches and experiences of SEA from the United Kingdom, United States of America, Canada and elsewhere are analysed and evaluated. These are assessed against Malaysian national planning and land use planning systems and frameworks, and current Malaysian practices in environmental impact assessment. An evaluation of the strengths and shortcomings of the Malaysian systems, procedures, processes and resources is used to justify and form the basis for the proposals.

The thesis describes the research framework and methodologies; the basic concepts of sustainable development, land use planning and SEA/EIA; and the Malaysian political, legislative, institutional and planning frameworks. The proposals include an idealised SEA framework within a proposed national integrated planning system for Malaysia; the functions of Malaysian SEA; a proposed structure plan process with SEA; an outline strategy for actions; and subjects for further research.

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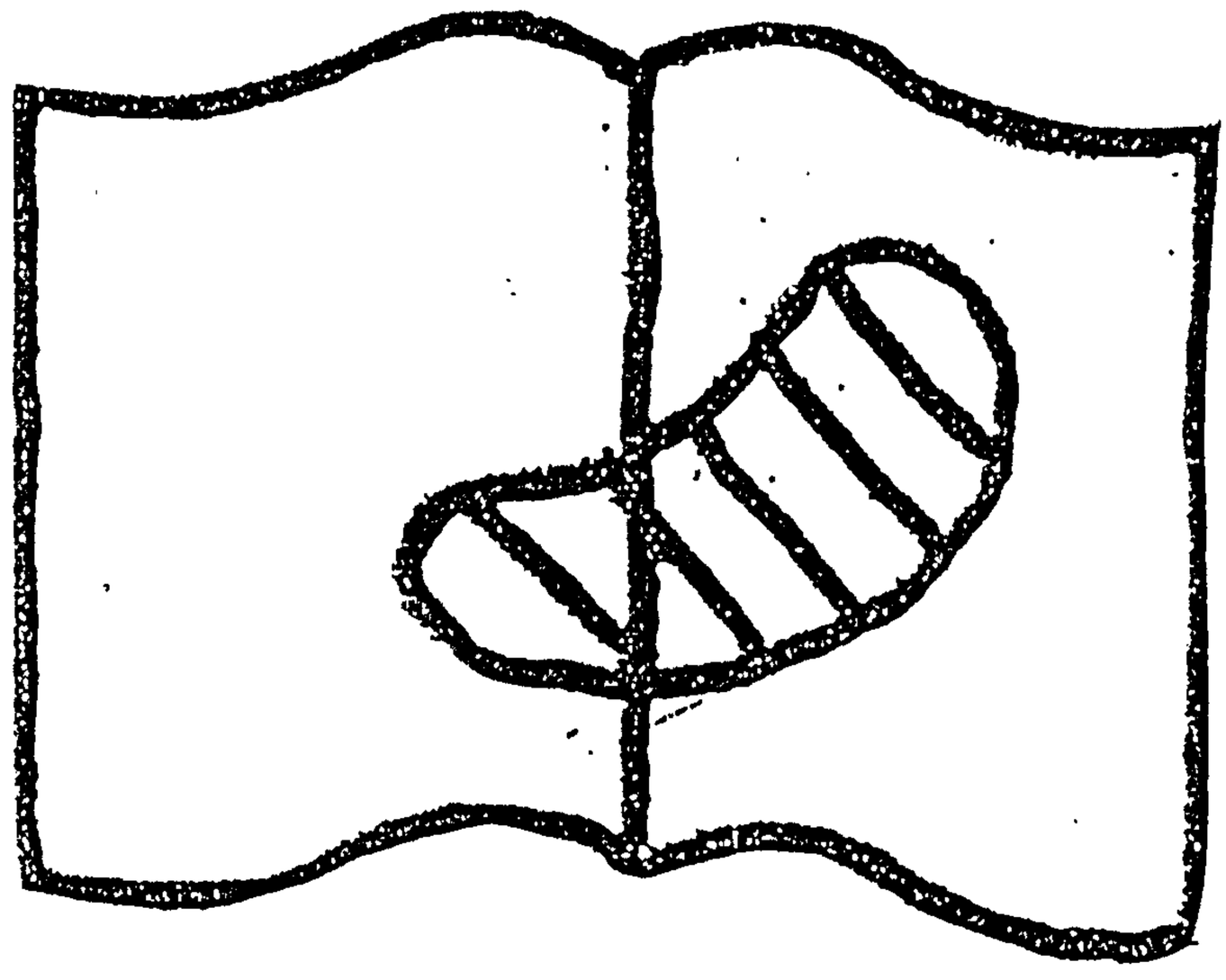

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"TERIMA KASIH" [THANK YOU]

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To my husband

Haji Abdul Majid bin Othman

with love and gratitude

He gave the inspiration and courage to take up the course

The encouragement, support and spirit to complete it

Integrating Strategic Environmental Assessment into Malaysian Land Use Planning

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Abbreviations

Act 171	Local Government Act 1976 of Malaysia
Act 172	Town and Country Planning Act 1976 of Malaysia
Areawide EIS	Areawide Environmental Impact Assessment
BLM	Bureau of Land Management of the USA
CEARC	Canadian Environmental Assessment Research Council
CEQ	Council for Environmental Quality [under NEPA of the USA]
CHOGM	Commonwealth Heads of Governments Meeting
CIA	Cumulative Impact Assessment
DoE	Department of the Environment
DSP	Draft Structure Plan
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EPM	Environmental Planning and Management
ESCAP	Economic and Social Commission for Asia and the Pacific
FLPMA	Federal Land Policy and Management Act of 1976 of the USA
FTCPD	Federal Town and Country Planning Department, Peninsular Malaysia
GIS	Geographical Information System
INTAN	[In Bahasa Malaysia] - National Institute of Public Administration
IUCN	International Union for the Conservation of Natural Resources
MAMPU	Malaysian Administration Modernisation Planning Unit
NEPA	National Environmental Policy Act 1969 of the USA
OPP2	Second Outline Perspective Plan [1991-2000] of Malaysia
PEIS	Programmatic Environmental Impact Statement
PPPs	Policies, Plans and Programmes
RMP	Resource Management Plan
ROS	Report of Survey
SEA	Strategic Environmental Assessment
SIA	Social Impact Analysis
SMP	Sixth Malaysia Plan [1991-1995] of Malaysia
SPC	State Planning Committee [under Act 172]
TCPD	Town and Country Planning Department of Malaysia
UET	Ultimate Environmental Threshold
UIA	Urban Impact Analysis
UK	United Kingdom
UNCED	United Nations Conference on Environment and Development
UNEP	United Nations Environment Programme
USA	United States of America
WCED	World Commission on Environment and Development
WCS	World Conservation Strategy
WWF	World Wild Life Fund

The Research Framework

Chapter 1 **INTRODUCTION**

Chapter 1

Introduction

1.1 THE RESEARCH SUBJECT

Strategic Environmental Assessment [SEA] is interpreted here as the application of Environmental Impact Assessment [EIA] at the level of policies, plans and programmes [generically known as PPPs]. Conceptually SEA is a *formalised, systematic and comprehensive process of assessing environmental impacts of PPPs and their alternatives*, leading to the production of a report of the findings of the assessment and evaluation exercise which is *used for publicly accountable decision-making* [Therivel *et. al.* 1992]. As defined, SEA is developed from EIA, but the concept is termed 'Strategic' because of the strategic nature of the PPPs which it assesses.

SEA is still relatively unknown and undeveloped even among EIA researchers and practitioners, although the philosophy and principle of EIA for PPPs was included in the National Environmental Policy Act [NEPA] 1969 of the United States of America [USA], which introduced EIA. Due to the complexity of applying EIA to PPPs, as a result of many uncertainties and complexities which are attached to the latter, EIA has been mainly focused on projects in the USA, and this practice has been adopted in other countries.

This research mainly focuses on SEA applied to land use planning. SEA in its varying terms and forms has been increasingly discussed in the literature since the early 1980s [apart from its inclusion in the NEPA of 1969 of the USA]. In 1981 the Department of Housing and Urban Development [HUD] of the USA produced comprehensive guidelines for EIA of metropolitan-size developments, i.e. for Areawide Environmental Impact Statement [Areawide EIS] [Therivel et. al. 1992]. Lee and Wood [1980] suggest several methods of EIA for use in physical [land use] planning. Jones [1983] identifies three approaches to how EIA can be applied to land use plans: parallel with the course of normal planning; within the planning process; and for the analysis of alternatives. Wood [1988a, 1988b, 1990] and Foster [1983, 1985] suggest that the best approach for EIA in plans is the integrated EIA approach or EIA in policy or plan-making approach. McDonic [1988] suggests two approaches for the use of EIA in development plans in the UK: inclusion of policies in structure/local/unitary development plans which require EIA for certain types of major developments; and indications of where EIA will be required in development control policy guidance notes and

the like, in structure/local/unitary development plans. De Jongh[1983] describes the experiment with EIA of land use plans in the South Brabant Industrial Park in the Netherlands, and Jones [1983] describes the example of a 2-stage EIA process for the supply of electrical power in the Eastern Ontario Study, in which the first stage is the plan-stage and the second stage is the project-stage, where the plan-stage EIA considers the 'do-nothing' alternative to the proposal, and alternative methods of carrying out the proposal.

The above literature can be termed the 'first generation' literature on SEA. The term 'SEA' was not used then, and suggestions for the extension of EIA was mainly for physical [land use] plans. The rationale and methods were simply extensions of project-level EIA to the planning level, particularly of land use plans. These suggestions did not gain much initiative in implementation nor research. It was not until the concept of the interdependence of development and environment was emphasised and publicised by *Our Common Future* [WCED 1987], and the implications this has on the formulation of PPPs, that the SEA concept gained major interest again.

The first well-known collection of articles on the application of EIA in land use planning is in Clark and Herington [eds.] [1988], and there is a relatively good coverage in Wathern [ed.] [1988]. However the articles were merely extensions of the previous discussions i.e. on the extension of project EIA to PPPs. Wood and Djeddour [1990] and Wood [1991] popularised the term SEA and highlighted the advantages of SEA over EIA, the differences between SEA and EIA, and their procedural/methodological differences. Lee and Walsh [1992] include sustainable development as a rationale for SEA. Other literature describes different approaches to assessments of environmental impacts and environmental appraisal, including Cumulative Impact Assessment [CIA] in CEARC and NRC [1986], Cocklin [1989] and Cocklin and Parker [1989 and 1990]; Programmatic Environmental Impact Assessment [PEIS] in Sigal and Webb [1989] and Webb and Sigal [1992]; Resource Management Plans [RMP] in Williams [1986, 1990] and the Bureau of Land Management [BLM] of the USA [1988]; Urban Impact Analysis [UIA] by Glickman [1980] and Breheny [1984]; and Ultimate Environmental Threshold [UET] by Kozlowski [1988, 1990].

Much research has been carried out by the Canadian Environmental Assessment Research Council [CEARC] on the shortcomings of project EIA and the need for a new approach towards more effective EIA for sustainable development. The results of CEARC researches are found in Krawetz *et. al.* [1987], Phaneuf [1990], Stokoe [1991], Bregha *et.al.* [1990] and Jacobs and Sadler [eds.] [1991]. Lee and Walsh [1992] also relate the new SEA approach to the sustainable development concept, but the most comprehensive review of literature on SEA is by Therivel *et. al.* [1992], which formally classifies the two approaches to SEA as [1] an improvement of the existing project level EIA, and [2] as a way of 'trickling down'

of the objective of sustainability. Linking the sustainablility concept to the precautionary principle, Therivel *et. al.* conclude that SEA may be the most direct way of making the sustainability concept operational. The literature identifies problems which are related to the real-life incremental approach to policy formulation, but it concludes that SEA provides the most comprehensive approach to move land use planning from the conventional development-centred approach to one which is people- and environment-led.

1.2 THE RESEARCH SIGNIFICANCE

This research is significant at two levels of concern: the global and the Malaysian.

1.2.1 Global concerns

The need for a combination of development and environmental conservation in order to achieve an improved quality of life has been acknowledged by international organisations and many national governments, mainly from the developed countries, since the 1970s. However the *World Conservation Strategy* [WCS] [IUCN, UNEP and WWF 1980], which first gave currency to the term 'sustainable development', emphasizes only three main objectives i.e. the maintenance of essential ecological processes and life-support systems, preservation of genetic diversity, and sustainable use of species or ecosystems. *Our Common Future* [WCED 1987] popularised the term sustainable development, and promoted the concept of global interdependence between development and environment. In the same year governments also adopted an Environmental Perspective to the Year 2000 and Beyond [United Nations General Resolution 42/186] to guide national actions and international cooperation for environmentally sound development.

Since *Our Common Future*, there has been much research and many publications on the interpretation of the sustainable development concept. By 1992, there were more than 85 definitions and perspectives [World Bank 1992, Hardoy et. al. 1992]. IUCN, UNEP and WWF [1991] published the successor to the WCS, i.e. *Caring for the Earth: A Strategy for Sustainable Living*, which outlines a checklist of 120 actions for sustainable development. Pearce *et. al.* [1989] in '*Blueprint for a Green Economy*' presented to the UK government a series of practical proposals for achieving sustainable environment. The 'Pearce Report' as it is popularly known, was followed by *Blueprint 2*' [1991] which extended the ideas of Blueprint 1 to international and global issues - global warming, ozone layer depletion, tropical forests, the population problem, etc. *Blueprint 3*' [1993], also by Pearce *et. al.*, gives ideas on how to measure sustainable development. Next to *Our Common Future*, the 'Blueprint' series by Pearce *et. al.* is quoted by many authors and has become the basis for many sustainable

development approaches and concepts [UK Government 1990, English Nature 1992, County Planning Officers' Society 1993, UK Government 1993].

Our Common Future also promoted the significance of linking sustainable development to land use planning, and the validity of advancing EIA as a tool for decision-making for PPPs. CEARC is most active in promoting EIA for sustainable development, while the EIA Centre at the University of Manchester in the UK is active in promoting the extension of EIA to PPPs in the form of SEA [Wood 1991, de Jongh 1991, Bass 1991]. Other works are as described in the earlier section.

The United Nations Conference on Environment and Development at Rio [UNCED 1992] endorsed the global concern for sustainable development. Of particular relevance to this research is *Agenda 21* [UNCED 1992] which includes programme actions which are of concern to land use planning, namely: the promotion of sustainable human settlement development [Agenda 21, Chapter 7] which specifies the promotion of land use planning, and the management and promotion of sustainable energy and transport systems in human settlements; the integration of environment and development in decision-making [Agenda 21, Chapter 8] which specifies the integration of environment and development at the policy, planning and management levels, specifically the adoption of comprehensive analytical procedures for the assessment of impacts of decisions on policies, programmes and projects [Agenda 21, Chapter 8 para 8.5(b)]; adoption of flexible and integrative planning approaches that allow the consideration of multiple goals [para 8.5(b)]; the development of systems for monitoring and evaluation by adopting indicators that measure changes across economic, social and environmental dimensions [para 8.6(c)]; the adoption of an integrated approach to planning and management of land resources [which include soils, minerals, water and biota that the land comprises] [Agenda 21, Chapter 10]; and the development of information systems for decision-making [Agenda 21, Chapter 40].

Following *Our Common Future* and *Agenda 21* many national governments have been developing concepts and guidelines on environmental consideration in PPPs and lately the inclusion of environmental appraisal in land use development plans. Prominent in this movement is the UK government which has produced several guidelines to improve environmental considerations in and latterly the environmental appraisal of development plans [DoE 1991, DoE 1992a, 1992b, DoE 1993]. Several recent attempts have been made at SEA of land use development plans, although the methods are termed 'broad brush', eg. Kent County Council [1993], Lancashire County Council [1993], and to a lesser extent Solihull Metropolitan Borough [1990].

Notwithstanding the above developments, there is no comprehensive literature which formally justifies the integral links between sustainable development, land use planning

and SEA in terms of their philosophies, concepts, principles and processes. The links have not been integrated into a formal model. Many land use planners are still sceptical of integrating SEA into land use planning, as opposed to strengthening 'environmental consideration' or 'environmental appraisal' in land use plans, as exemplified in the UK developments. Other than the identification of different forms of SEA within a tiered EIA structure [Foster 1983] and different types of SEA and EIA within a tiered planning and assessment system [Lee and Walsh 1992], there is no example of an SEA framework within a national planning system which integrates land use planning and socio-economic planning.

It is appreciated that there cannot be one SEA model which can fit all planning processes and planning systems. Each land use planning system, with its own socio-political-administrative framework of national planning, has to establish its own SEA process which takes into consideration national and local policies, government machinery, planning legislation, personnel and information availability. This research is a contribution to the development of an SEA system that fits within a land use planning system which is integrated within a national planning system for Malaysia.

1.2.2 Malaysian concerns

Like many developing countries, Malaysia has conflicting objectives of pursuing economic growth and preserving the environment [in 1990 the rate of poverty incidence was 17.1% for the whole of Malaysia and 15.0% for Peninsular Malaysia]. To turn Malaysia into a developed nation by the year 2020, the GNP is targeted to grow by 8 times. Nevertheless the government has joined the global concern for the environment and is also actively promoting sustainable development in the national and international scene, as exemplified by its initiative in the Langkawi Declaration on the Environment at the Commonwealth Head of Governments Meetin [CHOGM] in Kuala Lumpur [CHOGM 1989], and its 'vocal' presence in the Rio Earth Summit [UNCED 1992]. Malaysia's policy on 'growth with equity', 'attaining a balanced development' and 'prudent management of natural resources', are clearly spelt out in the Second Outline Perspective Plan [OPP2] 1991-2000 and the Sixth Malaysia Plan [SMP] 1991-1995.

There are efforts in Malaysia to recreate forests, and the Compensatory Forest Plantation Project is replanting degraded forests, but the annual felling rate of logs increased by 5.8% during the Fifth Malaysia Plan 1986-1990 to 41 million cubic metres in 1990, while land under agriculture increased from 4.9 million hectares in 1985 to 5.5 million hectares in 1990 [SMP 1991-1995]. The demand for resources to provide social and physical infrastructure for urban areas is expected to put more pressure on the environment as the

urban population is expected to grow from 40.7% of the total in 1990 to 60.0% in the year 2000 [OPP2 1991-2000].

The trend in the land use pattern of Johor State between 1966-1986 is an example of a cause for concern [FDTCP 1990a]. Within 20 years, agricultural land increased by 105% and urban land increased by 161%; while forests and scrubland decreased by 60%, and swamps decreased by 27%. While this land use trend is the result of urban and rural development which was necessary for the development of the country, future developments need to be more sensitive to this trend of depleting natural resources.

In practice, like many other developing countries, Malaysia is facing conflicts between economic growth and environmental deterioration. A good indicator is the increasing number of rivers which are polluted by Ammoniacal Nitrogen, which is an indicator of sewage and animal waste. Out of 53 rivers which are monitored by DoE Malaysia, the number of very polluted rivers with this pollutant has increased from 22 in 1990 to 25 in 1991. The number of slightly polluted rivers with this pollutant increased from 18 in 1990 to 19 in 1991, and the number of clean rivers decreased from 13 in 1990 to 9 in 1991. In general, in terms of pollution level of Ammoniacal Nitrogen [NH3-N] , there is a deterioration rate from 1.23% in 1990 to 1.95% in 1991. The level of suspended solids, which is an indicator of pollution from soil erosion, deteriorated from 0.69% in 1990 to 1.72% in 1991. Biochemical Oxygen Demand [BOD5] which is an indicator of organic pollution, however, improved from 0.21% in 1990 to 0.11% in 1991 [DoE Malaysia 1992]. These figures are signals for concern, as they represent results of urban and industrial development, modernisation in the agricultural sector, deforestation and devegetation.

Unlike the developed countries, there is very little published literature on the development of EIA, land use planning and sustainable development in Malaysia, indicating the lack of research and debate on these subjects. The most comprehensive literature which describes the history and development of town planning legislation in Malaysia is by Lee *et. al.* [1990] and the most critical literature on urban planning in Malaysia is by Goh [1991]. Documented reports on the subjects are also lacking in the public sector, indicating that there has been little development in promoting land use planning and EIA for sustainable development. The most relevant unpublished documents on the planning system are by Bruton [undated] and Azman [1984]. Other sources of information are in the form of government papers which are either classified as restricted, secret or uncollated and hence are mostly inaccessible. Although EIA was administratively introduced in 1984, and legally instituted in 1988, it is still considered 'new', and seminars, workshops and courses are still being conducted by the Institute of Public Administration [INTAN], with the help of the DoE Malaysia, to familiarise government officials and developers with the subject. The term

sustainable development is still not widely used, referred to or debated, even among government officials. Official stands on the concept are only interpreted from the two national policy documents: The Second Outline Perspective Plan 1991-2000 [OPP2 1991-2000] and the Sixth Malaysia Plan 1991-1995 [SMP 1991-1995].

Notwithstanding the inclusion of sustainability and sustainable development in the national plans, the machinery for achieving it is still not developed. The EIA system is still confined to projects [DoE Malaysia 1987, Ho 1990, Omar 1990, Bakar 1990]. Malaysia has still to have a comprehensive State of the Environment Report which could assist in providing sufficient information for assessing impacts of development on the environment. The most comprehensive official document is the Environmental Quality Report which is produced annually by DoE Malaysia.

The Malaysian land use development plan system, which was modelled on the English and Welsh system [1971 Planning Act], although instituted in 1976, is still relatively undeveloped in terms of procedural or substantive guidelines. To date there is no national or state guidance on environmental considerations or environmental appraisal, much less on the inclusion of sustainable development principles in development plans. The integration of EIA or SEA into land use planning has not been much discussed. In fact it is relatively unknown in planning circles, as discovered in this research.

With the global concern for the environment, the Malaysian national policy for growth with equity as well as for balanced development, land use planning has to play its role towards sustainable development. One approach is by integrating SEA in Malaysian land use planning, which is the subject of this research. However, being a new phenomenon in Malaysia, the logical first step is to examine and develop its institutional and procedural framework rather than substantive guidelines. These form the research framework, as described below.

1.3 AIM, OBJECTIVES AND SCOPE

The following sections outline the aim, objectives and scope of the research.

Aim and objectives of research

The research is intended to achieve the following aim and objectives:

AIM:

To develop a system for integrating SEA in Malaysian land use planning, and suggest related mechanisms, as one of the approaches towards achieving sustainable development.

OBJECTIVES:

To achieve the above aim, the research must achieve the following objectives:

1. To establish and justify the integral links between sustainable development, land use planning and SEA concepts, and between land use planning and socio-economic planning, within a national planning system;

2. To define the appropriate principles and operational version of sustainable development for national development planning in general, and for Malaysian land use planning in particular;
3. To define the existing Malaysian planning and EIA systems, and identify strengths and constraints which justify and form the framework for integrating SEA into the land use planning process;
4. To develop a Malaysian national planning framework which incorporates an SEA system;
5. To develop a land use planning system in which is integrated a hierarchical system of SEAs for land use plans;
6. To suggest a structure plan process which integrates SEA, as a model for other planning processes with SEA;
7. To identify opportunities and constraints in Malaysian institutional resources for putting into action the above developments and proposals; and
8. To suggest a strategy for actions and areas for further research which are necessary for instituting the above developments and proposals.

Scope of research

In line with the aim and objectives, this research concentrates on philosophies and principles of concepts, and the related political, institutional and procedural frameworks and approaches, rather than on scientific methods and techniques.

Three major concepts are analysed: sustainable development, land use planning and SEA [and EIA]. The identification and analyses of the philosophies, principles and processes of these concepts, as well as integral links between them, are used to justify and form the framework for the conceptual proposals. For example, when discussing sustainable development, the application of the concept of carrying capacity is identified and analysed, but not the techniques for measuring it. Similarly, the use of matrices, checklists and land suitability analysis are mentioned in the methodological guidelines for SEA for structure plans, but the actual techniques or parameters for operating them are not described. The same principle also applies in the examination of current planning and environmental impact assessment systems in Malaysia. Supporting technical information is only used for analysing

concepts and practices, and for defining opportunities and constraints which determine the criteria and assumptions for formulating proposals.

1.4 RESEARCH METHODOLOGY

This research into the integration of SEA into Malaysian land use planning adopts a rational methodology based on exploratory research which is problem-generating rather than testing of hypotheses. There is no explicit hypothesis testing because of the qualitative nature and limited scientific literature on this topic. A less formal approach, where stated propositions and objectives are used to put forward problems and generate ideas, was undertaken. However, to make the proposals effective, some underlying principles relating to sustainable development, were used as guiding principles throughout the research.

The research follows an approach and information gathering methods as described below:

1.4.1 The research process

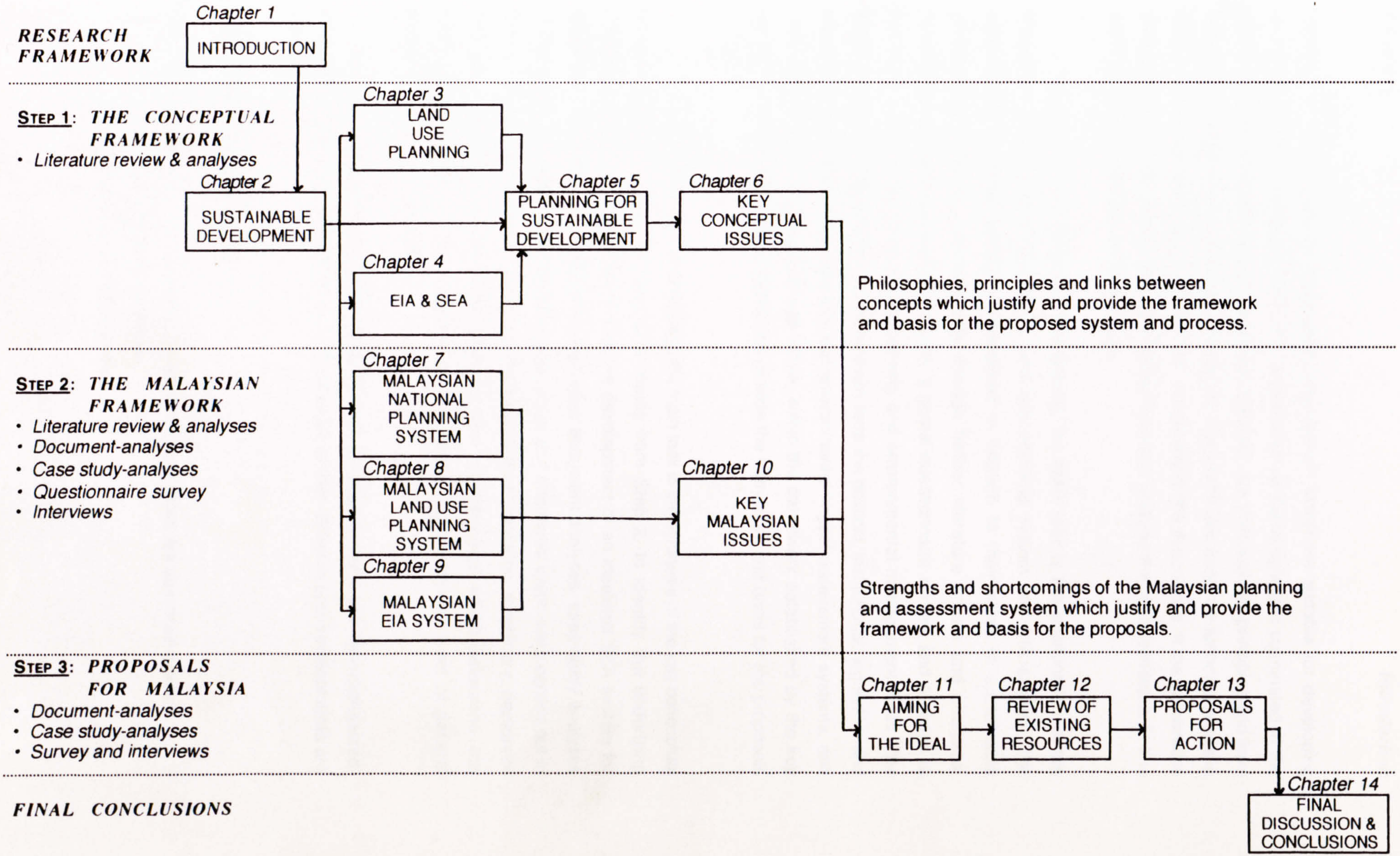
Given the aim and objectives, the research was undertaken following a 5-stage approach which contains 3 main steps. Fig. 1.1 illustrates the research methodology, by illustrating the subjects of examination and analyses in each step, and the flow and links within each step and between the steps. The steps in the research are:

Preliminary Step:	Establish THE RESEARCH FRAMEWORK
Step 1:	Establish THE CONCEPTUAL FRAMEWORK
Step 2:	Establish THE MALAYSIAN FRAMEWORK
Step 3:	Develop PROPOSALS FOR MALAYSIA
Final Step:	Make THE FINAL CONCLUSAIONS

The Preliminary Step established the terms of reference of the research, as contained in this chapter. This was established through a literature review of the main subjects of research - sustainable development, land use planning, EIA and SEA. The achievements and developments in these subjects in the international scene established the global significance of the research, while the situation in Malaysia identified the need for, and hence the significance of, the research for achieving sustainable development in Malaysia. The identification of aim and objectives determined the scope of the research and the detailed research methodology.

In Step 1 [The Conceptual Framework], the main task is further literature review and analyses of the concepts of sustainable development, land use planning, and EIA and SEA. The examination of several pieces of research in the ESCAP Region identified several

FIG. 1.1: RESEARCH METHODOLOGY FOR 'INTEGRATING STRATEGIC ENVIRONMENTAL ASSESSMENT [SEA] INTO MALAYSIAN LAND USE PLANNING'



approaches for planning for sustainable development which are suitable for developing countries, of which Malaysia is one. The examination of these concepts culminated in the identification of key conceptual issues which, basically, are philosophies, principles and links between concepts which justify and provide the framework and basis for further analysis in Step 2 and for the proposals in Step 3. Fig. 1.1 illustrates the importance of the sustainable development concept, which was used to examine and analyse the other concepts, in line with the aim and objectives of the research.

In Step 2 [The Malaysian Framework], the main task is the examination of the Malaysian national planning system, land use planning system and EIA system. The performance of these systems is analysed in relation to their roles in sustainable development. This task is performed through further literature review and analyses, document analyses, case-study analyses, a postal questionnaire survey, and a series of interviews with key personnel in the planning and environmental management fields. The analyses identified key Malaysian issues which form the political, institutional, legislative and procedural framework of the planning and environmental impact assessment systems, and identified strengths and shortcomings which, within the framework established by the key conceptual issues from Step 2, justify and provide the framework and basis for the proposals in Step 3.

In Step 3 [Proposals for Malaysia], the main task is the synthesis of the key conceptual issues from Step 1 and key Malaysian issues from Step 2, to identify the underlying philosophy, criteria and assumptions for the development of an idealised SEA system for Malaysia. This task was supplemented by further document analyses, case-study analyses and analyses of results of the questionnaire survey and interviews which were carried out in Step 2. The review of existing resources [policy, planning legislation, machinery, personnel and information] further identified strengths and shortcomings which determine the operational capability of the proposed system. Based on this review, a set of general proposals for actions is proposed.

In the final step [Final Conclusions], key conceptual links are re-emphasized, proposals are summarised, and a list of subjects for further research and developments are identified.

1.4.2 Research methods

This research is based on the following research methods which are described below:

- Literature review and analyses;
- Government document-analyses;

- Case-study analyses;
- A Postal questionnaire survey; and
- Interviews.

No one method can be identified to be for any one particular section or chapter in the thesis, as the information from each method is used and referred to throughout. They also supplement and validate each other for analytical purposes as well as for formulating criteria and assumptions.

Literature review and government document-analyses

Sections 1.1 and 1.2 describe the literature on developments in the sustainable development concept, land use planning, EIA and SEA. This method is in line with the approach which requires identification of philosophies and principles which justify and contribute to the development of proposals.

From Malaysia, most of the government documents are from the Federal Town and Country Planning Department [FTCPD] and the DoE Malaysia. These are in the form of annual reports, annual budgets, proposals for personnel upgrading, technical papers, conference and seminar papers, speeches, briefing notes and minutes of meetings. Some of the documents are cited in the reference list, but most are not, due to the informal references made to them by officials.

Case-study analyses

Although Malaysia as a whole is a case study by itself, this section refers to four Malaysian structure plans which have been studied in detail and are the source of reference to the nature of Malaysian structure plans, the level of environmental consideration, and the level of consideration of land use planning criteria for sustainable development, as particularly noted in Chapter 8 [Malaysian Land Use Planning System]. These four structure plans have been selected because they were prepared after the publication of *Our Common Future* and in the period when the preparation for the Rio Earth Summit was on-going. The four case studies are:

Muar District Structure Plan 1991-2010 [Muar Plan]
Petaling District Structure Plan 1991-2010 [Petaling Plan]
Bandar Melaka Structure Plan 1991-2010 [Melaka Plan]
Pulau Langkawi Structure Plan 1990-2005 [Langkawi Plan]

All four structure plans have been prepared for the same period i.e. 1991-2010 [Langkawi differs a little ; the plan period is 1990-2005]. They were prepared in the same period i.e. 1988-1992. However they have distinct characteristics [see Table 1.1] which reflect

differences in their objectives, strategies and policies for development, thus representing four types of planning areas.

Melaka and Langkawi are both tourist resorts, but while Melaka is a historical city rich in cultural heritage, Langkawi is a developing international resort well-known for its natural landscape and natural resources. The difference in the population sizes and the expected percentage of increases reflect the difference in the development strategies of the two areas. While Langkawi's density is already relatively lower than Melaka's, it is in reality much more rural in terms of physical characteristics [buildings and level of infrastructure].

While both Muar and Petaling Plans cover the whole of their respective districts, their population densities in 1990 and expected density in 2010 indicate a more urban development in Petaling, but a combination of urban and rural in Muar. The population density in Muar is in fact shown to be lower than that of Langkawi, due to the large extent of forest reserves and agricultural areas in the district. Petaling on the other hand is a metropolitan district, being located in the Klang Valley,which is the core development corridor in Malaysia, with Kuala Lumpur as its nucleus. The percentage increase in population from 1990 to 2010 indicates the high development strategy for Petaling, compared to the much lower development strategy for Muar.

TABLE 1.1: CHARACTERISTICS OF PLANNING AREAS IN THE MALAYSIAN STRUCTURE PLAN CASE STUDIES

Basic Characteristics	Muar Structure Plan	Petaling Structure Plan	Melaka Structure Plan	Langkawi Structure Plan
No. of local planning authorities	3	4	1	1
1990 Population ('000)	327	812	321	40
2010 Projected population ('000)	442	1,744	500	75
% of population increase	35	115	56	88
Total area (sq. Km.)	2346	546	301	48
Density in 1990 (persons/sq. Km.)	140	1488	1066	837
Density in 2010 (persons/sq. Km.)	188	3195	1661	1659

Postal questionnaire survey

An Information Availability Survey, in the form of a postal questionnaire, was conducted between 24 July 1992 and 31 October 1992. The 3-page questionnaire is attached as Appendix A. The survey was directed at government departments which are classified as agencies with environment-related activities, based on the basic list by the DoE Malaysia. The list was extended to add some state level agencies. The main objective of the survey was to

gather information for the review of existing resources in Part 3 of the research. The basic information, according to the question numbers in the questionnaire are:

A TYPES OF ENVIRONMENTAL DATA

1. Types of environmental data that are available in the department;

B PARTICIPATION IN EIA

2. Availability of personnel who are trained in EIA, and their qualifications;
3. Whether the department has a training programme for EIA, and if it has, the type of training programme;
4. Whether the department has participated in EIA projects, and if it has, information on the projects and the form of participation; and

C GENERAL

5. Aspects of departmental programmes and activities that are considered as relevant to EIA.

The questionnaires were sent in five batches: 24th July, 28th July, 29th July, 1st August and 4th August. The last returned questionnaire was received on 31st October 1992, at which time the level of response to the survey was as follows:

No. of questionnaires completed and returned	46	[56.8%]
No. of questionnaires completed over the phone	3	[03.7%]
COMPLETED QUESTIONNAIRES	49	[60.5%]
No. of questionnaires not completed despite phone calls	09	[11.1%]
Unable to contact responsible person by phone	23	[28.4%]
UNCOMPLETED QUESTIONNAIRES	32	[39.5%]
TOTAL SURVEY SAMPLE	81	[100.0%]

The identification of respondents and non-respondents are as listed in Appendix B. Although the response rate is only 60.5%, the result is good for postal questionnaires, and the type of information collected is only an indication of what is available in the departments; it should not to be taken as wholly representative information, since the departments are non-homogeneous. The list of respondents does include the critical departments which are normally actively involved in environmental planning and management, such as the DoE Malaysia, Forestry Department, Agriculture Department, National Energy Board, National Petroleum, Public Works, Drainage and Irrigation Department and the Veterinary Department.

Generally the survey indicates the level of participation of government departments in EIA and the degree of awareness and sense of responsibilities towards environmental planning and management. Many respondents indicate a willingness to participate in telephone interviews, thus showing keen interests in the subject. While many agree that EIA

is essential in planning and development, the general opinion is that the responsibility for this is with the DoE. As indicated in the questionnaire, questions were for open-ended qualitative answers. Therefore the answers will only be described and analysed in the appropriate sections in the thesis, particularly in Chapter 9 [Malaysian EIA System] and Chapter 12 [Review of Existing Resources]. The summary results of the survey are shown in Table 1.2.

Table 1.2 shows a relatively small number of respondents who provided details of environmental data, which was particularly required. Therefore this information was supplemented by information from reports and plans. The same approach was applied to the other information types.

TABLE 1.2: SUMMARY RESULTS OF THE INFORMATION AVAILABILITY SURVEY IN MALAYSIA [JULY - OCTOBER 1992]

Items according to the question numbers in the questionnaire	Number of Respondents		% of Respondents		% of total sample	
	Yes	No	Yes	No	Yes	No
A TYPE OF ENVIRONMENTAL DATA						
1. Provide details of environmental data	19	30	38.7	61.3	23.5	76.5
B PARTICIPATION IN EIA						
2. Indicate having EIA-trained personnel	14	35	28.6	71.4	17.3	82.7
3. Indicate having EIA training programme	8	41	16.3	83.7	9.9	90.1
4. Indicate having participated in EIA	29	20	59.2	40.8	35.8	64.2
C GENERAL						
5. Indicate having relevance to EIA	36	13	73.5	26.5	44.4	55.6

Interviews

The interviewees are a group of Malaysian land use planners and environmental experts who are regarded as competent personnel and a source of opinions which are backed by professional experience and dealings with political and institutional aspects of planning and environmental management. Twelve personnel were approached for semi-structured interviews, but only nine were finally interviewed. The nine interviewees were:

Director-General of the Federal Department of Town and Country Planning [FDTCP];

Deputy Director-General [Development Plans] of the FDTCP;

Director [Eastern Branch] of the FDTCP;

Structure Plan Project Manager of FDTCP [Central Branch];

Director of Selangor State Department of Town and Country Planning;

Director-General of the Department of Environment Malaysia;

Director [Assessment Section] of DoE Malaysia;

Land Use Planning/EIA Study Consultant from the Private Sector; and

EIA Consultant from the Private Sector.

This series of interviews was conducted between 24th August - 9th October 1992. While six of the interviews were completed in single sessions which ranged between 1-3 hours, three were completed over two or three sessions.

From personal experience in the Malaysian land use planning field, the lack of knowledge of SEA in Malaysia was already known before the beginning of this research. Therefore to achieve more effective interviews, interviewees were each given a copy of a 14-page paper titled '*Malaysian Plan EIA - Summary of Initial Proposals'* two weeks before the interview sessions. The paper contained some initial proposals for Malaysia, based on the initial review of developments in land use planning and EIA in the international scene, which were rationally applied to the Malaysian scene, within the context of the Malaysian social, economic, political and administrative environment, and in conformity with the Malaysian land use planning system. The interviews were to gather opinions on the concepts and proposals, and to get feedback on constraints which could deter the effectiveness of the proposals. Therefore the interviews were used for the assessment and validation of initial proposals as well as for the development of more detailed proposals. Generally the interviews centred on the following issues:

- The proposed national integrated planning system;
- The roles and responsibilities for SEA in Malaysia;
- The proposed integration of SEA into Malaysian land use planning;
- The capability of the Town and Country Planning Department as the responsible agency for SEA for land use plans; and
- Suggestions and opinions on the process, method and implementation of SEA in Malaysia.

Although small in number, the interviews can be considered as successful. The feedback has in many ways validated, and helped to strengthen and improve, the initial proposals and procedure for SEA for Malaysia. The feedback on opportunities and constraints in the land use planning field contributed towards the development of the detailed proposals as well as the outline strategy for actions. The results of the interviews are mainly used for Part 2 [The Malaysian Framework] and Part 3 [Proposals for Malaysia] of the thesis.

1.5 STRUCTURE OF THESIS

Fig. 1.1 illustrates the structure of the thesis which is integrated with the research methodology. Chapter 1 [Introduction] contains the research framework and sets the structure for the other parts of the thesis. The main content of the thesis is divided into three parts which are consistent with the three steps in the research methodology.

Part 1 [The Conceptual Framework] contains the results of tasks which were taken in Step 1 of the research. The examination of sustainable development, land use planning and EIA and SEA and their roles in sustainable development, are described in Chapter 2 [Sustainable Development], Chapter 3 [Land Use Planning] and Chapter 4 [EIA and SEA] respectively. Chapter 5 [Planning for Sustainable Development] reviews several planning approaches in developing countries, mainly in the ESCAP Region, which are most relevant for the Malaysian scene. The results of the examination and analyses of the three concepts are synthesized in the form of key conceptual issues, which are outlined in Chapter 6 [Key Conceptual Issues]. Throughout Part 1, the five chapters identify philosophies, principles and links between concepts which justify and provide the framework and basis for the proposed system and process.

Part 2 [The Malaysian Framework] contains results of tasks from Step 2 of the research. The results of the analyses and examination of the Malaysian National Planning System, Malaysian Land Use Planning System, and Malaysian EIA and SEA are described in Chapters 7, 8 and 9 respectively. These results are synthesized into key Malaysian issues which are the subject of Chapter 10. Throughout Part 2, the four chapters identify strengths and shortcomings of the Malaysian planning and environmental impact assessment framework which justify and provide the framework and basis for the proposals.

Part 3 [Proposals for Malaysia] describes the proposals that were formulated in Step 3 of the research. The proposed ideal SEA system is described in Chapter 11 [Aiming for the Ideal]. Chapter 12 [Review of Existing Resources] identifies strengths and shortcomings of the Malaysian resources in the context of policy, planning legislation, machinery, personnel and information. Against these, the Proposals for Action are outlined in Chapter 13.

The final chapter, Chapter 14 [Final Discussion and Conclusions] sums up the discussions on the various concepts, the proposals for Malaysia and suggests further research and developments for effective integration of SEA in Malaysian land use planning and in Malaysian national planning in general.

Part 1

The Conceptual Framework

Introduction to Part 1

The proposal to integrate Strategic Environmental Assessment [SEA] into land use planning is relatively new, and it is common to meet with opposition, mainly from land use planners. The main argument put forward against the proposal is that land use planning as a discipline is already capable of managing environmental change, and hence management of resources. The multi-objective, multi-dimensional and multi-disciplinary characteristics of land use planning also means that it is more than mere physical planning, but takes into consideration political, social, economic and physical environments, and their interactions. In general, land use planning principles as they are, if properly executed, can play an effective role towards sustainable development.

This part serves to justify the concept of integrating SEA into land use planning, and provide the framework and key issues to guide the analysis and evaluation of any country that is adopting the concept, as well as criteria for formulating and proposing appropriate systems, processes and guidelines for its implementation.

With the above aim, The Conceptual Framework examines concepts and principles of sustainable development in Chapter 2 [Sustainable Development]; principles and potential of land use planning in planning for sustainable development in Chapter 3 [Land Use Planning]; the rationale for developing SEA from EIA and its principles for integration within land use planning in Chapter 4 [EIA and SEA]; planning approaches and conceptual frameworks for integrating SEA into planning systems in Chapter 5 [Planning for Sustainable Development]; and key conceptual issues for integrating SEA into national and land use planning systems and processes in Chapter 6 [Key Conceptual Issues]. The findings and conclusions in this part form the basis for Part 2 [The Malaysian Framework] and Part 3 [Proposals for Malaysia].

Chapter 2

Sustainable development

2.1 INTRODUCTION

The term sustainable development has been popularised by *Our Common Future* [WCED 1987], although the interrelationship between development and environment, which is the tenet of sustainable development, has been debated world-wide since the early 1970s, and the term was officially acknowledged in the World Conservation Strategy in 1980. Since then, and until the World Summit on Development and Environment in Rio in 1992, there have been many definitions, interpretations and approaches to sustainable development, for developed as well as underdeveloped and developing countries.

Section 2.2 examines some global problems which provide the cause for environmental concern, and highlight the need for environmental management for sustainable development. Although the responsibility for environmental problems are global, the problems outlined here are mainly relevant to developing countries, where sustainable development is mainly focussed internationally. Then section 2.3 examines the sustainable development concept, by tracing its development from 1972 to 1992, and the implications on the present, in section 2.3.1. The examination of several definitions and thrusts of sustainable development in section 2.3.2 provides the basis for identifying several approaches which could be considered for adoption.

Section 2.3.3 examines the underlying principles of sustainable development, which form the framework for identifying several operational perspectives for implementation in section 2.3.4. These principles and perspectives are put together into institutional management perspectives in section 2.4, and into a planning and decision-making framework in section 2.5. These principles are further analysed within the land use planning framework in Chapter 3, within the context of EIA and SEA in Chapter 4, and within national development planning approaches for sustainable development in Chapter 5.

2.2 CAUSE FOR ENVIRONMENTAL CONCERN

Since the active environmental movement of the 1960s in the US, until the World Summit on Development and the Environment in Rio de Janeiro in 1992, there has been much literature

on the interrelationship between development and environment, and the challenge which faces the human race, i.e. the achievement of sustained and equitable development throughout the globe. The fact that more than 1 billion people are still living in acute poverty and are suffering from grossly inadequate access to resources - education, health services, infrastructure, land and credit - is a cause for concern. The poverty problem highlights the essential task of development, which is to provide opportunities so that these people, and hundreds of millions not much better off, can reach their potential [World Bank 1992].

While development is stressed, there is equal concern about whether environmental constraints will limit development, and whether development will cause serious environmental damage, in turn impairing quality of life of present and future generations. Developed countries are concerned with carbon dioxide emissions, depletion of stratospheric ozone, photochemical smogs, acid rain and hazardous wastes, while the poor in undeveloped and developing countries are concerned with the actual survival of the human race. The most immediate environmental problems facing these countries - unsafe water, inadequate sanitation, soil depletion, indoor smoke from cooking fires and outdoor smoke from coal burning - are different from and more immediately life-threatening than those associated with the affluence of rich countries. Since this thesis addresses problems in the developing countries, the following discussions mainly cover problems in the developing countries, although it is acknowledged that environmental problems are global in nature and are a common responsibility of both rich and poor nations.

It is not the intention of this section to be comprehensive in discussing the much-debated environmental problems and the interrelationship with development. However Table 2.1 illustrates the principal health and productivity consequences of environmental mismanagement, sufficient to define problems which are causes for concern, and to highlight the need for effective environmental management, particularly in developing countries.

Environmental problems listed in Table 2.1 are the results of 'development' which are actually economic activities that are related to economic growth which are strived for in order to raise standards of living. Ironically, as these activities draw on water resources; industries contribute to air pollution and produce solid and hazardous wastes; unrestrained forestry and improper agricultural practices result in soil degradation, and general practices result in loss of biodiversity and atmospheric changes; they also produce adverse effects on health and negative contributions to long term productivity.

The above situation brings together two strands of thought about the management of human activities: the need to achieve development goals and the the need to control or limit the harmful impacts of human activities on the environment. These two strands of thought led to international debates on the interrelationship between development and environment,

which subsequently led to the development of what is now termed 'sustainable development'. This concept is examined in the next section.

TABLE 2.1: PRINCIPAL HEALTH AND PRODUCTIVITY CONSEQUENCES OF ENVIRONMENTAL MISMANAGEMENT

Environmental problem	Effect on health	Effect on productivity
Water pollution and water scarcity	More than 2 million deaths and billions of illnesses a year attributable to pollution; poor household hygiene and added health risks caused by water scarcity.	Declining fisheries; rural household time and municipal costs of providing safe water; aquifer depletion leading to irreversible compaction; constraint on economic activity because of water shortages.
Air pollution	Many acute and chronic health impacts: excessive urban particulate matter levels are responsible for 300,000 - 700,000 premature deaths annually and for half of childhood chronic coughing; 400 million - 700 million people, mainly women and children in poor rural areas, affected by smoky indoor air.	Restrictions on vehicle and industrial activity during critical episodes; effect of acid rain on forests and water bodies.
Solid and hazardous wastes	Diseases spread by rotting garbage and blocked drains. Risks from hazardous wastes typically local but often acute.	Pollution of groundwater resources.
Soil degradation	Reduced nutrition for poor farmers on depleted soils; greater susceptibility to drought.	Field productivity loses in range of 0.5 - 1.5 percent of gross national product [GNP] common on tropical soils; offsite siltation of reservoirs, river-transport channels, and other hydrologic investments.
Deforestation	Localized flooding, leading to death and disease.	Loss of sustainable logging potential and of erosion prevention, watershed stability, and carbon sequestration provided by forests.
Loss of biodiversity	Potential loss of new drugs	Reduction of ecosystem adaptability and loss of genetic resources.
Atmospheric changes	Possible shifts in vector-borne diseases; risks from climatic natural disasters; diseases attributable to ozone depletion [perhaps 300,000 additional cases of skin cancer a year worldwide; 1.7 million cases of cataracts].	Sea-rise damage to coastal investments; regional changes in agricultural productivity; disruption of marine food chain.

Source: World Bank 1992.

2.3 SUSTAINABLE DEVELOPMENT CONCEPT

2.3.1 Development of the concept

The link between development and environment was realized over twenty years ago. The report *Limits to Growth* published by the Club of Rome in 1972 was among the first considerations of the possible links between global economic growth and natural resources. It contains the extreme view of several scientists who, after exploring a 'world model' which looks in particular at the viability of continued growth, concluded that capital investment must at some point be restricted, and that continuing development should concentrate on the most satisfying activities - education, art, music, religion, basic scientific research, athletics and social interactions. The book *Only One Earth* by Barbara Ward and Rene Dubos, also written in 1972, discusses the links between natural resource use, pollution and development. It considers the possibilities for, and problems associated with, economic growth, and stresses that present human needs must be met without compromising the needs of future generations [Hardoy *et. al.* 1992].

The above works possibly laid the foundation for the *Declaration of the United Nations Conference on the Human Environment* which was adopted at Stockholm in June 1972, the publication of the *World Conservation Strategy* in 1980 by IUCN, UNEP and WWF, and certainly contribute to the definition of 'sustainable development' in *Our Common Future* [the Brundtland Report] in 1987, which led to the world agreement on the link between development and environment in the World Summit on Development and Environment in Rio in 1992. However, the emergence of the concerns for development and environment in the late 1980s and early 1990s, when compared to the movement in the 1970s, show at least three changes in emphasis: the depletion of the stratospheric ozone layer and atmospheric warming; concern about the depletion of non-renewable mineral resources which has to some extent receded; and the wider acceptance that economic growth which seeks to minimize ecological damage needs to be met [IUCN, UNEP and WWF 1991, World Bank 1992, Hardoy et. al. 1992].

Since the WCS there has been a growing global acceptance that conservation is *not* necessarily the opposite of development. The Strategy emphasizes that conservation includes both protection and the rational use of natural resources. Conservation cannot be achieved without development to alleviate poverty and misery of hundreds of millions of people. The WCS officially adopted the term *sustainable development* which stresses the interdependence of conservation and development.

In 1987 the World Commission on Environment and Development [WCED] in its report *Our Common Future* advanced the understanding of global interdependence and relationship between economics and environment. This contributed significantly to the growing recognition of the need for sustainable development and international equity. In the same year the United Nations General Assembly adopted the *Environmental Perspective to the Year 2000 and Beyond* [United Nations General Assembly Resolution 42/186], which is to be a broad framework to guide national actions and international cooperation for environmentally sound development [IUCN, UNEP, and WWF 1992], incorporating concepts, ideas and recommendations from the WCED report.

In June 1992, 154 countries in the United Nations Conference on Environment and Development [UNCED], signed the *Rio Declaration on Environment and Development* and reaffirmed the Stockholm Declaration. Of particular strategic importance to the international community are the official agreements on five specific areas, namely:

- *The Rio Declaration on Environment and Development* which proclaims twenty-seven principles which recognize the integral and interdependent nature of the Earth and accepts certain principles which would facilitate the transition to sustainability, while recognizing the right to development and the principle of common but differentiated responsibility;
- *Agenda 21* which is a broad-based comprehensive programme of action which covers developmental and environmental issues in an integrated approach, and is needed throughout the world to achieve a more sustainable pattern of development for the next century;
- *The Statement of Principles on Forests* which is a non-legally binding authoritative statement for a global consensus on the management, conservation and sustainable development of all types of forests;
- *The Convention on Biological Diversity* which is an agreement between countries about how to protect the diversity of species and habitats in the world, and which can be used as a leverage to improve access to bio-technology; and
- *The Convention on Climatic Change* which is an agreement between countries to establish a framework for action to reduce the risks of global warming by limiting the emission of so-called 'greenhouse gases'.

The term 'sustainable development' which is widely used above is examined in the following section.

2.3.2 Definitions and thrusts

Sustainable development is such a wide-ranging and dynamic concept that there have been more than eighty-five definitions relating to its interpretations and methodologies for implementation [World Bank 1992, Hardoy *et. al.* 1992]. Pearce *et. al.* [1989] list twenty-four perspectives on sustainable development, out of which six are reproduced below for examination:

A. "There are many dimensions to sustainability ... elimination of poverty and deprivation ... conservation and enhancement of the resources base ... broadening the concept of development so that it covers not only economic growth but also social and cultural development ... the unification of economics and ecology in decision-making at all levels." [Prime Minister Gro Harlem Brundtland, Sir Peter Scott Lecture, Bristol, 8 October 1986].

B. "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:
   - the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and
   - the idea of 'limitations' imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

   ... In essence, sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human need and aspirations." [WCED, 1987. p. 43-44]

C. "... applied to the Third World ... directly concerned with increasing the material standard of living of the poor at the grassroots' level, which can be quantitatively measured in terms of increased food, real income, educational services, health-care, sanitation and water supply, emergency stocks of food and cash, etc., and only indirectly concerned with economic growth at the aggregate, commonly national, level. In general terms, the primary objective is reducing the absolute poverty of the world's poor through providing leasing and secure livelihoods that minimize resource depletion, environmental degradation, cultural disruption and social instability." [Edward Barbier, "The Concept of Sustainable Development", Environmental Conservation, Vol. 14 [No.2], 1987, p.101-110]

D. "The sustainability criterion requires that the conditions necessary for equal access to the resource base be met for each generation." [Pearce, "Foundations of an Ecological Economics", Ecological Modelling, Vol. 38, 1987].

E. "... sustainability might be redefined in terms of a requirement that the use of resources today should not reduce real incomes in the future..." [Markandya and Pearce, "Natural Environments and the Social Rate of Discount", Project Appraisal, Vol. 3 [No.1], 1988.

F. "We take development to be a vector of desirable social objectives, and elements might include:
   - increases in real income per capita
   - improvements in health and nutritional status
   - educational achievement
   - access to resources
   - a 'fairer' distribution of income
   - increases in basic freedoms.

> ... Sustainable development is then a situation in which the development vector increases monotonically over time." [Pearce, Barbier and Markandya, Sustainable Development and Cost-Benefit Analysis, London Environmental Economic Centre, Paper 88-01, 1988.]

Although their goals are similar, the six definitions reflect the various thrusts of 'sustainable development', which are summarised below:

Definitions	Thrusts
A [Gro Harlem Brundtland 1986]	• elimination of poverty and deprivation. • conservation and enhancement of the resource base. • broaden the concept of development to include economic growth as well as social and cultural development. • unification of economics and ecology in decision-making at all levels.
B [WCED 1987]	• meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. • the 'need' concept, particular of the world's poor, to which overriding priority should be given. • the idea of 'limitations' to economic development, imposed by the state of technology and social organization's ability to meet present and future needs. • sustainable development is a process of change in which exploitation of resources, direction of investments, orientation of technological development, and institutional change are in harmony.
C [Barbier 1987]	• increase in the material standard of living can be quantitatively measured in terms of increased food, real income, educational services, health-care, sanitation and water supply, emergency stocks of food and cash, etc. • primary objective is to reduce absolute poverty through leasing and securing livelihoods that minimize resource depletion, environmental degradation, cultural disruption and social instability.
D [Pearce 1987]	• the conditions necessary for equal access to the resource base must be met for each generation.
E [Markandya *et. al.* 1988]	• the use of resources today should not reduce real incomes of the future.
F [Pearce *et. al* 1988]	• development is taken as a vector of desirable objectives, and elements include: increases in real income per capita; improvements in health and nutritional status; educational achievement; access to resources; a 'fairer' distribution of income; increases in basic freedoms. • in sustainable development, development vector increases monotonically over time.

The above thrusts indicate that sustainable development is a normative philosophy, i.e. it has a moral undertone: concern for future generations and present poverty, although it is not clear how the two can be separated. Furthermore the two objectives of [i] making the present generation better off without making future generations worse off, and [ii] focussing current development on the most disadvantaged, may conflict [Pearce *et. al* 1993]. Nevertheless the

fourteen thrusts of sustainable development which are identified are reflected in the overall strategy which aims towards harmony among human beings and between humanity and nature. The pursuit of sustainable development therefore requires the following [WCED 1987]:

- a *political system* that secures effective citizen participation in decision-making;
- an *economic system* that is able to generate surpluses and technical knowledge on a self-reliant and sustained basis;
- a *social system* that provides for solutions for the tensions arising from disharmonious development;
- a *production system* that respects the obligation to preserve the ecological base for development;
- a *technological system* that can search continuously for new solutions;
- an *international system* that fosters sustainable patterns of trade and finance; and
- an *administrative system* that is flexible and has the capacity for self-correction.

The above requirements are actually goals for national and international actions on development, which are summarised in terms of the following policy directions [WCED 1987]:

- *Population and human resources*: how population numbers relate to available resources;
- *Food security* - sustaining the potential: need for effective incentives for developing nations to produce more food;
- *Species and ecosystems* - resources for development: the necessity for diversity of species for normal functioning of ecosystems, beside ethical, cultural and scientific reasons;
- *Energy* - choices for environment and development: need for sound and economically viable energy pathway that will sustain human progress into the distant future;
- *Industry* - producing more with less: need for technologies with promised higher productivity but with less pollution and risks; and
- *Urban challenge*: need to develop explicit settlements strategies to guide the process of urbanization, taking the pressure off the largest urban centres and building up smaller towns and cities, more closely integrating them with their rural hinterlands.

It is clear therefore that 'sustainability' and 'sustainable development' are not necessarily the same. Sustainability means "making sure that substitute resources are made available as non-renewable resources become physically scarce, and it means ensuring that the environmental impacts of using those resources are kept within the Earth's carrying capacity to assimilate those impacts " [Pearce *et. al.* 1993, p. 4]. Sustainable development broadens the concern

with output so that it embraces social goals other than GNP, and broadens the concern with inputs from natural resources alone to all other capital assets.

Given such complex, wide-ranging aims and scope, making the concept of sustainable development precise for implementation purposes is difficult. One cannot argue for preservation of all natural resources, since all development activities inevitably involve some land clearing, oil drilling, river damming, and swamp draining [World Bank 1992]. There are arguments that natural resources should be preserved in an aggregate sense, with losses in one area being made up in another area. These principles for sustainable development are examined in the next section.

2.3.3 Underlying principles

The term *sustainable development* has often caused confusion because of the interchangeable use of the term with *sustainable growth* and *sustainable use* although their meanings differ. *Sustainable growth* is actually a contradiction in terms, because nothing physical can grow indefinitely, while *sustainable use* is applicable only to renewable resources: it means using them at rates within their capacity for renewal [Pearce *et. al.* 1989].

Another confusion is between *sustainable economic development* and *sustainable economic growth*. To implement strategies for sustainable development, it is important first of all to clarify the meaning of *development* and *growth*. *Development* is defined as a 'change leading to improvement or progress'. *Economic development* is therefore defined as 'something to do with achieving a set of social goals; goals which may change over time and which therefore make *economic development* a moving target ... *Economic growth* is an increase over time in the level of real GNP per capita' [Pearce *et.al.* 1989]. Sustainable development and sustainable growth are interlinked. Achieving sustainable economic development without sacrificing an acceptable rate of economic growth could be defined as a problem of sustainable development.

A major component of sustainable development is the principle of inter-generational equity [WCED 1987; Pearce et. al. 1989; Blowers 1993]. This suggests a necessity to restrict development of environmental assets such as important habitats, high quality landscape, forests, non-renewable resources and so on. It also suggests the superiority of common rights over individual rights. Of paramount importance, this suggests a *strong need for rational planning of environmental resources*.

Pearce et. al. [1989] also suggests the *wealth bequest* concept in sustainable development. It involves providing *a bequest to the next generation of an amount and quality of wealth which is at least equal to that inherited by the current generation*. Such a constant

capital bequest is consistent with the concept of inter-generational equity, and places an emphasis on environmental conservation. There are two interpretations to this idea:

> [i] that the next generation should inherit a stock of wealth, comprising man-made assets and environmental assets, no less than the stock inherited by the previous generation;
> [ii] that the next generation should inherit a stock of environmental assets no less than the stock inherited by the previous generation."
> The difference between the two is ... the first stresses all capital assets, man-made and 'natural'. The second emphasizes 'natural capital only'.
> [Pearce *et. al.* 1989, p. 34].

The above interpretations assist in developing operational perspectives for sustainable development. These perspectives are discussed in section 2.3.4. Before that, it is beneficial to examine some environmental ideologies which form the basis for implementing sustainable development.

Table 2.2 identifies two environmental ideologies and the related approaches to sustainable development, thus producing four approaches to sustainable development [Pearce *et. al.* 1993]. The adoption of one approach, or a combination of two or more approaches, will determine the operational perspective to be adopted by each nation or organization at international, national or local levels of resource management.

The approaches in Table 2.2 bring to mind again the concept of transfer of capital bequests by Pearce *et. al.* [1989], in which two principles are involved:

[1] the current generation makes sure that it leaves the next generation a stock of 'capital' which is equal to what this generation has now; and

[2] 'capital' comprises the stock of 'man-made capital' [machineries and infrastructure, knowledge and skills or human capital] and stock of 'natural capital' [natural resources e.g. oil, gas and coal, biological diversity, clean air and so on]. Man-made capital and natural capital form the aggregate capital stock.

Pearce et.al. [1993] terms the 'constant capital rule' as *weak sustainability* in the sustainable development literature, because it means indifference to the form in which capital is passed on. This is based on the assumption that the forms of capital are completely substitutable for each other. Following this argument, the 'Cornucopian' approach in Table 2.2 is an approach for weak sustainability, and is therefore not desirable. The constant capital rule also means the environment is just another form of capital - there is no special place for it. This is related to the 'Accommodating' approach under the Technocentric ideology, and thus categorises it as an approach for weak sustainability, and hence is not very desirable.

Contrary to the Cornucopian approach, not all forms of capital are substitutable for each other. These are 'critical natural capital' - they are critical to well-being or to survival.

Examples include the ozone layer and the carbon cycle which are critical to prevent further global warming; and biological diversity, the loss of which threatens the primary life support functions of ecological systems, while its secondary values are for food exploitation, timber supply, recreation, etc. This leads to two variants of the natural capital rule:

[1] generally conserving natural capital; and

[2] highlights the role of critical natural capital and focuses on its conservation, with or without some rule for conserving overall natural capital.

TABLE 2.2: ENVIRONMENTAL IDEOLOGIES AND APPROACHES TO SUSTAINABLE DEVELOPMENT

A. TECHNOCENTRIC IDEOLOGY

1. "Cornucopian" approach

   - belief in extensive substitutability of the various forms of capital [man-made, human and natural].
   - belief that total costs of control of environmental problems outweigh the benefits of their control.

2. "Accommodating" approach

   - belief in the extensive scope for the decoupling of economic activity and environmental impacts.
   - faith in technical changes that can reduce environmental impacts each year.

B. ECOCENTRIC IDEOLOGY

1. "Communalist" approach

   - belief in more direct regulation and planning, since neither free nor adjusted markets can solve the problem.
   - belief that the scale of economic activity must be reduced i.e. in the scale of GNP or economic growth.

2. "Deep Ecology" approach

   - belief in regulations to achieve supreme environmental ends.
   - belief in spiritual revolution in which the majority at least voluntarily change their behaviour to accord with the overall objectives.

Adapted from Pearce *et. al.* 1993.

A sustainable development approach which looks at the overall stock of capital and pays special attention to the environment is termed 'strong sustainability'. Based on this, both the 'Communalist' approach and 'Deep Ecology' approach under the Ecocentric Ideology can be termed as approaches for strong sustainability. Both imply the need for conservation of natural capital, which is essential in view of the uncertainty about the way natural capital stocks work, and the problem of irreversibility of natural capital stocks. However of the two, the 'Communalist' approach is taken, in this thesis, to be more appropriate for developing countries, because of the greater flexibility in implementation.

2.3.4 Operational perspectives

Defining approaches to sustainable development is relatively easier than identifying measurements for sustainable development. An operational perspective on sustainable development involves moving beyond definition and toward identifying practical terms of reference for decision-making. This is the more difficult part. Apart from the complexity of the concept, this is also because of the prerequisite for decisions to be based on scientific information and not on fantasy [UK Government 1990].

To date, sustainable development has been mainly discussed at a global level, and even then there are very few techniques for measuring sustainable development at a national level, even by developed countries. Norway is one of a few nations which have developed a way of adjusting the System of National Account [SNA] to include accounting for the volume of stocks and flow of natural resources [Pearce *et. al.* 1993]. Therefore measuring sustainable development at the local level proves to be a more difficult task to be developed. Pearce *et. al.* [1993] have suggested one way of measuring sustainable development for the UK. The logic of SNA at the national level is also applicable to the local level, and therefore the proposed adjusted SNA by Pearce *et. al*, for the UK is summarised below as an illustration of how 'green' accounting works.

At the level of national economy, the SNA, which provides aggregate measures of economic activity in terms of GNP or GDP, is adjusted to include the environmental or 'green' factor. A set of monetary accounts of natural resources provides a basis for comparison with the more conventional measures, GNP or GDP. In the adjusted SNA, two new variables are added: the value of resource depletion [the interest is in the monetary change in the *quantity* of the stock], and environmental degradation [the interest is the monetary value of the change in the *quality* of the stock].

In money terms, Net National Product [NNP] is usually written as:

$$\mathbf{NNP = C + S - Detr.K_M}$$

where NNP = Net National Product
C = Consumption
S = Gross National Savings
Detr. K_M = deterioration of Man-made capital

In the adjusted SNA, Green NNP is written as:

$$\mathbf{gNNP = C + S - Detr.K_M - Dep.K_N - Deg.K_N}$$

where gNNP = 'green' Net National Product
Dep.K_N = depletion of natural capital
Deg.K_N = degradation of natural capital

In simplified terms, where natural capital is being used up, NNP > gNNP. gNNP is equal to consumption plus the value of savings [or investments], minus the sum of depreciation on the overall capital stock [man-made and natural capital stock]. In this sense, gNNP can be interpreted as sustainable income.

Although the logic is simple, calculating the values of resource depletion and environmental degradation is more difficult. To calculate resource depletion, two components to the price determinants need to be known: [1] marginal cost of extraction [MC] and [2] rental value which is interpreted as a payment to future generations for using a finite resource now. Information on MC is largely unavailable, so that empirical studies generally rely on average costs of extraction [AC]. Therefore where total rents have been estimated by using AC, depreciation is overstated and sustainable income [gNNP] is understated. The 'net price' method can also be applied to the depletion of renewable resources, but depreciation occurs only where overuse of this resource occurs, i.e. a rate of harvest over the rate of growth, so that the resource is being used unsustainably. This method is applicable to, for example, the forestry sector, where stocks and flows are usually valued as a stock and flow of harvestable timber using market prices.

The measurement of monetary value of environmental degradation [Deg.K_N] is more difficult, for example the measurement of the change in a stock of say, clean air, since there is no market price for this degradation, and hence the 'net price' method cannot be used as in the case of depletion. There is a need to bear in mind two main effects when assessing possible values of environmental degradation. One is the decrease in environmental quality which has implications on productive potential, and therefore future output i.e. an allowance must be made for 'asset erosion'. The value of environmental degradation could be measured by the potential costs of restoration or abatement; or the marginal costs of abatement or restoration; or the cost of returning the asset to an acceptable level of quality such as that set by a standard. Any unrestored degradation at the end of the accounting period will be 'carried over' and revalued in addition to degradation in the next accounting period. Second, negative changes in environmental quality will affect the well-being of individuals through the 'loss of amenity' i.e. from direct use and consumption of the services provided by the natural capital eg. recreation and beauty.

From the above technique at deriving gNNP i.e. sustainable income by Pearce *et. al.*, degradation of environmental quality [Deg.K_N] decreases sustainable income in the same way as Deterioration of man-made capital [Detr.K_M] and Depletion of natural capital [Dep.K_N]. It therefore forms the last deduction to obtain gNNP. Although Deg.K_N is not part of GNP as currently measured, because GNP mainly measures marketed transactions, it inclusion in the formula is considered logical, since sustainable development is a dynamic concept. The

problem is in the recording of natural capital stocks, specifically in finding a correct measure of extent of the resource [volume or weight that makes up the physical account] and applying an appropriate value to the units of extent [monetary account].

The technique of adjusting SNA to calculate gNNP is an attempt to reflect the logic of 'natural capital' school at the national level, where important decisions regarding the achievement of a sustainable development path are appropriately dealt with. The same logic can be applied to regional and local levels. However the mechanisms of natural capital is still largely unknown, and scientific discoveries are relatively slower than the need for development. In developing countries in particular, lack of information is a critical deterrent to making decisions on the basis of evidence. In view of this, when potential damage to the environment is both uncertain and significant, it is necessary to act on the basis of the *precautionary principle* [UK Government 1990 and 1994, English Nature 1992]. This principle is also consistent with Principle 15 of the Rio Declaration on Environment and Development [UNCED 1992]: "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation". Accommodating the principle that 'prevention is better than cure', conserving natural capital is especially important to sustainable development.

In line with the above principles, a more functional classification is made by English Nature [1992] which identifies sustainable development into two versions:

1. 'Trade-off' version which requires that environmental considerations are taken into account in policy formulation, but allowing such considerations to be traded off against other goods to generate the socially optimal or desirable results. This is synonymous with the 'weak sustainability' terminology.
2. 'Sustainability limits' version where environmental conditions act as constraints or limits on the achievement of other socio-economic goals, which is synonymous with 'strong sustainability'.

The 'trade-off' version requires evaluation of environmental costs and benefits and their incorporation into cost-benefit analysis, which is within the reign of environmental economics. This is particularly significant when there is a need to reconcile between competing economic, social and environmental requirements, such as in decision-making by national governments. The critical issue in this version is how to assign true costs and benefits to natural environmental resources which are dependent on value judgements as to their worth, and what aspects of the environment are tradeable [BANC 1990, English Nature 1992]. This involves a balanced accommodation of values and interests in the context within which it is undertaken, including meeting all goals at some minimum thresholds, while ensuring that no goal should be consistently promoted or discounted at the expense of the others.

There are no techniques to date which give acceptable valuations of the natural environment. The issue of uncertainty over the value of natural eco-systems and the stock of genetic capital are probably best dealt with by strict rules for conservation. Furthermore the problems with cost-benefit analysis may not arise from a failure to value environmental factors but from institutional defects in the decision-making framework. The prospects for incorporating renewable resources into an accounting framework is not very good at present, although there is a case for continuing research [BANC 1990].

The 'sustainability limits' version requires that, irrespective of any development, respect must be given to the *carrying capacity* of the environment. This is regarded as the maximum impact that the planet or any particular ecosystem can sustain [IUCN, UNEP, WWF 1992]. It implies the existence of limits to development and economic activity. Planning and development within the limits of carrying capacity means that humankind is dependent on the productive capacity of ecosystems, and that some minimal level of ecosystem integrity is essential to human survival. For most animal species, carrying capacity is defined as the maximum population that can be supported indefinitely in a given habitat without permanently impairing the productivity of the ecosystem[s] upon which it is dependent. For humankind, carrying capacity can be defined as the maximum rate of resource consumption and waste discharge that can be sustained indefinitely in a defined impact region without progressively impairing bioproductivity and ecological integrity. A crucial element of carrying capacity is that it is ultimately determined by the single vital resource or function in least supply [Rees 1988].

Carrying capacity in fact, is a function of many variables:

- the region in question, e.g. a watershed, the world;
- the type of resource in question, eg. water, energy, whatever resource would limit the growth of the human population;
- what is being 'carried', e.g. human population, noxious gas emissions;
- whether the resource is assumed to be constant or is changing over time, and whether it is renewable or not;
- whether what is being 'carried' is assumed to be constant or not;
- value judgements, e.g. ideal/optimum capacity versus maximum/minimum capacity.

... in order to ensure sustainability, carrying capacities should not be exceeded.
[Therivel *et.al.* 1992, p. 124-125]

To ensure that carrying capacity is not exceeded, the current state of the resource and its uses must be monitored; predictions must be made concerning the future state of the resource and its uses, and the possible use of alternatives; and mitigation measures must be made available to be implemented if the uses exceed, or threaten to exceed, the carrying capacity. These are problematic because it requires an understanding of how much of the resource is available, information which is difficult if not impossible to derive. In addition it is a dynamic situation, where technological innovations may affect carrying capacity.

Models of carrying capacity development to date by necessity tend to consider regions as self-contained and closed, while in reality regions are not closed, and the carrying capacity of one region is affected by that of another [Cocklin 1989]. In addition, inter-regional trade allows the carrying capacity of one region to be exceeded by depleting the carrying capacity of another [Rees 1988].

Another problem is that the types and uses of various resources are not known. Technological innovations can have major impacts [both positive and negative] on carrying capacity, which in turn relies on inherent value judgements and the use of biological standards against which the severity of an impact can be measured. The greatest uncertainty is the level of pressure that natural resources can withstand before they collapse [Therivel *et. al.* 1992].

The trade-off version and the sustainability limits versions are not mutually exclusive nor irreconcileable, but can be taken as successive stages of an environmental policy making process. However until more discoveries are made on techniques of 'trading off' valuable resources, the precautionary principle, which is more closely related to the sustainability limits version and carrying capacity concept, should be adopted. This is also in line with Jacobs' [1991] definition of sustainability: "that the environment should be protected in such a condition and to such a degree that environmental capacities [the ability of the environment to perform its various functions] are maintained over time: at least at levels sufficient to avoid future catastrophe, and at most at levels which give future generations the opportunity to enjoy an equal measure of environmental consumption."

The carrying capacity concept is within the confines of resource planning and management in general, and land use planning in particular. One of the ways of monitoring sustainability is to evaluate impacts of development on natural resources and ecosystems; and one of the ways, as suggested by Therivel *et. al.* [1992] is through Strategic Environmental Assessment [SEA] of all policies, plans and programmes which affect the environment, in the form of sectoral and/or regional SEA, and could be superimposed over habitat-based management plans. The main principle of these SEA is to evaluate development impacts on the carrying capacity of the ecosystem, in order to monitor sustainability and sustainable development.

The new approach for SEA is beyond the sectoral approach, which is consistent with the desired approach in sustainable development [Rees 1988]. There is emphasis on looking at development decisions which not only prevent environmental harm but positively enhance natural resources. There is a need to emphasize the need for a more integrated approach to potential land use strategies which look at land resource in terms of productivity, stability and sustainability. These would help to determine the best combinations of land use, while

accounting for the properties of the natural resource base [Therivel *et. al.* 1992]. These roles of SEA in resource planning in general and in land use planning in particular form the theme of this thesis, and their conceptual frameworks are examined in Chapter 3 [Land Use Planning] and Chapter 4 [EIA and SEA], and the planning approaches for sustainable development in developing countries in Chapter 5.

2.4 GOALS AND STRATEGIC IMPERATIVES

2.4.1 Goals and strategies

A report by the Town and Country Planning Association of the UK [1993] defines the aim and goals of sustainable development that should guide all decisions concerning future policies, plans and programmes. These are summarised in Table 2.3.

TABLE 2.3 : AIM AND GOALS OF SUSTAINABLE DEVELOPMENT

	AIM
	To promote development that enhances the natural and built environment in ways that are compatible with: • the conservation of the stock of natural assets. • avoidance of damage to the capacity of the world's natural ecosystems. • the need to achieve greater social equality. • the avoidance of the imposition of added costs or risks on succeeding generation.
	GOALS
Resource conservation	To ensure the supply of natural resources for present and future generations through the efficient use of land, less wasteful use of non-renewable resources, their substitution by renewable resources wherever possible, and the maintenance of biological diversity.
Built development	To ensure that the development and use of the environment respects and is in harmony with the natural environment, and that the relationship between the two is designed to be one of balance and mutual enhancement.
Environmental quality	To prevent or reduce processes that degrade or pollute the environment, to protect the regenerative capacity of ecosystems, and to prevent developments that are detrimental to human health or that diminish the quality of life.
Social equality	To prevent any development that increases the gap between the rich and the poor and to encourage development that reduces social inequality.
Political participation	To change values, attitudes and behaviour by encouraging increased participation in political decision making and in initiating environmental improvements at all levels from the local community upwards.

Summarised from Blowers 1993, pp. 6-8.

Table 2.3 indicates that the aim and goals of sustainable development strategies are towards development that is both *people-centred*, concentrated on improving human condition, and *conservation-based*, maintaining the variety and productivity of nature; in other words building a *sustainable society*. The principles are interrelated and mutually supporting, although they can be grouped according to their own unique functions [Table 2.4]. These principles could be used to review and adjust national and regional development plans in the light of sustainable development.

TABLE 2.4 : PRINCIPLES OF A SUSTAINABLE SOCIETY.

ETHICAL BASE:

- *Respect and care for the community of life.* Present development should not be at the expense of later generations. Management of human development should not threaten the survival of other human groups or other species or eliminate their habitats.

CRITERIA:

- *Improve the quality of human life.* Economic development is an important component of development, but it cannot be a goal in itself, nor can it go on indefinitely.

- *Conserve the Earth's vitality and diversity.* Conservation-based development requires the conservation of life-support systems, conservation of biodiversity and sustainable uses of renewable resources.

- *Minimize the depletion of non-renewable resources.* Their "life" can be extended, for example, by recycling or by substitution by renewable resources where possible.

- *Keep within the Earth's carrying capacity.* Policies that bring human numbers and life-styles into balance with nature's capacity must be developed together with technologies that enhance that capacity by careful management.

DIRECTIONS:

- *Change personal attitudes and practices.* Values that support the new ethic must be promoted by the dissemination of information through formal and informal educational system.

- *Enable communities to care for their own environments.* Properly mandated, empowered and informed, communities can contribute to decisions that affect them.

- *Provide a national framework for integrating development and conservation.* This could be achieved on a foundation of information and knowledge, a framework of law and institutions, and a consistent economic and social policies.

- *Create a global alliance.* This is an application of sustainability ethics at international levels.

Summarised from IUCN, UNEP, WWF 1991.

The definitions of sustainable development by WCED [1987], Barbier [1987] and Pearce *et. al.*[1989] reaffirm the World Conservation Strategy, in which nations are advised to implement strategies and develop policies, plans and programmes that reflect the interrelationships

between development and environment. WCED suggests several strategic imperatives for sustainable development, as outlined in Table 2.5. Strategies for sustainability require the enforcement of wider responsibilities for impacts of decisions which require changes in the legal and institutional framework that will enforce the common interest. Of equal importance is greater public participation in decisions that affect the environment.

2.4.2 Instruments of environmental action

The successful realization of the aim, goals and strategies of sustainable development through effective strategies, policies, plans and programmes need to be reinforced by the performance of certain over-arching functions [UNEP 1987; Starke 1991]. Instruments of environmental action could be grouped into planning, assessment, legislation and environmental law, awareness building and training, and institutions. Brief descriptions of these instruments are outlined below:

TABLE 2.5: STRATEGIC IMPERATIVES FOR SUSTAINABLE DEVELOPMENT

- *Revive Growth*: Economic growth must be stimulated, particularly in developing countries, while enhancing the resource base.
- *Change the Quality of Growth*: Sustainability, equity, social justice, and security are firmly embedded as major social goals.
- *Conserve and Enhance the Resource Base*: Sustainability requires the conservation of environmental resources such as clean air, water, forests, and soils; maintaining genetic diversity; and using energy, water, and raw materials efficiently.
- *Ensuring a Sustainable Level of Population*: Population policies should be formulated and integrated with other economic and social development programmes; education, health care, and the expansion of the livelihood base of the poor.
- *Reorient Technology and Manage Risks*: Technology development must pay greater regard to environmental factors.
- *Integrate Environment and Economics in Decision-making*: Decision-makers must be responsible over the impacts of their decisions upon the environmental resources capital. There should be focus on environmental damage rather than on the symptoms.

Source: WCED 1987, Starke 1990.

[a] PLANNING

A national socio-economic development plan should define and include within it its *national environmental objectives* and an allocation of investment resources which reflect a sensitivity to environmental constraints and objectives. There should be applications of *suitable methods, procedures and institutional arrangements* to make economic planning fully responsive to environmental constraints and opportunities, and consideration of the environment and *public participation in development*

decision-making. There should be inter-departmental co-ordination of policies and a unified direction for *integrating environmental concerns in development planning*.

[b] ASSESSMENT

Sectoral ministries should apply *EIA and cost-benefit analyses in decision-making* on development policies, plans, programmes and projects. Taxation and economic policies should encourage sectoral decisions in favour of environmentally-friendly technologies and locations, recycling and safe disposal of wastes, conservation of natural resources and establish *mutual support between environmental and economic objectives*. Reliable environmental information, obtained and analysed using modern technology, should be made available to planners and managers in a usable form.

[c] LEGISLATION AND ENVIRONMENTAL LAW

There should be more environmental legislation to *implement environmental standards* and to regulate activities of enterprises and people in the light of environmental objectives.

[d] AWARENESS BUILDING AND TRAINING

There should be programmes to *increase public awareness and participation* in environmental protection and improvement among voluntary action groups at the community level, national and global non-governmental organizations, scientific bodies, schools and universities, mass media and governments. Environmental information must be made available to the public in languages they understand, and in a form that can be easily related to their own situation. There should be more *international support* to training personnel in environmental planning, assessment and management especially in developing countries.

[e] INSTITUTIONS

To ensure that environmental objectives are met and sustainable development is achieved, *sectoral policies and practices should have internalised consideration of the environment*. Government institutions should have explicit responsibility and accountability for sustainable development and environmental protection within their sectors. Their policies, functions, structures and budgetary allocations should be made consistent with this. There is a need for authoritative mechanisms and procedures to oversee and ensure that national environmental objectives are met across government. *Essential functions should include planning and incentives, environmental assessment, legislative and regulatory advice, awareness-building and training, stimulation of research and application of its results*. To perform their

functions effectively, government institutions need the participation of other entities, particularly industry, non-governmental organizations and scientific community.

2.5 PLANNING AND DECISION-MAKING

In a plan-led system such as in the UK and Malaysia, development plans have a key role to play in achieving sustainable development, so that future generations are not denied the best of today's environment.

This thesis is centrally concerned with the role of land use planning and land use planners with regard to sustainable development. By planning towards sustainable development, land use planners would have contributed considerably towards sustainable use of earth's resources. The inclusion of sustainable development principles in land use planning would also be consonant with Principle 10 of the Rio Declaration which calls for public awareness and citizen participation in and access to information gathering, planning and decision-making processes, and judicial and administrative proceedings:

> "Environmental issues are best handled with the *participation of all concerned citizens*, at the relevant level. At the national level, each individual shall have appropriate *access to information* concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the *opportunity to participate in decision-making processes*. States shall facilitate and encourage *public awareness and participation* by making information widely available. Effective *access to judicial and administrative proceedings*, including redress and remedy, shall be provided."
> [UNCED, Rio De Janeiro, June 1992, p.4.]

At a global level, "the world's cities cannot remain prosperous if the aggregate impact of their economy's production and their inhabitants deposit wastes in global sinks at levels which ensure rapid climatic change" [Hardoy *et. al.* 1992, p. 189]. Therefore most action to achieve sustainable development has to be formulated and implemented locally. Hardoy et. al also identify at least four key policy areas to secure development sustainability at the local level:

1. respond to citizen demands for a safe and healthy living working environment;
2. penalize polluters, give incentives to encourage innovation in pollution reduction and resource conservation, encourage recycling and re-use, and reclamation of both non-renewable and renewable resources;
3. manage urban growth to promote minimal use of environmental capital while meeting social and economic goals; and
4. identify and support the development of new economic activities which enhance the economic base and its environment.

Whether it is the wealth bequest concept or the principle of intergenerational equity, development that meets the needs of the present without compromising the ability of future

generations to meet their own needs suggests a strong need for *rational planning of environmental resources over a very long term*. While the concept allows for interdependence of conservation and development, there are choices to be made between urban development, saving agricultural lands and forests, sustaining biological diversity and energy saving. While sustainable development is people-based it is also conservation-based [WCED 1987]. It must *improve the quality of life* while conserving the Earth's vitality and diversity, minimize the depletion of non-renewable resources and *keep development within the Earth's carrying capacity*.

To date there have been several moves to include principles of sustainable development in land use planning. Several examples of these are found in the UK, especially after the publication of *This Common Inheritance* [UK Government 1990]. Of particular significance are: the *Planning and Compensation Act 1991* which requires development plans to include policies for the conservation of the natural beauty and amenity of the land, and for the improvement of the physical environment; the *Town and Country Planning [Development Plan] Regulations 1991* which requires local authorities to take account of environmental considerations in their development plans; the *Development Plans and Regional Planning Guidance* [PPG12] of 1992 which encourages the integration of environmental concerns into development plans as well as undergoing an exercise for environmental appraisal of PPPs as they are being drawn up; and the *Environmental Appraisal of Development Plans: A Good Practice Guide* [DoE 1993] which provides guidelines for carrying out environmental appraisal in local authority planning departments.

Of the above, the last document is the most concise in terms of sustainable development principles. Adopting the precautionary principle, 'Guide' suggests that the basic guide for environmental appraisal of development plans is by assessing the impacts of land use proposals on environmental stock. This is also in line with the sustainability limit version of sustainable development. Three levels of concerns are identified, together with links between the key components of environmental stock that are amenable to planning influence, and conventional planning activities. The links are illustrated in Table 2.6.

Identifying these components of environmental stock that are amenable to planning influence is only the first step in environmental appraisal of development plans. The more difficult parts are recording environmental stock and assessing the impacts of development proposals on these stocks. Guidelines for these are provided in the guide.

The realization of sustainable development requires that decision-makers be responsible over the impact of their decisions upon environmental resources capital. In short, *environment must be integrated with economics in all levels and types of decision-making*. Since decision-making is in most cases political in nature, this means that sustainable

TABLE 2.6: ENVIRONMENTAL STOCK CRITERIA

General Criteria	Indicators of Positive Impact
GLOBAL SUSTAINABILITY	
- primarily concerned with atmospheric and climatic stability and with the conservation of biodiversity	
1 TRANSPORT ENERGY: EFFICIENCY - TRIPS	• reducing trip length • reducing the number of motorised trips
2 TRANSPORT ENERGY: EFFICIENCY - MODES	• increasing public transport share • increasing attraction of walking and cycling
3 BUILT ENVIRONMENT ENERGY - EFFICIENCY	• reducing heat loss from buildings • reducing capital energy requirements • increasing CHP potential
4 RENEWABLE ENERGY POTENTIAL	• safeguarding wind, water, wave and biomass potential • increasing direct solar gain
5 RATE OF CO_2"FIXING"	• increasing tree cover especially broad-leaved woodland
6 WILDLIFE HABITATS	• safeguarding designated sites [e.g. SSSIs] • increasing general wildlife potential [e.g. corridors]
NATURAL RESOURCES	
- husbanding of natural resources concerned with appropriate use and, where necessary, appropriate protection of our resources of air, water, the land and its minerals.	
7 AIR QUALITY	• reducing levels of pollutants [CO_2, SO_2, NO_x, Pb, etc]
8 WATER CONSERVATION AND QUALITY	• maintaining ground water and river levels • safeguarding water supply purity
9 LAND AND SOIL QUALITY	• safeguarding soil quality and soil retention • reducing contamination/dereliction • safeguarding good quality agricultural land
10 MINERALS CONSERVATION	• reduce consumption of fossil fuels and minerals • increase reuse/recycling of materials
LOCAL ENVIRONMENTAL QUALITY	
- conservation of local environmental quality concerned with the protection and enhancement [and sometimes retrieval] of local environmental features and systems ranging from landscape and open land to cultural heritage	
11 LANDSCAPE AND OPEN LAND	• enhancing designated areas [NPs, AONBs etc] • enhancing general landscape quality • retaining countryside/open land
12 URBAN ENVIRONMENT "LIVEABILITY"	• enhancing townscape quality • increasing safety and sense of security • improving aural and olfactory environment
13 CULTURAL HERITAGE	• safeguarding listed buildings and CAs • safeguarding archeological/geological value
14 PUBLIC ACCESS OPEN SPACE	• increasing/maintaining quality and availability in urban and rural areas
15 BUILDING QUALITY	• maintaining/improving the maintenance and continuous renewal of buildings

Source: DoE 1993

development requires planning and decision-making that concentrates political attention on the relations between growth, conservation and equality.

The high level of uncertainty and wide range of choices that have to be made in the realization of sustainable development may sometimes offer too much of a challenge to the idealized principles of rational planning. The solution to this problem is examined in Chapter 3 [Land Use Planning].

2.6 CONCLUSIONS

Environmental problems which have effects on health and productivity are consequences of environmental mismanagement. However stopping economic activities which exploit natural resources totally is not the answer, since there are more than 1 billion people who are still living in acute poverty and are suffering from grossly inadequate access to resources. Therefore sustainable development, which provides a positive link between development and environment is a welcome solution, especially to the poor. The Earth Summit on Development and Environment in Rio de Janeiro in 1992 makes all countries, rich and poor, responsible for the world environment. Everybody and all organizations too are given the task of ensuring that future generations are not deprived of today's best environment.

The 'communalist' approach under the 'ecocentric' ideology is the accepted approach to sustainable development in this thesis, since it is an approach for strong sustainability, i.e. in which environment is given a strong place in development consideration, and it looks at the overall stock of capital, instead of only natural capital or only man-made capital, for future generations. This approach, which gives emphasis on environmental conservation, is in line with the 'precautionary principle', and is a logical approach to adopt, in view of uncertainties and lack of scientific information on the natural resources. This also makes the adoption of the 'sustainability limits' version of sustainable development logical. The 'carrying capacity' concept, which is a critical factor of this version, is within the reign of resource planning and management, and hence is an appropriate approach to be adopted in land use planning.

To guide future policies, plans and programmes, a set of goals and principles of a sustainable society has been identified. These are complemented by a set of strategic imperatives for sustainable development. To achieve these, strategies, policies, plans and programmes need to be reinforced by the performance of certain over-arching functions. These are instruments of environmental action, which are grouped into planning, assessment, legislation and environmental law, awareness building and training, and institutions. Above all, the achievement of sustainable development calls for citizen participation throughout planning and implementation processes.

The importance of assessing impacts of development on the environment is apparent throughout the discussions on sustainable development. The link between sustainable development and land use planning which gives emphasis on a formal system and process of assessment of environmental impacts are examined in Chapter 3 [Land Use Planning] and Chapter 4 [EIA and SEA].

Chapter 3

Land use planning

3.1 INTRODUCTION

The term *land use planning* used in this thesis is within the context of its current interpretation of being a *multi-objective, multi-dimensional, multi-disciplinary and multi-decision making activity and process*. In land use planning, social, economic, political, psychological, anthropological and technological factors, which are concerned with the past, present and future, are integrated to produce an important output - use of land and its resources - which determines the lives of humans and related species which make up the human environment.

Land use planning, also known as *physical planning*, *urban planning*, *urban and regional planning*, *town planning*, *town and country planning* or *territorial planning* refers to planning with a spatial, or geographical component, in which the general objective is to provide for a spatial structure of activities [or land uses]. *Land use planning* is preferable to *physical planning* because the latter could lead to wrong interpretations to the layman of non-consideration of socio-economic-political elements which are very essential for determining land uses. The term is also preferable to *town and country planning*, or *urban and regional planning* because the latters could give interpretations of restricted spatial limits to planning. The term *land use planning* on the other hand is more flexible and dynamic, as the term does not provide any implication of a planning area which is limited to any spatial distinction. It can apply to spatial physical arrangements of land uses of a town or city, or countryside, region, nation and even international zones, or to national, regional and local policies which determine the spatial arrangement of the use and development of land. Therefore in this thesis, the term *land use planning* is used although *town and country planning* is more commonly used in the UK and in Malaysia.

Land use planning in general refers to the way land is owned, used and developed [Healey 1983]. Although land ownership brings in the issue of land policy and social and economic policies which are related to land ownership, this thesis is confined to policies which are related to land use and land development. This is because in many countries such as the

UK and Malaysia, land ownership has always been discussed separately from land use, although one determines the other. In Malaysia for instance, while land use is under the Town and Country Planning Act, land ownership is under the National Land Code. The notion of planning also denotes end-directed, forward-looking, co-ordinated activities. Therefore *development control* or planning control, which forms one of the many duties of a land use planner is excluded from the list of land use planning activities examined in this thesis.

The following sections describe the land use planning concept [section 3.2], its decision-making philosophy [section 3.3], and the role of land use planning towards the achievement of sustainable development [section 3.4]. This is followed by an examination of some land use planning instruments to determine the level of consideration of sustainable development issues in land use planning [section 3.5].

The major reference to the development of land use planning in the UK is intentional for two reasons: [1] modern land use planning system originated in the UK where the industrial revolution began; and [2] the UK land use planning system was also the 'inspiration', in fact the 'model' of land use planning in Malaysia. It is beneficial to examine the 'more mature' planning system in the UK against its 'protégé' in Malaysia. This chapter however does not describe or analyse the successes and failures, or the effectiveness of the land use planning system and process in the UK, or even provide a comprehensive description of its current system. The reference to the UK system is only for the purpose of tracing the philosophy and principles of modern land use planning. Reference to American or European land use planning is only made where they are related to the development of the discipline in the UK [and subsequently in Malaysia].

3.2 MODERN LAND USE PLANNING CONCEPT

Planning is broadly defined as "translating knowledge into action in the public domain" [Friedmann 1987]. Land use planning involves the translation of knowledge to action in the management of environmental change as well as social change, since social change is often responsible for environmental change and vice versa [McEvoy III and Dietz 1977]. The process includes the identification of strategy , achievement of goals, underlying norms and values, directions to follow, and actions needed to realize these [Healey 1989].

Modern land use planning in the UK became established as a result of specific social and economic problems which in turn were triggered by the Industrial Revolution towards the end of the eighteenth century. The movement hoped to eradicate social problems of overcrowding, poverty, ill health, unemployment, and insanitary and inadequate living accommodation [Hall 1982; Bruton 1984]. As societies progressed and norms and values developed together with the development of education and environmental awareness, land

use planning became more sensitive to environmental changes which accompanied economic development. Present day land use planning therefore has become "a part of a national exercise in social and economic planning" [Healey 1983].

This section examines the development of modern land use planning and identifies issues and principles which develop in the process of the management of environmental change.

3.2.1 Development of modern land use planning

Land use planning has undergone changes and modifications in its procedure, process, form and content, consonant with changes in the physical, social, economic, ecological and institutional elements which form planning components. Today environmental problems and the need for sustainable development are acknowledged as some of the main concerns. This is reflected in the changing form and content of land use or development plans in many countries, to be consistent with current issues and objectives. These developments reflect its dynamism and adaptability to current issues facing the social, economic and physical environment. Below is a brief discussion on the historical development of land use planning in the UK, in chronological order of the development of the following planning models:

- "Blueprint" physical planning model before the 1960s.
- Rational-technical decision model of the 1960s - 1980s.
- Interactive or "planning as debate" planning model proposed for the 1990s.

"Blueprint" physical planning model before the 1960s

"Blueprint" physical planning is based on a g*eneral consensus* on values and policy directions in the management of environmental change. The "blueprints" are physical concepts which translate urban management principles into programmes for physical urban development. They are mixtures of urban design, architectural and engineering principles, and public estate management considerations [Hall 1982; Bruton 1984; Healey 1989]. Concepts for the blueprints originated from two schools of thoughts: the *Anglo-American Tradition* and the *Continental European Tradition*.

[a] Anglo-American Tradition:

- *The Garden City concept* [developed by Englishman Ebenezer Howard in his book *Garden Cities of Tomorrow*, published in 1898] which established the principle of "working and living in a healthy environment". In this concept "settlements grow by cellular addition into a complex multi-centred agglomeration of towns, set against a green background of open country." This polycentric settlement with low-residential density development is called the *Social City*.

- *The standard sequence of planning: survey - analysis - plan* [developed by Scottish Patrick Geddes in his book *Cities in Evolution*, published in 1915] which recognized the principle of the relationship between man and his environment. This principle in a way reaffirmed Howard's concept and broadened the scope of land use planning from "town planning" to "town and country planning" i.e. the planning of whole regions encompassing a number of towns and their surrounding spheres of influence, instead of the planning of individual cities in isolation.
- *The "Broadacre City" concept* [developed by American Frank Lloyd Wright around 1930s] which made popular the completely dispersed low-density urban spread in America. This concept was developed as a result of the increasing use of automobiles.

[b] The European Tradition

- *The "linear city" concept* in which the city develops along an axis of high-speed, high-intensity transportation from an existing city, was developed by Spanish Arturo Soria Y Mata in 1882. This concept gained popularity because of several advantages: it exploits costly investments in transportation lines; provide easy access to near-by open countryside; and can respond automatically to the need for further growth, since it is not restricted by green belts of Howard's Garden City concept.
- *The higher-density apartment-type Garden City concept* developed by Tony Garnier [French] and Ernst May [German]. Garnier's garden city was a self-contained industrial city with higher-density apartment-type residential development. May's series of satellite towns developed on open land outside the built-up limits, separated from the city proper by a green belt but with higher-density apartment-type residential development instead of single dwelling units of Howard's Garden City.
- *The High-density residential development concept* developed by Swiss-born Le Corbusier, in his books *The City of Tomorrow* [1922] and *The Radiant City* [1933], which developed the principle of scale in analysis through the notion that densities could be varied locally to produce very different results while maintaining the overall density unaltered. With this principle Corbusier was able to achieve high overall densities - with up to 1,000 people to the net residential acre and more - while leaving the bulk of the ground unbuilt [Corbusier advocated 95 percent should be left open]. This concept is argued to be able to support highly efficient urban transportation and other infrastructure systems.

The above description indicates that early "town planning" was very much "physical planning". Problems of society and economy were seen in physical terms, with a physical or spatial solution. The exception perhaps is Geddes' principle of "survey - analysis - plan" in which planning starts with the world as it is, and then work with trends in the economy and society, rather than impose its own arbitrary vision of the world [such as in Corbusier's concept]. Geddes' principle perhaps marks the introduction of socio-economic framework in land use planning on a wider regional scale i.e. the emergence of *national/regional planning* and *regional/local planning*. These last two concepts are examined in sections 3.2.3.

Rational-technical decision planning model of the 1960s - 1980s

From pure physical planning concept of the nineteenth century until the 1950s, land use planning during the 1960s and 1970s took on a new emphasis on broad-based plans, stressing on basic policies rather than detailed land-use allocations; the new importance of transportation planning as perhaps the central element of physical planning at this scale; the link between city-region planning and economic planning; the use of computers in planning; the new emphasis on economic rationale in planning; the stress on environmental quality; the growing concern with social planning; and infusion of management techniques into local authorities and therefore their planning functions [Hall 1982, Healey *et. al.*1989].

The new approach originated from American management science, and the postwar Chicago school of planning. It was to bring knowledge to bear on public action through the organised interaction of political goals and values with technical analysis and evaluation [Friedmann 1987]. The "rational planning model" which is based on scientific knowledge is critical to both political and professional accountability. In this approach land use planners are policy analysts rather than town designers. Examples of output from this approach are the structure and local plans, although the latter are closer in form and content to the "blueprints" of the earlier approach.

The rational planning model refers to the *quality of decisions* [Mayerson and Banfield 1955] i.e. drawing proper conclusions from information. In this, values play an important role. The rational planning process starts from analysis of the situation and ends with reduction and elaboration, design of courses of action, to comparative evaluation of consequences. The model is rather similar to McLoughlin's systems view of planning. Inclusion of other considerations beside the physical form of development has made land use planning more complex than it was during the days of pure physical planning.

The rational planning model enforces significantly the two tenets of land use planning:

[1] *Land use planning is multi-objective*: the basic objective is not well understood; there are clearly more than one - economic growth, fair distribution of income,

social cohesion and stability, reduction of psychological stress, a beautiful environment, etc.

[2] *Land use planning is multi-dimensional*: most of the processes which need controlling are human processes which are less well understood and work with much less certainty than laws in the physical sciences.

Being a multi-dimensional activity, land use planning seeks to be *integrative*. It embraces social, economic, political, psychological, anthropological and technological factors. It is concerned with the past, present and future. Its responses to problems may be remedial, trend-exploitative, opportunity-seeking, anticipatory or visionary. Underlying all these is the importance attached to design and guidance of social systems, organizational structures and institutions [Rose 1984]. This scenario of land use planning is complex, but at the same time makes it more dynamic and adaptable to new challenges.

Interactive or "planning as debate" model proposed for the 1990s

There has not been any official recognition [in government or professional bodies] of the acceptance of this model as a new approach for land use planning in the 1990s. Although widely discussed today, this approach had its root in the late 1970s, when many planning decisions were made through negotiations, not based on design activity or the rational-technical model. Friedmann [1987] saw this as a new form of translating knowledge into action in the public domain. *Knowledge and reason are not applied to problems, but are generated through working with people about problems.*

This planning approach emphasises *interaction*, the way knowledge is developed and exchanged, and disputes resolved. Its emphasis is on the interaction between all parties involved in planning and management activities: the community, planners, decision-makers and bureaucrats. It is in line with this that Healey [1989] calls this approach *planning as debate*. Planning issues will be determined by those who are involved, and how they want to debate on it. The content of the planning debate is to be invented rather than predicted by professionals or politicians. The focus of the debate however is expected to be about the type of environment we want and the way we want to manage it. Key themes are expected to be local development strategies, quality of life, diversity and variety, promotion of aesthetic quality, and the development of widely-shared values about environmental conservation and ecological balance, i.e. current issues which affect the environment.

The "procedural and methodological" framework for this new planning model is yet to be formally acclaimed by the planning profession in Britain, such as the Royal Town Planning Institute.

3.2.2 Land use planning issues

The evolutionary character of land use planning goals and principles, which respond to socio-economic-political situation of the day, reflects the *flexible nature* of its process. It is not governed by fixed parameters: it changes over time and is shaped by various considerations including institutional, political and social, which by themselves are also fluid. It is not determined by scientific criteria and given norms. This does not mean that it does not have any technical basis. It is rather a technical activity which is set against a very complex socio-political framework [Cherry 1984].

Land use planning has been described as multi-dimensional and multi-objective. Throughout its historical development, its goals and objectives have multiplied and become more complex, together with the growing complexity of society and its environment. From the pure physical planning objectives of the "blueprint" planning approach, it has accommodated socio-economic, political and institutional objectives in the rational decision model approach, and a more strategic approach in the interactive planning model of the 1990s.

Table 3.1 illustrates the basic change in emphasis in the planning models; from the emphasis on plans [and plan-making] in the "blueprint" model, to decision-making in the rational-technical decision model, to actions in the "planning as debate" model. Issues that were and are still addressed are similar, although the latter two accommodate more socio-economic aspects. However the elements for sustainable development can be traced. It is noted that existing plans 'lean' towards the second model, although its full principles are not accommodated, such as planning by alternatives.

Of the three models, the rational-technical decision model is more systematic in plan-making, and provides better systematic guidance to decision-making. This is closer to the principles of EIA which is examined in chapter 4. The avenue for integrating Strategic Environmental Assessment into the land use planning process is more apparent in this model than in the other two. The Interactive Model however has accommodated environmental issues which are consonant with its role as the management of environmental change, and therefore is in line with planning for sustainable development.

3.2.3 Strategic planning

Ideally land use planning integrates, coordinates and at the same time is part of interrelated planning activities which operate in different areas [such as housing, health, education, social welfare, transport, employment], at different levels [such as national, regional, sub-regional, local], and through different agencies [ministries, *ad hoc* bodies, local authorities] to achieve

TABLE 3.1 : EVOLUTION OF LAND USE PLANNING ISSUES AND PRINCIPLES IN THE UNITED KINGDOM

THE "BLUEPRINT" MODEL BEFORE THE 1960s [(a)]

Land use planning focussed on plans and was seen as a means of overcoming poor housing and social conditions, and was mainly concerned with physical development which aims at:

- the *Use of land* to the best advantage;
- the maximum *improvement in physical conditions within the limits of available resources;*
- the *development and maintenance of surroundings of quality and beauty* that will inspire and enrich human existence at home, at work, and at leisure; and
- the *conservation of natural resources and beauty* and worthwhile historical and architectural creations of man.

THE RATIONAL-TECHNICAL DECISION MODEL BETWEEN THE 1960s - 1980s[(b)]

Land use planning focussed on decisions and was seen as providing the framework for the spatial development of urban and rural areas, but with strong policy aims related to:

- the need to have *concern for social issues*, such as problems of the inner cities;
- the need to *assist in economic development and regeneration* by improving the ability of the particular area to attract investment; and
- to *conserve and enhance the quality of the environment* in both town and country.

THE INTERACTIVE OR "PLANNING AS DEBATE" MODEL FOR THE 1990s [(c)]

Land use planning now focuses on action and is seen as the *management of environmental change*. Goals and objectives are derived from debates [interactions] about what kind of environment is aimed for and how to manage it, covering radical issues as:

- *strategies for local economic development* to address the interconnections between development possibilities in the context of the international economy, and their relation to local land, labour, infrastructure and environmental quality considerations;
- *promotion of "quality of life"* in terms of the economic, social, cultural and environmental dimensions of existence;
- *accommodation of diversity and variety*, reducing constraints, and accepting new forms of activity and organization;
- *promoting aesthetic quality and policies to "make producers pay"* for the environmental costs they create;
- *promoting environmental conservation and ecological balance*; and
- *promotion of "looseknit" urban regions*, interlinked by transport and telecommunications networks which increase rather than reduce access, and supported by positive policies to service new areas of development and recycle abandoned zones.

Sources: (a) Rose 1984, p.50.
(b) Creswell 1984, p.95.
(c) Healey 1989, p.9.

comprehensive social and economic changes. It gives physical expressions to more general social and economic policies in, for example, housing, social welfare, transport, health, education and employment in a way which promotes the physical environment and the living and working conditions of the people. This functional role of land use planning is performed by the translation of general sectoral policies in a wide range of areas into more detailed plans and proposals, which eventually lead to physical development on the ground [Solesbury 1974, Bruton and Nicholson 1987].

Ideally, if this process is to work effectively, there should be a national planning framework which coordinates and integrates all planning activities towards common goals and objectives. This framework is derived from the concept of strategic thinking, which is military in origin, but which has been translated into business management approaches and into public administration. Bruton [1984] quoted Diamond [1979] who translated strategic thinking into policy formulation in the context of "... each level of planning forms a strategic function for the level below and conversely is constrained by the strategic planning of the level above."

A summary which is most appropriate to the present discussion is by Solesbury [1981] when he summarized strategic thinking as meeting the following prerequisites for perfect planning and implementation:

"- acting purposively to *define a direction in which an organization as a whole would move*;
- focussing on the *interaction between an organization and its environment*;
- recognizing *uncertainty* both within an organization and in the environment outside it;
- establishing *longer term views* in which the full implications of day-to-day decisions can be considered;
- undertaking *wider ranging considerations of alternatives*, both for objectives and actions;
- constructing *hierarchies for decision-making* with the higher decisions constraining the lower;
- *co-ordinating the decisions and actions* of agencies with related objectives."

[Solesbury 1981, from Bruton 1984, p. 80].

Land use planning can be considered as part of a strategic planning process which aims towards securing social and economic change, since the goal involves some form of physical development. Diamond's prerequisites could be met through an idealized framework for strategic planning and implementation in the public sector, as summarized in Table 3.2.

The idealized strategic planning framework illustrates that land use planning is just one level of planning activity which contributes to the achievement of social and economic change aimed at in the upper levels in the national planning hierarchy [see Fig. 3.1]. The detailed structure should vary between countries, depending on the particular circumstances. In general however, the framework satisfies Solesbury's basic elements of strategic thinking.

3.2.4 Development plan system

The development plan system of England and Wales is the model for the development plan model in Malaysia. Therefore a description of the model is outlined here, to provide a comparison with the Malaysian model in Chapter 8. Much literature on the evolution of the development plan system in the UK, as well as its successes and failures has been written. However only a summary of the system is outlined here, mainly based on extracts from PPG 12 [DoE.UK. 1992a].

TABLE 3.2 : AN IDEALIZED FRAMEWORK FOR STRATEGIC PLANNING AND IMPLEMENTATION IN THE PUBLIC SECTOR.

Level 1: national objectives and policies for social and economic change

- nature of social and economic change;
- specific sectoral objectives and policies;
- interrelationship between sectoral objectives and regional and urban development;
- short-term allocation [five years] of resources for implementation.

Level 2: strategic and spatial implications

- strategic policies to set out the way in which national policies relating to both sectoral and regional development can be expected to affect major regions of the country;
- establishes the socio-economic strategy for the region;
- translating that socio-economic strategy into physical and spatial terms;
- ideally the plan should aim for complete spatial coverage of the whole country, based on areas which are socially, economically and physically integrated [ten to fifteen years time scale].

Level 3: local spatial implications

- regional strategies are translated into detailed local plans wherever appropriate and closely related to the availability of resources for implementation [time scale of no longer than ten years];
- serves as a guide to developers and provide a basis for co-ordinating public and private investment in development and re-development;
- provides important lead-in to implementation.

Level 4: resource allocation and financing

- programmes for investment in physical infrastructure are constrained by the general policies and resource allocation proposals of the higher levels of plan and policy formulation;
- sectoral programmes could be for areas larger than those covered by local spatial plans in level 3, for example for the same area as the physical planning strategy in level 2.

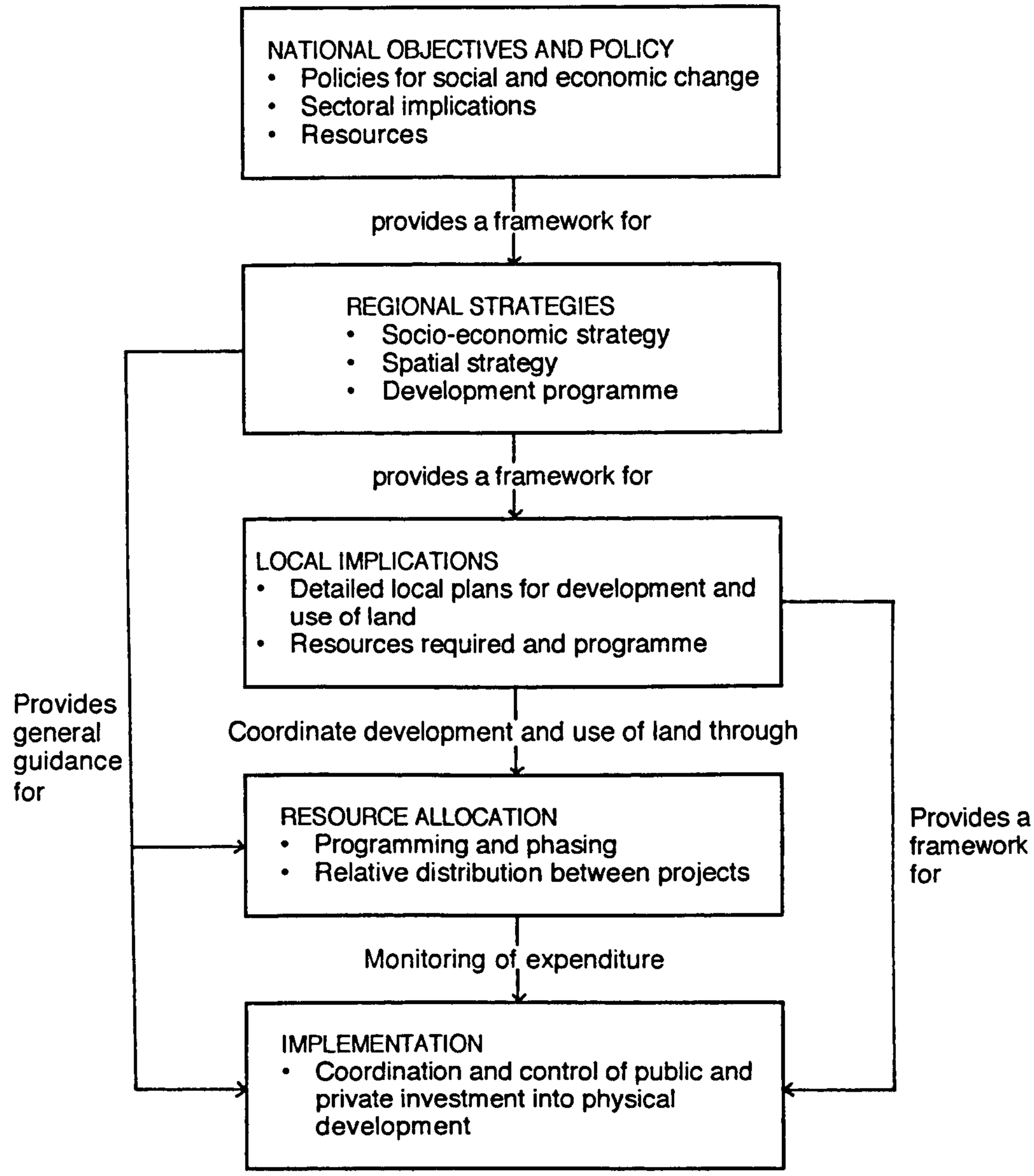
Level 5: monitoring of implementation

- ensure through careful programming that the required combination of resources is available at the required time to implement development proposals;
- monitor progress with development and expenditure to ensure that any departure from schedule and its associated 'underspend' or 'overspend' identified as early as possible, and appropriate remedies applied.

Summarised from Bruton [1984, pp. 82-85].

The Town and Country Planning Act 1971 [1971 Act] provides the statutory basis for the current land use planning system which provides for the preparation of development plans by local planning authorities in England and Wales. Recent changes have been made in the Town and Country Planning Act 1990 [1990 Act] and the Planning and Compensation Act 1991 [1991 Act], and are noted where appropriate.

FIG. 3.1 : AN IDEALIZED FRAMEWORK FOR STRATEGIC PLANNING AND IMPLEMENTATION IN THE PUBLIC SECTOR



Source: Bruton and Nicholson 1987, p.69.

The new provision of the 1991 Act on the development plan is that decisions on planning applications must "have regard to the development plan, unless material considerations indicate otherwise" [Section 54A].

The "development plan" is not a single document but comprises:

[a] In non-metropolitan areas:
- *Structure Plan* - Non-metropolitan County level
- *District or National Park Local Plan* - District/local level
- *Minerals Local Plan* - District/local level
- *Waste Local Plan* - District/local level

[b] In metropolitan areas:
- *Unitary Development Plan [UDP]* - Metropolitan county level

[c] In addition to [a] and [b]:
- Any development plan approved under the TCP Acts up to and including the 1962 Act, and not yet replaced by structure or local plan provision; and
- Any local plan saved under schedule 4 of the 1991 Act.

The form and content of the various types of plans are outlined below:

Structure Plan

The structure plan is to be prepared by every non-metropolitan county council. Authorities with more than one structure plan are required to replace them with a single structure plan for the whole of the county. The content and scope of the plan are:

- Provides the *strategic policy framework* for planning and development control locally;
- Ensures that *the provision for development is realistic and consistent* with any strategic guidance issued by the Secretary of State; current national and regional policies; resources likely to be available; social and economic considerations; and policies and proposals of any urban development corporations; and
- Secures consistency between local plans for neighbouring areas.

Local Plans

Each local plan is to cover a district planning authority area or a National Park area. Local plans provide local communities with the opportunity to participate in planning choices for their own area. Local plans are to reflect the values they place on different land uses locally. The local plans:

- Set out *detailed policies and specific proposals for the use of land*, within the strategic framework of the structure plan;
- Set out the local authority's *policies for the control of development*;
- Make *proposals for the development or use of land* and to allocate land for specific purposes; and
- May include proposals for action areas.

Minerals Local Plans

These plans may be combined with waste local plans or with National Park local plans, but not with district local plans. There is no power to prepare these plans in areas covered by UDPs, which must therefore contain minerals policies. The plans:

- Set out the authority's *policies for the supply of minerals*, within the strategic framework of the structure plan, and the required degree of environmental protection associated with development;
- Indicate areas where provision is made for *mineral working and the disposal of mineral wastes* and areas to be safeguarded for future working; and
- Set out the *development control criteria* for considering applications for mineral working, and requirements for the restoration of such sites.

Waste Local Plans

There is no power to prepare separate waste local plans for the metropolitan areas but they must appear as policies in the UDPs. Since the county planning authority or National Park authorities decide on applications for the deposit, treatment, storage, processing and disposal of refuse or waste materials other than mineral waste in the county, it may either prepare a separate waste local plan, or combine it with its minerals local plan. National park, which also has the same responsibility as the county planning authority as far as wastes are concerned, may choose between a separate waste plan and include the necessary policies in either the National Park-wide local plan or minerals plan. The waste local plans:

- Set out detailed land use *policies for the treatment and disposal of waste*, within the broad strategic framework of the structure plan;
- Must *complement the Waste Disposal Plans* [prepared by waste regulation authorities under the Environmental Protection Act 1990] which considers the types and quantities of waste arising in the area, the availability of disposal facilities and the need for further provision, and the pollution controls needed and appropriate methods of disposal in the future;
- Address the *land use implications* of authorities' waste policies; and
- Consider the *need for sites and facilities* in particular areas, suitable locations, and the planning criteria likely to apply, including geological, hydrological and other considerations.

Unitary Development Plan [UDP]

A UDP consists of two parts:

Part I

- This part is *analogous to the structure plan* in non-metropolitan areas. It consists of a written statement of the authority's general policies for the development and use of land in their area, having regard to any strategic guidance issued by the

Secretary of State; current national and regional policies; the resources likely to be available; social and economic considerations; and the policies and proposals of any urban development corporations which may affect their area. Part I *provides a framework for Part II.*

Part II

- This part is *analogous to the local plan* in non-metropolitan areas. It contains a written statement of the authority's proposals for the development and use of land; a map showing these proposals on an Ordnance Survey base; and a reasoned justification of the general policies in Part I and the proposals in Part II of the plan. The proposals in Part II must be in general conformity with the policies in Part I.

The above descriptions illustrate that the Development Plan system in England and Wales has a planning hierarchy in which the strategic planning guidance by the Secretary of State is at Level 1 in the idealized strategic planning framework; the structure plan is in Level 2 and the local plan is in Level 3. The existence of minerals local plans and waste local plans is noted by its absence in the Malaysian system. On the whole, the system ensures that social, economic and physical environments are protected, while development is not allowed where it is considered to be a threat to the environment, such as in the Green Belts.

3.3 PLANNING AND DECISION-MAKING

3.3.1 Planning process

After the Town and Country Planning Act of 1947, the land use planning process in the UK developed from Geddes' simple planning process of *survey - analysis - plan* to become a continuous cycle of *goals - continuous information - projection - simulation of alternative futures - evaluation - choice - continuous monitoring* [Hall 1982].

Several theories on the planning process have been developed. Three of the most popular are the *rational-comprehensive* approach [Banfield 1961], *disjointed-incrementalism* approach [Lindblom 1963] and *mixed-scanning approach* [Etzioni 1967], all of which fall within the rational-technical decision model of the 1960s-1980s. Goal formulation is fundamental to the rational-comprehensive approach which follows the process of *analysis - design - policy.* The disjointed-incrementalism approach rejects fundamentally the feasibility of formulating any social goals, and adopt the much more pragmatic problem-solving view of planning, because of the belief that goal-directed, comprehensive approaches are not only unattainable but positively harmful. The mixed-scanning approach postulated a realistic position between the search for full rationality and the adoption of pragmatic incrementalism,

that is to blend high-order social policy-making processes which set basic directions through an analysis of values, and low-order or technical processes which first prepare for fundamental decision-making. [Bracken 1981].

This thesis agrees with the belief that comprehensive approaches are unattainable and harmful, but accepts the rational planning model which was developed by the *Chicago School* in America in the 1950s. It is a *normative and goal oriented* approach which is needed for effective planning. This approach is more radical than problem-solving, trend-seeking or opportunity-seeking. If we are to aim for sustainable development goal, then the planning process in the rational planning model is the most practical in terms of planning and decision-making activities. This is because this approach adopts planning by creating a desired future [in this case sustainable development]. It decides on the desired future and allocate resources so that trends are changed or created accordingly, and this desired future may be based on present, predicted or new values. At the same time there is an allowance for an extensive modification of the future by aiming for what could be new predictions by changing values or goals, matching outcomes to desires, or avoiding and changing problems to ones easier to handle or to tolerate [Bracken 1981].

The rational planning model prescribes systematic and closely integrated steps towards decision-making: from analysis of the problems, the setting of broad objectives and the survey of available resources, to the establishment of specific operating targets [Faludi 1987]. In the 1960s, this planning-decision-making process was made more systematic by the systems view of planning, such as the process developed by Brian McLoughlin [1969]. From the decision to adopt planning, which is made after a scan of the environment, the land use planning process is now a cyclic process which starts with goal formulation and identification of objectives, study of possible courses of action, evaluation of alternatives, decision on action or implementation, and plan review and monitoring which leads to the review of goal and objectives again.

The problem with the rational planning model, which implies comprehensiveness, is the huge amount of data needed to formulate and evaluate numerous alternatives. As Voogd [1983] puts it: "in case one wants to pursue this concept, all conceivable alternatives must be identified and evaluated against all relevant objectives and means; otherwise, one could never be certain that the chosen alternative might be 'optimal'" [Voogd 1983, p. 7]. The most important criticism to this approach is the lack of sufficient data. This thesis therefore adopts the 'mixed scanning paradigm' suggested by Voogd, which is a comprehensive examination of parts of the system and an incomplete review of the rest. Although this paradigm also has data availability problems, it is more pragmatic than the full mode, and therefore is more achievable.

Because of the importance of plan evaluation, the stages of plan-formulation and plan evaluation should be merged in the planning process [Lichfield 1975]. There are two instances where the two could be integrated:

[a] *Evaluation and data collection*: data collection at the beginning of the planning process should be for both plan formulation and plan evaluation; and

[b] *Plan formulation [design] and plan evaluation*: A "good" plan cannot be chosen from a "poor" set of alternatives. Therefore evaluation relates back in the planning process to the problems of generating a range of suitable alternatives. The proposed method and criteria by which the alternatives are to be evaluated should be used to guide the process of plan formulation and so directly influence the nature of the plans produced.

Several illustrations of the planning process have been developed by several authors. Four processes each by McLoughlin [1969], Lichfield [1975], Hall [1982] and Wood [1988] have been selected as most systematic in terms of scope and content, links between stages, and the cyclical nature of the planning process. The four illustrations have been integrated into an idealized planning process [see Fig. 3.2]. The idealized planning process shows the interacting tasks and cyclical process which links formulation of goals and objectives, survey and analysis, plan formulation and implementation.

3.3.2 Public participation

Bruton [1987] cited theoretical political, communication and social issues which are implicit in public participation under the headings of three theories:

[1] *Political theory*: Democracy ranges from little or none to participatory which is characterized by wide discussion and consultation;

[2] *Communication theory*: There are two-way communication between the planner and the public. There should be more than one channel of communication, and they should have multiple entry points into the communication system; and

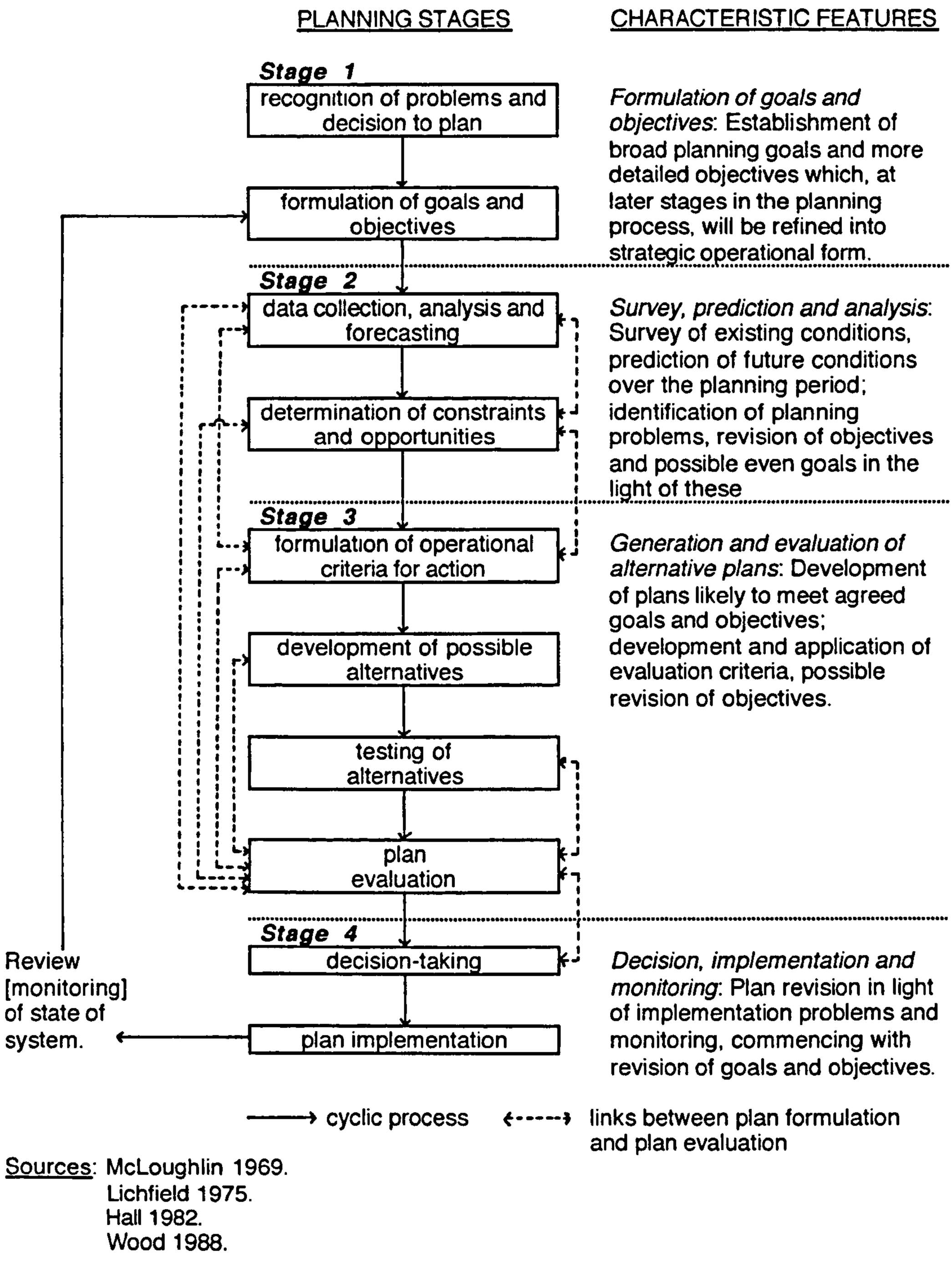
[3] *Social theory*: There are three perspectives on this, and each envisages a different role for public participation:

[i] *Consensus*: Planning is accepted as a technical apolitical exercise for the public interest, so participation is used to lead to consensus;

[ii] *Pluralist*: Society is seen as a diverse group with different values and planning as a political activity where politicians are the final arbiters; and

[iii] *Conflict*: There are conflicts between diverse groups with different values and interests and a continuing demand for scarce resources. Public participation is seen as a political activity where participants are concerned to gain a redistribution of power and resources.

FIG. 3.2 : THE LAND USE PLANNING PROCESS



Sources: McLoughlin 1969.
Lichfield 1975.
Hall 1982.
Wood 1988.

Public participation was introduced in the British planning system in the 1960s under the social theory i.e. with the consensus perspective. However later, it was realized that plan-making is about conflict, and that consensus is derived only through conflict. Bruton and Nicholson [1987] quotes:

> "The formal introduction of public participation in town planning would therefore seem to provide a framework within which these conflicts [or interest] can be clearly and formally articulated, rather than a device to achieve consensus ... experience of the outcome of public participation exercises in planning in the recent past would seem to suggest that motivation and an ability to bargain are ... important in resolving the conflicts inherent in the distribution of resources through local planning activities." [Bruton and Lightbody 1985, p. 155]

Goldsmith [1984] reports that studies of public participation in British structure planning reveal the existence of bias in the local political system towards the involvement of selected special interests [the "major elites"] and the middle class generally, in the opportunities for participation. There is also higher levels of motivations and skills necessary for participation among different groups and individuals in the community.

To help overcome the above, public participation should be a part of the decision-taking process. It should be an aid to informing political decision-takers of the attitudes of certain elite groups to planning proposals, and a process which can lead to distributional bargaining: to pressure and to trade-offs; where the role of the politician is to balance these pressures against the wider public interest.

This thesis agrees with Bruton and Nicholson [1987] that to enable the above arbitrating role to be performed successfully, politicians must be directly involved in evaluating public response to plan proposals. Such an approach would also strengthen the role of politicians in the planning decision-taking processes. However, the communication theory must also be adopted, for a two-way communication between the planner and the public would reduce misunderstandings on the part of the public, and provide more knowledge of public values to the planner.

3.3.3 Plan evaluation

Lichfield [1975] justifies the evaluation analysis with the conviction that it assists the process of decision-making, either of implementation, selection of an alternative, or recycling the process of plan-making, or generating of superior alternatives. He had suggested ways of merging the stages of plan formulation and plan evaluation in the planning process.

In his research on the way plan evaluation was in practice incorporated into the decision-making process in urban and regional planning, Lichfield formed this conclusion: "planning procedures in the UK has restricted the effectiveness of evaluation as an aid to choice between possible courses of action" [Lichfield et. al. 1975]. Two major findings are [1] evaluation was frequently treated as a discrete activity or left until too late for it to make an effective contribution to subsequent decision-making procedure; and [2] insufficient regard had been paid to the role of evaluation within the planning process. A brief examination of

several current development plans in the UK seems to show that the situation has not changed.

Lichfield et. al. suggested an *integrated planning process* in which there are linkages between evaluation and other planning activities. The suggested linkages are shown in Fig. 3.2.

The first question in plan evaluation is how well each design alternative or plan alternative meets the goals and objectives of the plan, either in a general sense, or [preferably] in terms of satisfying quantified performance criteria. Some goals and objectives are contradictory and must be resolved.

This thesis is concerned with the identification of evaluation methods which deal with problems of trading off environmental factors against economic and other considerations, or explore policy impacts systematically. To perform these, evaluation methods should identify *physical environmental impacts* [air pollution, water pollution, wildlife, noise, soil erosion, landscape aesthetics, outdoor recreation resources and the like], *social impacts* [health, education, unemployment, disability, crime, discrimination, community cohesion, and the like]; *economic impacts* [income, taxes, property values, prices of goods and services, and the like] and *political impacts* [public access to decision-makers, the concentration of power, opportunities for citizen participation and inequalities in election and selection processes, and the like].

An examination of six most popular evaluation methods are made here. They are based on the synthesis of several analysis on plan evaluation methods by Lichfield [1975] on the application of plan evaluation methods in practice in British urban and regional planning between 1970-1973; Adkins [1976] on the review of environmental content of structure plans in Britain; McAllister [1980] on evaluation methods in environmental planning in the USA; Breheny [1984] on urban policy impact analysis in the USA; and Friend and Hickling [1987] on the strategic choice approach. The six methods are:

Cost-Benefit Analysis [CBA]
Planning Balance Sheet Analysis [PBSA]
Goal Achievement Method [GAM]
Land Suitability Analysis [LSA]
Assessment of Resource Costs [ARC]
Strategic Choice Approach [SCA]

Cost-Benefit Analysis [CBA]

This method determines the extent to which each alternative plan will achieve a predetermined set of *goals* or *objectives*, which denote the aims of the plans. There are four main characteristics of this method:

i. Goals and objectives are formulated in advance of both the design of alternative plans and the analysis of their consequences;
ii. Objectives are said to be *multi-dimensional* [i.e. aesthetic, environmental, political, economic, etc.];
iii. The method has been designed to *compare mutually exclusive plans* only i.e. plans which represent alternative ways of tackling a particular problem;and
iv. Objectives used for evaluation are generally either assigned a "weight" to reflect their relative importance, or ranked in order of presumed importance *prior* to the comparative analysis of plan consequences.

A thorough CBA could include most of the environmental impacts that would be included in an EIA/SEA. However this is an expensive and lengthy exercise, with additional work to present monetary values and acceptable presentation of information similar to an EIA. Even then intangibles cannot be included. CBA does not offer a systematic approach to impact identification or specifically consider impact interactions, although it is the *most rational and scientific approach* to evaluation that has ever been available.

Planning Balance Sheet Analysis [PBSA]

This method was developed by Lichfield as an adaptation of the general approach of *Social Cost-Benefit Analysis* [SCBA] for use in urban and regional planning for two reasons:

[a] Because of the multi-sectoral nature of proposals, greater regard will have to be paid than in conventional application of SCBA [sectoral/project by nature] to those items which cannot be quantified or measured in common units. Therefore PBSA includes a statement of such items in the table as those for which valuations can be established but decision-taking could still be based on subjective judgements; and
[b] In the analysis, an attempt is made to determine the incidence of gains and losses on groups within the community.

PBSA is a convenient aid to tackling plan evaluation, particularly in the categorization of effects. The analysis is organized around affected groups of individuals. An evaluation has to consider costs and benefits and persons who experience those items. However it is generally easier to think about *who* and *in what way* they are likely to be affected. A comprehensive coverage of objectives is more likely to be achieved than in the abstractions about the purpose of the planning proposals that characterize some plan evaluation methods.

Lichfield included redistribution in PBS because he considered these aspects relevant in designing and evaluating alternative plans. However there is no guidelines here for impact identification.

Goals-Achievement Matrix [GAM]

This method was developed by Morris Hill because he felt that CBA and PBS did not satisfy fully the requirements of rational planning. In this method a set of ideals/objectives are formulated and defined in operational terms in order that measurements of the extent of their achievement by the plans may be obtained. The relative importance of objectives are established, this usually being denoted by a set of numerical values. The plan's levels of achievements are estimated for each objective in turn, and then weighted by the respective values of the objective [*the results being presented in a matrix*]. If practicable, the incidence of objective achievements for different groups in society should be traced. The weighted achievement levels of the objective are then summed up to give an overall index of objective achievement for each plan. This index value would then be adjusted to take account of the equity of the resulting distribution of gains and losses. This completes the comparison of the plans. Two distinguishing features of the method are:

i. Attention given to equity considerations; and
ii. Use of a hierarchy of goals

GAM is more demanding than PBS for detailed impact information. It requires estimates for all the groups identified and for each goal. Therefore this method is more recommended for evaluation of plans in a single sector. However intangibles cannot be included, and there is an unsystematic approach to impact identification.

Land Suitability Analysis [LSA]

This method was developed by McHarg as a method for evaluating public actions affecting land-use that focuses particular attention on the natural characteristics of alternative sites. It can be used to evaluate alternative sites for a particular use such as a highway, power plant, or regional recreation facility, or as an aid in preparing a complete land-use plan for a region or subregion.

LSA is guided by McHarg's philosophy that man and nature should not be viewed as separate. The main characteristics of LSA is *expert judgement based on scientific knowledge of natural environmental features.* It could either take the *quantitative approach* which uses the conventional method of assigning ratings and calculating a grand index - in this case of land suitability - or the *qualitative approach* which classifies land into ecological types to which land-use principles are applied for determining suitability.

LSA is not a comprehensive evaluation tool. Impacts are not made explicit but implied by scientific data. There is no impact identification procedure. It is primarily a method for organizing environmental information for land use decision-making and not an impact identification or analytical method. It is of little use for policy assessment or plan strategy evaluation.

Assessment of Resource Costs [ARC]

These are methods to estimate the value to the community of resources used up in undertaking urban and regional developments, particularly industries and housing. They are confined to examinations of inputs associated with alternatives where these include resources required in both establishing and operating projects. Two particular methods are most popular:

[a] *Costs-in-use*

This method may be termed as *per capita costs* for various phases in the implementation of projects or plans.

[b] *Threshold analysis*

This analysis concerns those physical characteristics of an area which would cause significant fluctuations in the unit cost of future urban development i.e. it *deals with costs which vary with locations* [both capital and operational]. A threshold is said to occur when new units of development cannot be constructed and serviced at their previous unit cost levels and substantial additional outlays are required. Changes in the unit cost of additional development may be caused by a variety of physical characteristics, for example the topography of an area or the physical capacity of public utility networks. Threshold cost items could include the cost of extending electricity supply, building new roads, or draining marshy area for new dwellings.

The main use of threshold analysis is considered to be in the initial narrowing down of the range of possibilities, which helps in selecting a manageable number for detailed investigation. However its relatively low level of sophistication does not make it suitable for finely detailed comparisons. It does not provide for impact analysis, nor provide any guideline for assessing environmental impacts.

Strategic Choice Approach [SCA]

The SCA was developed by the Institute for Operational Research [IOR] in the late 1960s. It concentrates on identification of options and their collective feasibility, making use of some methods now associated with EIA, such as Analysis of Interconnected Decision Areas [AIDA]. The environmental analysis in SCA is not systematic by EIA standards, but implications are noted on a detailed basis, i.e. for every policy option, an approach which is not inherent in any

other traditional planning method. The level of impact identification and use of environmental constraints depends very much on what is fed into the AIDA model as relevant decision areas and constraints.

SCA is *superior to EIA in terms of the approach for policy formulation*, because it is designed to formulate policies, while EIA is a reactive tool and is only a component of the policy-making process, because it is only applied once the action has been identified, be it a plan, policy, or strategy. SCA attempts to review cumulative, direct and indirect, short and long term, beneficial and adverse, reversible and irreversible impacts although a separate statement result is not produced. However, by virtue of how it operates SCA is more likely to systematically ignore environmental impacts than any other methods of evaluation. If it does, it merges generation and evaluation together, thus making post impact assessment redundant. However this process is expensive and time-consuming.

3.3.4 Decision-making

First of all the difference between *decision-making* and *decision-taking* should be distinguished. Decision-making should allow for free discussions between all those concerned, including planners. Decision-taking on the other hand involves the shouldering of political responsibility, and planners have no part in it [Faludi 1987]. This thesis concentrates on decision-making in the planning process.

Edgar A. Rose in "Philosophy and purpose in Planning" [1984] summarized the *multi-dimensional context of decision-making in land use planning* as "World-wide political and social developments ... suggests the necessity for an approach towards economic and social institutions which would permit a significant extension of political and economic democracy, and its corollary, more *individual responsibility for collective decisions* which govern our lives" [p. 50].

Faludi [1987] considers planning as "systematic decision-making" and a plan is an "entity which aims to make decisions systematic". The IOR school regards planning as "strategic choice" [Friend and Hickling 1987]. At the same time land use planning is associated with solving socio-economic and physical problems faced by societies through decision-making which, because it involves making choices, is political in nature. As such land use planning cannot escape from the influence of norms and values, whether in its problem-solving activities, or in its decision-making process [Hall 1982; Bruton 1984; Rose 1984; Healey et. al. 1988].

At each stage in the cyclical planning process, the relevant *actors* [planners, multi-disciplinary groups, decision-makers and policy-makers] have to deliberate on many issues

which are involved in environmental change which will result from any decision made. Identification of objectives for an example, will have a strong influence on the formulation of policies and proposals, just as much as the physical characteristics and socio-economic framework of the community. The selection of a development strategy for an area will have a big effect on the use of resources and their impacts on the environment.

As stated earlier, planning is the translation of knowledge into action, and decision-making involves discussions between all parties concerned, including planners. However all knowledge is uncertain and therefore entails arguments and dialogues. Therefore there is a need for a planning method which helps to structure those arguments and dialogues which precede decision-taking. The Chicago School laid this foundation in the rational planning model which emphasizes on the *quality of decisions*. Faludi summarised planning most aptly and argues for the integrated cyclical process of decision-making in planning:

> "*Planning ... thus centres on the making of decisions* and scheduled effectuations of policies. It takes form *in a number of closely integrated steps*, from the analysis of problems, the setting of broad objectives and the survey of available resources, to the establishment of specific operating targets; and through various succeeding steps until the results can be checked against the targets established and needed adjustments proposed." [Faludi 1987, pp. 141-142]

In the same year when EIA was legislated in the US, McLoughlin [1969] in his book on the systems approach to land use planning, discussed environmental problems which were faced by Britain at that time, namely pollution from industries and coal mines, risks from the nuclear industry and the damage that was being done to the natural environment as a result of urban development. His discussions were on the need to understand and nurture the environment. Two problems were posed:

[1] Ethical problems with choices and decisions on the relationship between men and all other forms of life and between human groups; and

[2] Problem of understanding the nature of the above relationships in order to create more effective and sympathetic controls over the problem.

McLoughlin quoted Arvill [1967] on the "need to *manage the resources* of the human environment, for man to create for himself a better relationship within nature if he is not to have an *irretrievably adverse impact on the environment*" [McLoughlin 1969, p.23].

The importance of clear identification of goals and objective of the land use plan to decision-making must be stressed. Thousands of decisions and sub-decisions are made towards the achievement of goals and objectives which have been identified in the planning process, until such a time when they are reviewed and amended. Without clear goals and objectives, the choice of courses of action to be followed is indeterminate.

Decision-making in the land use planning process inclines to be political in nature. Planning decisions do not really rely on the application of abstract scientific criteria or on objective, apolitical rational grounds of *common sense*. Instead it relies on value judgements which relate to what decision-makers consider as desired objectives, or should be. Cherry [1984] quoted the formulation of the British open space planning standards which changed from the National Playing Fields Association's figure of six acres per thousand population in 1924 to Abercrombie's ten acres, which shows that societal preference comes first; scientific validation of a kind comes second. This example illustrates that land use planning is an "interplay between value systems held by professionals, the bureaucracy, the community [and its various sub-sections] and politicians" [Cherry, 1984, p.184]. This view is reflected in its decision-making activity.

3.3.5 Land use planning and management in rapidly urbanising countries

There are much literature on the development of land use planning in developed countries such as the UK, USA, the Netherlands and France, but there are very few comparative analyses and syntheses of land use planning in the developing countries. In September 1989, an international group of urban managers, planners, and urban specialists from India, Philippines, Nigeria, Zimbabwe, Jamaica and Brazil, together with international consultants and urban specialists from Britain, met to discuss the future directions for planning and management of the rapidly growing cities of the developing world [Devas, 1989]. The conclusions of the meeting are very relevant to this thesis and therefore it is appropriate to include its summary in Appendix C. The main conclusions are outlined in Table 3.3. These new approaches will be reexamined in Parts 2 and 3.

3.4 PLANNING FOR SUSTAINABLE DEVELOPMENT

Sustainable development cannot be achieved merely by adopting strategies and policies. The Rio Declaration on Environment and Development pronounced that "In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it." [Principle 4, UNCED 1992]. This means that sustainable development is an *integrating concept*.

Since ecology is the basic field of study for the achievement of sustainable development, this section first examines the extent of the study of ecology in the present land use planning practice. This is followed by the translation of the sustainable development concept into the land use planning process. Being the most comprehensive document on the subject to date, a major source is the Rio Earth Summit. Then the conventional land use

planning concept is examined against the *messages from Rio* to determine its role towards the achievement of sustainable development.

The section ends with an examination of the performance of land use planning towards the achievement of sustainable development. It is stressed here that the results do not reflect the performance of the British land use planning system in sustainable development. The assessment of the consideration of sustainable development issues in land use planning is simply by assessing the basic principles of the planning instruments in general.

TABLE 3.3 : SUMMARY OF CONCLUSIONS FROM THE INTERNATIONAL WORKSHOP ON URBAN PLANNING AND MANAGEMENT IN RAPIDLY URBANISING COUNTRIES.

CRITIQUE OF TRADITIONAL URBAN PLANNING PRACTICE:

- Planners are not part of the local decision-making and management system for the city concerned;
- Delays in preparing and approving master plans result in developments which do not conform to the plans;
- Limited resources for implementation;
- Investments are drawn up without urban planners' involvement and without master plans;
- The planning system is based directly on legislation in use [or rather, formerly in use] in a developed country; and
- Fast deteriorating environmental conditions in and around the city.

NEW APPROACHES FOR URBAN PLANNING IN THE 1990s:

- Develop the city as the engine of economic development;
- Develop an environmentally conscious and sustainable system;
- Achieve a balance between needs and resources;
- Work on development within the land market;
- Develop and take advantage of the protecting and guiding functions of planning;
- Protect and enable the poor;
- Adopt a participatory approach;
- Adopt planning as a part of the urban management system;
- Develop a locally relevant strategic planning framework;
- Develop the institutional framework for planning;
- Practise urban planning as a five-finger exercise; and
- Improve commitments, reduce corruption and promote work ethics.

Source: Devas 1989.

3.4.1 Land use planning and ecology

Land use planning is an activity which is concerned with the rational allocation and exploitation of resources for man's short-term and long-term benefits, while ecology is the study of the basic components of these resources i.e. soil, water, air etc. Therefore land use planning and ecology have many common interests, and have long been associated with resource management. However "since the time of Geddes [an ecologist] the place of ecology has declined in planning circles as other professions and considerations, initially public health and engineering, latterly economic and sociological, have become more central ... ecological considerations have often been treated as minor components in planning issues, to be considered as an afterthought, once other issues had been settled." [Roberts and Roberts 1984, p.1]

If *environment* is categorized into *natural environment* [air, water, soils and organisms which provide the setting in which a plant or animal lives], *built environment* [areas of urban and industrial developments] and *social environment* [culture, law, economics, music etc.], then planning and ecology are clearly components of the environmental management system.

As scientists, ecologists are commonly trained in quantitative skills rather than those involving aggregation and value judgements which are crucial to the planning profession. Land use planners on the other hand, operate in environmental management at two levels: [1] concerned with stating goals, options and the broad-zonation of land use priorities involving the integration of agriculture, forestry, fishery, water catchment, conservation, recreation, urban and industrial development and transportation; and [2] involves development control in which specific proposals are appraised for their conformity with the overall goals and their appropriateness to specific location. In other words, the planner is the administrator and interpreter in the reconciliation of conflicting interests and demands. The planner's skill lies in the collation and interpretation of data and application of broad weighting in development control and larger components of balancing in policy plan preparation.

In the land use planning system such as in practice in the UK, there are several conflicts in the interaction between ecology and planning. Due to planning by "sectors" ecological factors are generally considered according to sectors such as landscape quality, ecology of flora and fauna, agriculture etc. This approach may lead to omissions of important consequences of an action or to conflicting policies due to overlap of areas of concern. Conflicts arise too because much of the activity in the rural areas are not subject to planning controls. This state of affairs can be regarded as a shortcoming in the development of modern land use planning.

3.4.2 Messages from Rio for land use planning

For the benefits of future generations, it is crucial that land use planners respond immediately to the call for sustainable development. In many cases, particularly in developing countries, the scope of planning by local authorities and government land use planners is narrow because of financial constraints, and because planning role has been generally restricted mainly to a controlling one - the prevention of harmful development. Until the last five years there has been little recognition of the positive role that land use planning can play in securing and facilitating a *good development*. If land use planners are to achieve the goals set out in *Our Common Future* and, especially, to stabilise and then reduce the emissions of greenhouse gases and other pollutants, it is vital that policy-makers in both the public and private sectors begin to plan for a sustainable society.

As examined in Chapter 2, the Rio Earth Summit proclaims twenty-seven principles which would facilitate the transition to sustainability, and Agenda 21 proposes a broad-based programme of action covering developmental and environmental issues in an integrated approach. Certain principles from the Rio Declaration and chapters of Agenda 21 can be translated into messages for land use planning. The most directly related are presented in Table 3.4. In summary, the message from Rio is that land use planning must be 'environment-led' and include environmental resource management. There must be integration of environment and development in decision-making, and there must be sustainable human settlements planning which integrate citizen participation in its planning and decision-making process, backed by strong, comprehensive planning laws which reflect modern understandings of natural resources.

The messages cover a wide range of issues, from planning principles to planning process, as summarised in Table 3.5. When examined against the land use planning process, the messages could be used as criteria for evaluating whether or not a planning activity is striving to achieve sustainable development.

Because so many of the problems and solutions addressed in Agenda 21 are related to local government activities, Chapter 28 of Agenda 21 is specifically on "Local Authorities' Initiatives in Support of Agenda 21", in which local authorities, among other responsibilities, are to oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and sub-national environmental policies.

TABLE 3.4 : WORLD'S RESOLUTION ON LAND USE PLANNING – MESSAGES FROM THE RIO WORLD ENVIRONMENTAL SUMMIT 1992

Resolution	Messages
Key Principles from Rio Declaration	
Development and environmental needs of present and future generations need to be met equitably [Principle 3]	[1] *Planning must address the meaning and practical consequences of "sustainable development".*
Environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it [Principle 4]	[2] *Development plans should be "environment-led"*
Environmental issues are best handled with the participation of all concerned citizens at the relevant level [Principle 10]	[3] *Major implications for public participation, information provision, community empowerment and subsidiarity in planning.*
States shall enact effective environmental legislation [Principle 11]	[4] *Need for strong, comprehensive planning laws which, as part of a wider body of environmental law, reflect modern understandings of natural processes.*
The precautionary approach shall be widely applied by States [Principle 15]; and environmental impact assessment shall be undertaken for appropriate developments [Principle 17]	[5] *Environmental statements should be used as a principal means of minimising damage and uncertainty.*
Key Principles from Agenda 21	
Need to change patterns of consumption; review the purchasing policies of agencies and departments; and sustainable use of renewable resources [Chapter 4]	[6] *Land use planning should include environmental resource management.*
Need to adopt innovative planning strategies;and guide cities along sustainable paths, involving citizen participation, resource inventories and energy and transport systems [Chapter 7]	[7] *There should be sustainable human settlements planning which integrate citizen participation in its planning and decision-making process.*
There is a need for environmental auditing, environmental assessment at all level, integrated data management and sustainable urban and rural spatial [Chapters 8 & 9]	[8] *There should be integration of environment and development in decision-making and integrated planning and management of resources.*
By 1996, most local authorities should have accomplished, on a collaborative basis, a "local Agenda 21" for the community [Chapters 227-31]	[9] *Institutions, particularly local authorities, and non-governmental organisations must play effective and efficient roles in environmental planning.*
There should be higher status for citizen groups, of which women forms a big group, in environmental decision-making [Chapter 24 & 36]	[10] *Education, increased public awareness and training in citizen participation in environmental planning must be enforced effectively.*

Developed after Selman 1993.

TABLE 3.5 : TRANSLATING THE MESSAGES FROM RIO INTO THE LAND USE PLANNING PROCESS

Planning Stages	Messages from Rio
1. Formulation of goals and objectives.	• Should be "environment-led". • Strong, comprehensive planning laws which, as part of a wider body of environmental law, reflect modern understandings of natural processes.
2. Survey, prediction and analysis.	• Must address the meaning and consequences of sustainable development. • There should be integrated planning and management of resources.
3. Generation and evaluation of alternative plans.	• Environmental statements should be used as a principal means of minimising damage and uncertainty. • Should include environmental resource management. • Citizen participation in planning and decision-making should be integrated.
4. Decision, implementation and monitoring.	• Information provision, community empowerment and subsidiarity in planning. • Institutions and non-governmental organizations play effective and efficient roles in environmental planning. • Effective education, increased public awareness and training in citizen participation.

3.4.3 New features in land use planning in the UK

Land use planning, by its general practice, is mainly concerned with urban development. Most environmentally-damaging processes are also urban, or urban-generated, and raise some major *town planning* issues. Even agricultural and forestry practices which cause most environmental concern are largely aimed at supplying urban consumers. A breakthrough was made in the UK's *This Common Inheritance* which gives attention to the question of urban areas in any attempts at achieving sustainable development. Previously, such issues had generally been neglected in the *green debate*, despite the fact that urban areas are obviously great consumers and polluters of the natural environment. There has also been a recent acknowledgement that although urban areas are a threat to the natural environment, they are also a precious resource in their own right. Therefore the sustainability debate has been broadened to encompass the relationship between natural and built form environments, and by extension, the question of urban quality of life.

In response to urban planning issues and their relationships with sustainable development, Breheny [1990] has developed the concept of 'sustainable urban development' concept, which is a translation of Pearce *et. al.*'s notion of 'sustainable development subject to constant improving natural capital stock [Pearce 1989] into

sustainable *urban* development subject to constant or improving natural capital stock and man-made capital stock' [Breheny 1990]. The concept is illustrated in Fig. 3.3.

Based on Breheny's translation it is deemed wise to look upon urban sustainability as involving the achievement of urban development aspirations, subject to the condition that natural and man-made stocks of resources are not so depleted that the long term future is jeopardised. With this is mind, planning for sustainability would encompass planning concepts such as urban form, new settlements, settlement patterns, transportation pattern and spatial patterns, all of which are integrated with natural and man-made capital stock.

FIG. 3.3: TRANSLATION OF THE CONCEPT OF 'SUSTAINABLE DEVELOPMENT' TO 'SUSTAINABLE URBAN DEVELOPMENT'.

URBAN DEVELOPMENT

should be:

SUSTAINABLE URBAN DEVELOPMENT

but subject to:

CONSTANT NATURAL CAPITAL STOCK

CONSTANT MAN-MADE CAPITAL STOCK

giving:

INTRA & INTER-GENERATIONAL URBAN EQUITY

Source: Breheny 1990

As mentioned in Chapter 2, the UK government has made a start in integrating the sustainable development concept into land use planning. The most prominent evidence is in the production of four important documents: *Our Common Inheritance* [DoE.UK. 1990]; *Policy Appraisal and the Environment* [DoE.UK. 1991]; *PPG 12: Development Plans and Regional Planning Guidance* [DoE.UK.1992a] ; and *Environmental Appraisal of Development Plans: A Good Practice Guide* [DoE.UK 1993]. Although these documents have deficiencies in providing guidance for achieving sustainable development, they represent a good attempt towards elevating land use planning towards the achievement of environmental quality, which is one of the aims of sustainable development.

One of the main themes of *Our Common Inheritence* is the need to integrate environmental concern into all policy decisions. On land use planning, the system has a clear strategic role for the county authorities. There is a need to update planning guidance to ensure that it reflect the concerns of sustainability, and that sustainability is designed into every development and planning policy. There is seen to be a potential role for new

settlements as a possible answer to the demands of sustainable development, such as having a correct balance between the demand for more housing and the safeguard of the nation's environmental heritage. The Paper calls for an interaction between planning and transportation to ensure that people have a choice of mode and location. There is a call for energy efficiency and recycling of land and a concerted effort to implement The Environmental Protection Act 1990 which enforces the concept of integrated pollution control.

Policy Appraisal and the Environment is prepared as a guide for policy planning. There is no requirement nor obligation for government agencies to implement its proposals. There is little mention of sustainable development, although it acknowledges the possibility of cumulative, secondary and indirect effects of policies. It emphasizes the value of making choices, such as the do-nothing option and trade-offs between objectives.There is very little guide on environmental appraisal methods other than mainly the use of cost-benefit analysis. There is also very little stress on consultation and public participation in planning and decision-making.

The major point in the *PPG 12* is the weight that should be given to environmental considerations in development plans. However there is no guidance on this, and the definition of environmental appraisal that it gives includes analysis for financial, social and environmental effects. There is also no guidance on the process for environmental considerations in development plans, although it does refer to *Policy Appraisal and the Environment*. There is also no provision for environmental appraisal to be applied to policies in the regional guidance. However some of these limitations have been overcome in the last document, as described in Chapter 2.

The four documents by the UK government do not provide clear guidance on the scope and format, nor on planning and decision-making procedures that should be adopted for planning towards sustainable development. Nevertheless they have succeeded in increasing awareness on environmental issues and individual responsibilities to work towards sustainable development.

3.4.4 Consideration of sustainable development issues

The examination of the sustainable development concept has produced the verdict that conservation is *not* necessarily the opposite of development. One should not expect any conflict between land use planning instruments and sustainable development issues. However an evaluation of major land use planning instruments has identified those instruments with high [H], medium [M] or low [L] levels of consideration of sustainable

development issues, while some instruments do not seem to have any significant consideration or the potential to do so.

Table 3.6 shows 26 sustainable development issues [identified in Chapter 2] on the y-axis and 21 land use planning instruments on the x-axis, giving a total of 546 "cells" which represent their links or relationships. Out of these 546 cells, 301 i.e. 55 % of the cells are marked 'x', indicating a significant link or the potential to include assessment of environmental impacts, which is considered a significant task for sustainable development. The exercise is based on very simple ratings; no weights are attached to the relative importance of each land use planning instrument or sustainable development issue. The rating is simply based on qualitative assessments of descriptions of principles and characteristics of these instruments in the previous sections.

Referring to Table 3.6, the criteria used for rating levels of consideration of sustainable development issues by land use planning instruments marked A-Q include: [i] whether the sustainable development issue is already a land use planning goal/issue attached to the instrument; [ii] whether there is flexibility in the methodology or procedure to accommodate new elements or analysis for consideration; and [iii] whether the instrument possess a systematic procedure for assessing environmental impacts. The rating method is explained at the bottom of Table 3.6. Different criteria are used to rate the level of consideration of sustainable development issues in the land use decision-making activity [columns R-U]: [i] whether consideration of environmental impacts is already in-built in the current practice; [ii] whether it is feasible to include new issues [sustainable development issues] in the current practice; and [iii] whether the task of including sustainable development issue in the current practice is too major to be cost-effective. The results indicate which land use planning instruments have high , medium or low levels of consideration of sustainable development issues, as illustrated in Table 3.6.

The overall result shows a fair level of consideration of sustainable development issues by land use planning instruments. It is significant that all the "medium" levels of consideration are due to the lack of a formal systematic procedure for assessing environmental impacts, which is considered a vital factor in achieving sustainable development. Those with "low" considerations are mainly due to the lower flexibility in the methodology/procedure to enable planning instruments to include new elements effectively.

Generally sustainable development goals are already included in planning goals which are identified with planning models, development plans, and planning process. However plan evaluation methods are less satisfactory in this, either because of the major emphasis on economic analysis or the lack in the assessment of environmental impacts. On the whole there is very little significant link between the achievement of sustainable

TABLE 3.6 : CONSIDERATION OF SUSTAINABLE DEVELOPMENT ISSUES IN LAND USE PLANNING INSTRUMENTS

SUSTAINABLE DEVELOPMENT ISSUES / LAND USE PLANNING INSTRUMENTS	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
	Planning Models				Development Plan			Planning Process				Plan Evaluation						Decision Making			
GOALS																					
Resource conservation	L	M	M	M	M	M	M	M	M	M	M	M	M	M	L	L	M		H	H	L
Built environment in harmony with natural environment	M	M	M	M	M	M	M	M	M	M	M		M	M	M		M		H	H	L
Environmental quality		M	M	M	M	M	M	M	M	M	M		L	L	M		M		H	H	L
Social equality	L	L	M	M	M	M	M	M	M		M		M	L			M	M	L	M	L
Public participation	L	M	M	M	M	M	M	L	L	M	M							H	H	M	L
PRINCIPLES																					
Respect and care for community of life	L	L	M	M	L	M	L	M	L	M	M							H			
Improve quality of human life	L	M	M	M	M	M	M	M	L	M	M							M	L	L	L
Conserve earth's vitality and diversity		M	M	M	M	M	L	M	M	M	M	L	M	M	L		M		L	H	L
Minimise depletion of non-renewable resources		M	M	M	M	M	M	M	M	M	M				L		M		M	M	L
Keep development within Earth's carrying capacity	L	M	M	M	M	M	M	M	M	M	M				M		M		M	M	L
Change personal attitudes and practices						L			L	L								M			
Community care for the environment				M		L	L											M			
National framework for integrating devt. and environment		M		M	M	M	M	M	M	M	M								L	M	
Create a global alliance				M																	
Strategic choice				M	M		M				M								H	H	L
STRATEGIC IMPERATIVES																					
Revive growth		M	M	M	M	M		M	M	M	M	L	M	L			M		H	H	L
Change quality of growth		M	M	M	M	M	M	M	M	M	M	L	M	L			M		L	L	L
Conserve and enhance resource base	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	L	M		H	H	L
Sustainable level of population				M	M	M		M		M	M								H	H	L
Reorient technology and manage risks				M			M														
Integrate environment and economics in decision-making		M	M	M	M	M	M	M	M	M	M								H	H	L
INSTRUMENTS FOR ACTION																					
Planning	L	M	M	M	M	M	M	M	M	M	M							H	H	H	L
Environmental Assessment							L			L	L	L	L	L	L		L	H	L	L	L
Legislation and environmental law				L			L														
Awareness building and training				L														M	L	L	L
Institution																					

REFERENCE FOR RATINGS: H = High consideration; M = Medium Consideration; L = Low Consideration; Vacant cell = No significant consideration

TABLE 3.6: [CONT.]

NOTES:

LAND USE PLANNING INSTRUMENTS:

Planning Models
A Blueprint planning model
B Rational-technical decision model
C Interaction/planning as debate planning model
D Strategic planning

Development Plan
E Structure Plan / UDP Part I
F Local Plan / UDP Part II
G Minerals / Wastes Local Plan

Planning Process
H Formulation of goals and objectives
I Survey, prediction and analysis
J Generation and evaluation of alternative plans
K Decision, implementation and monitoring

Plan Evaluation
L Cost-Benefit Analysis [CBA]
M Planning Balance Sheet Analysis [PBSA]
N Goal Achievement Method [GAM]
O Land Suitability Analysis [LSA]
P Assessment of Resource Costs [ARC]
Q Strategic Choice Approach [SCA]

Decision-Making
R Public Participation
S Resolve Conflicts
T Strategic Choice Approach
U Consideration of impacts on the environment

CRITERIA FOR RATINGS IN COLUMNS A - Q:

[a] Sustainable development issue is already considered as a goal/issue in the planning instrument.
[b] There is a flexibility in the methodology/procedure to accommodate new elements and analysis.
[c] There is a systematic procedure for assessing environmental impacts.

THE RATING METHOD FOR COLUMNS A - Q:

The rating [whether H, M or L] for each cell depends on the number of points scored by each instrument in relation to the sustainable development issue. If an instrument complies with only criteria [a], the score is 1; if it complies with criteria [a] and [b], or any combination of two, the score is 2; if it complies with all three criteria, then the score is 3. The rating given in the cell is according to the following:

Score of 3 points	- High consideration	H
Score of 2 points	- Medium consideration	M
Score of 1 point	- Low consideration	L
Score of 0 point	- Insignificant [vacant cell]	

THE RATING METHOD FOR COLUMNS R - U:

The rating depends on whether the instrument satisfy any of the following criteria:

• Sustainable development is already 'in-built'	- High consideration	H
• Feasible to include sustainable development issue	- Medium consideration	M
• It is a major task to include sustainable development issue	- Low consideration	L
• No significant potential	- Vacant cell	

development and plan evaluation methods. The decision-making activity fares better, perhaps because of the political nature of the latter.

The development of strategies for sustainable development can be fairly satisfactorily integrated in the development plans and be included in the planning process, but there is less link with planning models, and particularly poor with plan evaluation models. Decision-making activities too perform relatively well, except in public participation. However on the whole land use planning has the instruments and potentials to plan for sustainable development.

The evaluation exercise suggests that if land use planners are to perform their responsibility towards the achievement of sustainable development, land use planning instruments have to be improved and strengthened accordingly to meet most if not all sustainable development goals, principles, and strategic imperatives. It is obvious that plan evaluation methods and decision-making activities need to be reformed to include environmental impact assessment, and public participation to be strengthened if it is to be more effective in decision-making. Land use planning as a whole needs to be strengthened in terms of its environmental component in order to be a stronger instrument for planning for sustainable development.

3.5 CONCLUSIONS

The flexible, multi-objective and multi-dimensional nature of land use planning provides great opportunities for the integration of social, economic and environmental issues in determining trends of development. Development plans which are prepared within the strategic planning framework can be effective instruments for achieving social and economic objectives as well as managing environmental change. If governments are to honour their agreements in Rio, then land use planning needs to be strengthened, to give more emphasis on quality of human life while managing a sustainable use of resources. A more effective participatory approach in planning and decision-making will contribute towards equity and equality and the promotion of community care for the environment.

The philosophy and purpose of land use planning provides great potentials and opportunities for widening its scope to meet the demands for sustainable development. Theoretically sustainable development goals are already integral components of the land use planning activity. They are evident in the planning models, development plans, planning process and issues which are considered in decision-making. However evaluation methods in land use planning generally do not have systematic procedures for assessing environmental impacts, an issue that is very important for the achievement of sustainable development.

Therefore these methods need to be strengthened to include environmental impact assessment procedure in one form or other. The planning process as a whole needs to be reviewed so that it integrates within it goals and principles of sustainable development, and so that land use planning, on its own, is an effective instrument of environmental action.

Chapter 4

EIA and SEA

4.1 INTRODUCTION

The examination of sustainable development in Chapter 2 and land use planning in Chapter 3 has highlighted the need for rational planning of environmental resources for the benefits of present and future generations. Chapter 2 has identified the sustainable development approach that is adopted in this thesis, i.e. the sustainability limits version, in which development should be within the Earth's carrying capacity. Where there is uncertainty, the precautionary principle is the rule. Chapter 3 has identified the rational planning model, which is simplified to the mixed scanning paradigm, as the preferred land use planning approach.

To adopt the above approaches, Strategic Environmental Assessment [SEA] has been identified as the necessary planning and decision-making tool which is to be integrated into the formulation of PPPs, and in particular, land use planning. This concept has been suggested by many authors, formally proposed in *Our Common Future*, and reiterated in the Rio Earth Summit through Agenda 21.

Keeping the above in mind, this chapter examines the philosophy and principles of EIA [sections 4.2 and 4.3] and identifies its strengths and limitations which led to the need for and development of SEA [section 4.5]. The main objective is to highlight the principles and links between EIA, SEA and land use planning for the purposes of achieving sustainable development. The basic principles of SEA as a planning tool and a decision-making instrument, its characteristics and necessary political-institutional frameworks will justify and form the basis for the proposals for Malaysia.

The evaluation of several current examples of SEA in section 4.6 is to identify significant characteristics in their frameworks and processes, which can be adapted into the Malaysian context. The examination of the development of EIA in the developing countries like Malaysia [section 4.7] is to identify shortcomings and constraints which are expected in the development of SEA.

4.2 ORIGIN AND DEFINITIONS

4.2.1 Origin of EIA

In the late 1960s, there was a great awareness that many industrial and development projects of the 1950s and 1960s were producing unforeseen and undesirable environmental consequences. This environmental awareness was particularly strong in America, in a movement which was attributed to ineffective physical planning and development process of the time. [Burchell and Listokin 1975].

Flaws were discovered in cost-benefit analysis, particularly its inability to place realistic monetary values on environmental intangibles, and in many plan evaluation methods for their unsystematic assessment of environmental impacts. The most significant result of this dissatisfaction was the introduction of EIA in the USA through the National Environmental Policy Act [NEPA] of 1969 [Kozlowski 1990, Clark 1991].

It dawned in the USA that the integration of environmental considerations into the development process can be achieved through proper procedures and processes for environmental consideration. Although in the beginning it was only widely acknowledged as a decision-making instrument, EIA was also later accepted as a planning tool whereby possible impacts of a proposed project on the environment is assessed prior to approval of such projects [Burchell and Listokin 1975]. This concept of a process of environmental consideration in the development process was the main philosophy of NEPA.

The success of the EIA system in the USA was adopted by other countries. However it is noted that the pioneering legislation by the USA has not been a universal model for environmental laws. Instead, each country has enacted laws which best fit into their constitutional, economic, social and technological frameworks, such as in the United Kingdom, Canada and the Netherlands [PADC [ed.] 1983, OECD 1986, Wathern [ed.] 1988, Clark and Herington 1988, Ebisemiju 1991, Therival *et. al.* 1992].

4.2.2 Definitions

Any discussion on EIA [and eventually SEA] will ultimately enter into the process and interrelationship between 'environment', 'effects', 'impacts', 'environmental assessment' [EA], 'environmental impact assessment' [EIA] and 'environmental impact statement' [EIS]. These terms are defined below.

Environment

In the1960s, when environmental movements were very strong, *environment* simply meant *biophysical surroundings*, excluding human beings and their constructed habitat, and this was reflected in most environmental studies, planning and resource management reports. NEPA however widened the term to *human environment* which is interpreted to include:

> "natural environment ... the natural and physical environment and the relationship of people with that environment ..." [BLM's NEPA Handbook 1988].

Since the World Conservation Strategy [IUCN, UNEP and WWF 1980], the term *environment* was further broadened. By the late 1980s *environment* is defined broadly to include *biophysical, socio-economic, spiritual and cultural elements and their interactions*. "Our Common Future" [WCED 1987] popularised the concept of an *internationalized environment* which interprets 'environment' as a *process*:

> "...the environment is looked upon as *process* rather than as form, as the result of a set of relationships between physical space, natural resources and a constantly changing pattern of economic forces. The environment in the international economy is an *internationalized environment* and one which often exists to serve economic and political interests far removed from a specific physical 'location'." [Redclift 1987, p. 79] - italics are for emphasis.

This thesis has adopted the wider definition of environment of the 1980s, and accepts the concept of environment as a process by WCED.

EA, EI Analysis, EIA, EIS

EA, EIA and EIS are sometimes used interchangeably by several authors. Roberts and Roberts [1984] has made clear distinctions between these terms:

> *Environmental assessment* [EA] is the base-line monitoring and compilation of data relating to quantification of the important physical-biological characteristics of an area. In the planning process, EA attempts to understand the interacting elements and processes of the environment including human activities for decision-making purposes.
>
> *Environmental Impact Analysis* [EI Analysis] is the process of identifying and evaluating the effects on the environment of impact factors arising from a change in use. This may include EA, the prediction of changes and an evaluation of the significance of these changes. It does not imply any particular procedure.
>
> *Environmental Impact Assessment* [EIA] is the *specific procedural system* developed under NEPA for relating impact factors of a land use change to the environment.
>
> *Environmental Impact Statement* [EIS] is a documentation of the matters considered under EIA.

The terms EIA and EIS originate from the USA, where EIA is an examination conducted to determine whether or not a project requires an EIS or EA. It is the study of a set of guidelines

established by NEPA to identify actions which require a full environmental study. If the EIA study establishes that the action is not exempted by the guidelines, the full environmental study will proceed, and the findings will be reported in an EIS or EA. In summary, following the USA definitions, EIS or EA represents the fundamental activity, and EIA is an introduction to it [Ahmad 1987]. However even in the USA, the terms are sometimes used differently. The Bureau of Land Management [BLM] of the USA for instance, interprets EA as the document resulting from EIA, as seen from the following extract from BLM's NEPA Handbook:

> "EA is [a] A concise public document for which a Federal agency is responsible that serves to: [1] briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a finding of no significant impact; [2] aid an agency's compliance with the Act when no EIS is necessary; [3] facilitate preparation of a statement when one is necessary. [b] Shall include brief discussions of the need for the proposal, of alternatives as required by section 102(2)CE, of the environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted." [BLM's NEPA Handbook 1988].

The above terms are used differently in many other countries, where *EIA* is defined to include the technical aspects of the environmental study, including data gathering, prediction of impacts, comparison of alternatives and the framing of recommendations. EIA Report [EIS in the USA], refers to the document which summarizes the results of the study, and forwards recommendations to the decision-maker. Therefore generally, outside the USA, EIA is the substantial technical activity, for which *EIA Report* is the necessary reporting device. Other than when making references to the USA, this thesis adopts the international definition of EIA and EIA Report.

Effect and Impact

Effects and *impacts* are also sometimes used interchangeably. *Effects* in this thesis refer to the "physical and natural changes resulting from development" [Catlow and Thirwall 1976]. NEPA has categorized effects into two types:

> "[a] *Direct effects*, which are caused by the action and occur at the same time and place; [b] *Indirect effects*, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects, on air and water and other natural systems, including ecosystems." [BLM's NEPA Handbook 1988].

Impacts are "consequences of effects represented by attributes of the environment on which we can place an objective or subjective value" [Catlow and Thirwall 1976]. In EIA the meaning of *impact* is important for it determines the process and content of the exercise. A functional definition of an impact is "any change in the physical-chemical, biological, cultural, and/or socio-economic environmental system that can be attributed to human activities relative to alternatives under study for meeting a project need" [Canter 1977, p. 173].

Effects and impacts as used in the NEPA 's CEQ regulations are synonymous:

> "effects and impacts are ... ecological [such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems], aesthetics, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect will be beneficial..." [BLM's NEPA Handbook 1988].

Most EIA identify impact groups into natural environment and human environment. Natural environment includes the fauna and flora, insect life and organisms, and ecological regimes in identifiable terrains or aquatic habitats. Human environment includes the aesthetic quality and the physical and natural environment, employment, health, safety and convenience, and social and cultural well-being. These definitions of environment and impacts are important for they determine the scope and processes of EIA under the various legislation [Catlow and Thirlwall 1976].

Lee [1989] provides a more functional definition of environment when he identifies significant environmental impacts in an EIA exercise according to three definitions of environment. These could be both adverse and favourable impacts and may be of many different types, according to the type of environment, as outlined in Table 4.1.

TABLE 4.1: TYPE OF ENVIRONMENTAL IMPACTS ACCORDING TO TYPES OF ENVIRONMENT

[a] *receiving environmental media*
- [i] changes in air quality [e.g. through altering the concentration levels of particular pollutants in the atmosphere];
- [ii] changes in ambient levels of noise and vibrations;
- [iii] changes in water quality e.g. through altering the chemical/biological characteristics of rivers, lakes, estuaries, etc.]; and
- [iv] changes in the quantity of land available for different purposes and in the quality of land [e.g. through changes in the quality of landscape, the propensity to soil erosion, the levels of chemical residues in the soil].

[b] *living receptors*
- [i] changes in the level of human mortality and morbidity [i.e. human health effects], changes in the amenity value of the environment for leisure and recreational use [this overlaps other categories of environmental impact, such as water, land and air quality changes]; and
- [ii] changes in damage levels to fauna and flora and natural ecosystems with consequential effects on species diversity and abundance, and on agriculture and forestry.

[c] *built environment*
- [i] changes in damage levels to individual buildings and groups of buildings; and
- [ii] changes in the aesthetic appearance of individual buildings and in the quality of the built environment.

Source: Lee 1989.

Environmental impacts are measured in terms of changes in attributes or elements, and their relationships. These attributes are "variables that represent characteristics of the environment... and changes in environmental attributes provide indicators of changes in the environment." [Jain *et. al.* 1981, p. 37]. An example of a list of environmental attributes which are used to measure environmental impacts are given by Jain *et. al.* [1981], as outlined in Table 4.2.

Jain's list of environmental attributes is more inclined towards the natural environment. Munn [1975] identifies environmental impacts according to areas of human concerns. Although the identification was made much earlier, this could be the answer to the concern made later towards EIA in many developing countries, which consider EIA as "anti-development" [Ahmad 1987]. The impact categories by Munn [1975] is listed in Table 4.3.

TABLE 4.2: ENVIRONMENTAL ATTRIBUTES [GENERAL LISTING] TO MEASURE ENVIRONMENTAL IMPACTS

Air
1. Diffusion factor
2. Particulates
3. Sulphur oxides
4. Hydrocarbons
5. Nitrogen oxide
6. Carbon monoxide
7. Photochemical oxidants
8. Hazardous toxicants
9. Odours

Water
10. Aquifer safe yield
11. Flow variations
12. Oil
13. Radioactivity
14. Suspended solids
15. Thermal pollution
16. Acid and alkali
17. Biochemical oxygen demand [BOD]
18. Dissolved oxygen [DO]
19. Dissolved solids
20. Nutrients
21. Toxic compounds
22. Aquatic life
23. Fecal coliforms

Land
24. Soil stability
25. Natural hazard
26. Land use patterns

Ecology
27. Large animals [wild and domestic]
28. Predatory birds
29. Small game
30. Fish, shell fish and water fowl
31. Field crops
32. Threatened species
33. Natural land region
34. Aquatic plants

Sound
35. Physiological effects
36. Psychological effects
37. Communication effects
38. Performance effects
39. Social behaviour effects

Human Aspects
40. Life styles
41. Psychological needs
42. Physiological systems
43. Community needs

Economics
44. Regional economic stability
45. Public sector review
46. Per capita consumption

Resources
47. Fuel resources
48. Nonfuel resources
49. Aesthetics

Source: Jain *et. al.* 1981.

TABLE 4.3: IMPACT CATEGORIES IN TERMS OF AREAS OF HUMAN CONCERNS

1. *Economic and occupational status*: displacement of population; relocation or population in response to employment opportunities; services and distribution pattern; property values.

2. *Social pattern or life style*: resettlement; rural depopulation; change in population density; food; housing; material goods; nomadic or settled agriculture; rural; urban.

3. *Social amenities and relationship*: family life styles; schools; transportation; community feelings; participation vs. alienation; local and national pride vs. regret; stability; disruptions; language; hospitals; clubs; recreation; neighbourliness.

4. *Psychological features*: involvement; expectations; stress; frustrations; commitment; challenges; work satisfaction; national or community pride; freedom of choice; stability and continuity; self-expression; company or solitude; mobility.

5. *Physical amenities [intellectual, cultural, aesthetic and sensual]*: National parks; wildlife; art galleries and museums; concert halls; historic and archaeological monuments; beauty of landscape; wilderness; quiet; clean air and water.

6. *Health*: changes in health; medical services; medical standards.

7. *Personal security*: freedom from molestation; freedom from natural disasters;

8. *Religion and traditional belief*: symbols; taboos; beliefs.

9. *Technology:* security; hazards; safety measures; benefits; emission of wastes; congestion; density.

10. *Cultural*: leisure; fashion and clothing changes; new values; heritage; traditional and religious rites.

11. *Political*: authority; level and degree of involvement; priorities; structure of decision-making; responsibility and responsiveness; resource allocation; local and minority interest; defence needs; contributing or limiting factors; tolerances.

12. *Legal*: restructuring of administrative management; changes in taxes; public policy.

13. *Aesthetics*: visual physical changes; moral conduct. sentimental values.

14. *Statutory acts and laws*: air and water quality standards; safety standards; national building acts; noise abatement by-laws.

Source: Munn 1975.

In many EIA studies, there has been greater focus on adverse impacts and their remedial measures rather than a balance analysis between adverse impacts and benefits. This has been so, to the extent that the term *impact* is usually understood as *adverse impact*. This has led to questions of fairness [related to equity in sustainable development] between the improvement of poverty and backwardness on the one hand and the protection of the environment on the other, particularly in the developing countries [Thanh 1992]. This debate will be addressed later.

4.3 PHILOSOPHY AND PRINCIPLES

4.3.1 NEPA philosophy

NEPA of 1969, with its purpose of establishing "a national policy for the protection and enhancement of the environment" [BLM's NEPA Handbook 1988], mirrors the then-to-be-signed 'Declaration of the United Nations on the Human Environment' in 1972 at Stockholm. The purpose of NEPA is:

> "to declare a national policy which will encourage productive and enjoyable *harmony between man and his environment*; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality." [NEPA 1969 Section 2] - italics are for emphasis.

NEPA is also farsighted to include a concept which already formed an agenda in international debates at the time, but only to be officially adopted as 'sustainable development' ten years later in the World Conservation Strategy [IUCN 1980]. NEPA includes in its declaration of the policy, an aim which mirrors the definition of sustainable development which was popularised by "Our Common Future" [WCED 1987], that is to cater for the needs of future generations. Section 101 [a] states that NEPA is to:

> "... create and maintain conditions under which *man and nature can exist in productive harmony*, and *fulfil the social, economic, and other requirements of present and future generations of Americans*." [Section 101. (a) of NEPA of 1969] - italics are for emphasis.

EIA in NEPA

NEPA requires an analysis of the environmental impacts of *major federal actions significantly affecting the environment, in the form of an EIS* :

> "[C] include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on -
> [i] the *environmental impact* of the proposed action,
> [ii] any *adverse environmental effects which cannot be avoided* should the proposal be implemented,
> [iii] *alternatives* to the proposed action,
> [iv] the *relationship* between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
> [v] any *irreversible and irretrievable commitments of resources* which would be involved in the proposed action should it be implemented." [NEPA 1969 Section 102] - italics are for emphasis.

Federal actions as stated by NEPA is interpreted to include:

[1] Adoption of official policy, such as rules, regulations and interpretation;
[2] Adoption of formal plans, such as official documents which guide or prescribe alternative uses of federal resources;

[3] Adoption of programmes, such as a group of concerted actions to implement a specific policy or plan; and
[4] Approval of specific projects such as construction or management activities located in a defined geographic area [BLM's NEPA Handbook 1988].

NEPA's requirements therefore are meant to cover the formulation and adoption of PPPs and projects, so long as they are initiated as Federal actions, which in NEPA, are interpreted to include connected actions, cumulative actions and similar actions. The scope of these actions are interpreted by the Bureau of Land Management as follows:

1. *Connected actions* which should be included in the same impact statement. Actions are connected if they automatically trigger other actions which may require EIS; cannot or will not proceed unless other actions are taken previously or simultaneously; and are interdependent parts of a larger action and depend on the larger action for their justification.
2. *Cumulative actions* which when viewed with other proposed actions have cumulatively significant impacts and should therefore be discussed in the same impact statement.
3. *Similar actions* which when viewed with other reasonable foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing. [BLM's NEPA Handbook 1988] - italics are for emphasis.

Although otherwise stated by NEPA, EIA in the USA was generally enforced for federal *projects*. However by 1981, several federal agencies issued guidelines for EIS for PPPs. The USA Department of Housing and Urban Development [USA.HUD] in 1981 issued a most comprehensive guideline for the preparation of areawide EIS for metropolitan-scale proposals, thus reaffirming that EIA was and is also meant for proposals other than development projects. This was followed by other agencies which are *encouraged* to prepare broad EIS that cover policies or programmes, and to "use a form of tiering when addressing subsequent projects within the policy or programme ... EIA is also integrated into the legislative process of Congress." [Therivel *et. al.* 1992, p.44].

The concept of "tiering" is applied in assessing general matters in broader EIS [such as national programmes or policy statements] with subsequent narrower statements or environmental analysis [such as regional or basinwide programme statements or ultimately site-specific statements]. The USA Bureau of Land Management provides the framework for tiering:

> "Tiering is appropriate when the sequence of statements or analyses is: [a] from a program, plan or policy EIS to a program, plan or policy statement or analysis of lesser scope or to a site-specific statement or analysis; [b] from an EIS on a specific action at an early stage [such as need and site selection] or a subsequent statement or analysis at a later stage [such as environmental mitigation]. Tiering in such cases is appropriate when it helps the lead agency to focus on the issues which are ripe for decision and exclude from consideration issues already decided or not yet ripe." [BLM's NEPA Handbook 1988].

State-wide NEPAs, or mini-NEPAS as they are sometimes called, and environmental legislation and regulation were also introduced to enforce EIA for state projects which include major and minor actions. *Major actions* are the cumulative impacts of a proposed action, while *minor actions* are those actions with specific situations such as:

[1] part of a programme or composite development where cumulative impacts would be substantial;

[2] precedent for subsequent larger developments;

[3] allocation of resources; and

[4] input to a subsequent project likely to be of significant because the prior commitment of resources to the proposal might prejudice assessment of the subsequent project [Clark *et. al.*1978].

Cumulative impacts are defined as:

> "Cumulative impacts are... the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency [Federal or non -Federal] or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." [BLM's NEPA Handbook 1988].

To term whether or not an action significantly affects the environment depends on the locality of the proposals because a particular impact may not be significant in one area whilst elsewhere it might be. Nevertheless, impacts are considered as adverse if the action [1] degrades the quality of the environment; [2] curtails the range of beneficial uses of the environment; and [3] inhibits long term environmental goals through the realisation of short term objectives [Clark *et. al.* 1978]. Their significance is measured in terms of context and intensity. Context refers to the society as a whole [human, national], interest and locality. Intensity refers to the degree of the effects on public health and safety, unique characteristics of the geographic area, uncertain or unknown risks, scientific, cultural or historical resources, or whether the action violates any law for the protection of the environment [BLM's NEPA Handbook 1988].

4.3.2 Basic principles of EIA

There exists at present no uniform clear, concise definition of EIA. The varying definitions listed below reflect its growing, changing concept, and hence its wide scope for application. The italics in the following definitions are for emphasis:

- "... assessment consists in establishing *quantitative values* for selected parameters which indicate the quality of the environment before, during and after the action." [Heer and Hagerty 1977];

- "... an assessment of all relevant environmental and resulting social effects which would *result from a project.*" [Battelle Institute 1978];

- "... to identify, predict and to describe in appropriate forms the *pros and cons* [penalties and benefits] of a proposed development. To be useful, the assessment needs to be *communicated in terms understandable by the community and decision-makers* and the pros and cons should be identified as the basis of criteria relevant to the countries affected." [UNDP 1978];

- "...an examination, analysis and assessment of *planned activities* with a view to *ensuring environmentally sound and sustainable development.*" [UNEP 1987];

- "... an activity designed to identify and predict the *impact on the bio-geophysical environment and on man's health and well-being of legislative proposals, policies, programmes, projects and operational procedures*, and to interpret and communicate information about the impacts." [Munn 1979];

- "...a *process* designed to ensure that *potentially significant* environmental impacts are satisfactorily assessed and taken into account in *planning, design, authorisation and implementation of all relevant types of action.*" [Lee 1989, p. 3];

- "... *a procedure* for encouraging decision-makers to take account of the possible effects of development investments on environmental quality and natural resources productivity and a *tool* for collecting and assembling the data planners need *to make development projects more sustainable and environmentally sound.* EIA is usually applied in support of policies for a more *rational and*

  sustainable use of resources in achieving economic development." [Clark 1989]; and

- "... *formally prescribed systematic public processes for assessing ecological and social impacts of possible public decisions*. By public processes is meant processes subject to public scrutiny, through lists of screening decisions and public availability of initial assessment reports, and public input such as through hearings, panels and consultations." [Boothroyd 1991].

The significant terms in the above definitions are listed below. They reflect EIA's flexibility and hence its wide scope for application. More references will be made to these terms throughout the thesis.

a process;
a procedure;
formally prescribed systematic public procedures for assessing ecological and social impacts of possible public decisions.
impact on the well-being;
quantitative values;
pros and cons of a proposed development;
planned activities;
result from a project;
of legislative proposals, policies, programmes, projects and operational procedures;
in planning, design, authorisation and implementation of all relevant types of actions;
rational and sustainable use of resources;
to make development projects more sustainable and environmentally sound;
ensuring environmentally sound and sustainable development;
communicated in terms understandable by the community and decision-makers;

Although differing in emphasis and scope, the definitions reflect a consensus on several basic tenets of EIA, which touches on environmental quality, and the impacts of legislative proposals, policies, programmes, projects and operational procedures on the bio-geophysical environment and on man's health, and a relationship between the public and decision-makers. Basically EIA is a process which identifies 'potentially significant impacts' and proposes mitigation measures, and presents them to decision-makers for a decision on the course of action to be taken on a proposal. *The crucial step in the process is the determination of significant impacts, because of the judgemental value that has to be placed on them.* In a sense the determination can only be made in the decision-making context - whether there is an impact on environmental quality; conflict with objectives, policies and plans; conflict with environmental control authority's objectives, policies or plans; and whether the proposal is an issue of concern to interest groups or local community [Lee 1989].

EIA therefore can be considered as a technique for managing growth, since its main objective is to provide decision-makers with an account of the implications of a proposed course of action before a decision is made [Burchell and Listokin 1975, Clark 1991]. Below is a summary of the basic tenets of EIA [Burchell *et. al.* 1975, Ahmad and Sammy 1985, UNCRD, UNEP 1987, Lee 1989]:

[a] *EIA is a study of the impacts of a proposed action on the environment.* "Environment" includes all aspects of the natural and human environment. Therefore EIA may include studies on the weather, flora and fauna, soil erosion, human health, urban migration, or employment, i.e. all physical, biological, social, economic and other impacts.

[b] *EIA seeks to compare the various alternatives of a proposal.* It determines which alternative represents an optimum mix of environmental and economic costs and benefits;

[c] *EIA is based on predictions.* The technical work involved is estimating the changes in environmental quality which may be expected as a result of the proposed action;

[d] *EIA attempts to weigh environmental effects on a common basis with economic costs and benefits in the overall evaluation.* If this is done, the decision-maker is less likely to overlook an environmental consequence in arriving at his decision;

[e] *EIA is a decision-making tool to aid judgemental decision-making.* The decision-maker is given a clear picture of the alternatives which were considered, the environmental changes which were predicted, and the trade-offs of advantages and disadvantages for each alternative; and

[f] *EIA helps the policy-maker, planner and developer to build an economically and environmentally sound proposal* and provides approving authorities and decision-makers with data for making well-informed decisions.

In summary, EIA has two principal functions:

[1] As a *decision-making tool* to decide upon the acceptability of a proposal based on its environmental costs; and

[2] As a *planning instrument* to minimize adverse impacts caused by a proposal if it is implemented.

Werner [1992] argues that if function [2] is also attached to EIA, then EIA process should be concerned with environmental management, *not* environmental evaluation i.e. impact identification, impact assessment, etc. have to serve the purpose of environmental management, beside the decision for approval of the proposal. This argument supports the thesis that EIA should be applied to PPPs, which are all related to and are part of environmental management. This will be discussed further in section 4.6.

4.4 EIA PROCESS

4.4.1 Theoretical basis

NEPA of 1969 directs Federal agencies to use a systematic interdisciplinary approach, which ensures the integrated use of natural and social sciences and the design arts, in planning and decision-making on the human environment [NEPA Handbook 1988].

EIA is clearly a multidisciplinary subject matter, and therefore there explains the lack of theoretical integration in its fields which include business management, administration, politics and jurisprudence, each with its own goal orientations, jargon, normative constraints and values [Ashby 1976, DiSanto *et. al.* 1986, Wathern 1988]. In fact Ashby [1976] points that it may be wise to remain sceptical about the efficacy of EIA because of this lack of theoretical basis. There is also an atheoretical use of methodologies; most EIA rely on intuition, trial and error in disciplines which include ecology, biology, physics, biochemistry, agronomy, archeology, anthropology, sociology, geography, economics, political science, land use planning, climatology and medicine [DiSanto 1986].

To add to its complexity EIA is not a purely technical exercise. Value judgments are made throughout the process. Politics, as well as science, is part of EIA [Bisset 1983, Clark 1983, Hyman et. al. 1988].

4.4.2 EIA process

While EIA was introduced as a tool to assess impacts of development proposals and subsequently to assist in the related planning and decision-making process, it is not, in itself, a method of generating such proposals. As a concept it is a *systematic cyclical process* for

analysing and evaluating a proposal or project presented to it [Kozlowski 1990]. EIA definitions made earlier, particularly by Lee [1989], Clark [1989] and Boothroyd [1991], identify the systematic cyclical process of assessment which starts from the initiation of the proposal, through the planning and evaluation of alternatives, consideration of significant impacts in the decision-making process, to the implementation and monitoring of the action.

The EIA process described below is for a conventional EIA but could be applied to most types of proposals, with modifications. Fig. 4.1 illustrates the iterative cyclical process of EIA which covers six phases of screening, scoping, impact assessment, scrutiny of findings, decision on proposal, implementation and monitoring. The phases are briefly described below.

Phase 0 - Screening

Screening is a process of determining whether or not a proposal need to be subjected to EIA. Normally the determination is made by examining the description of the proposal against a set of guidelines which is especially prepared for this, either through legislation or administratively.

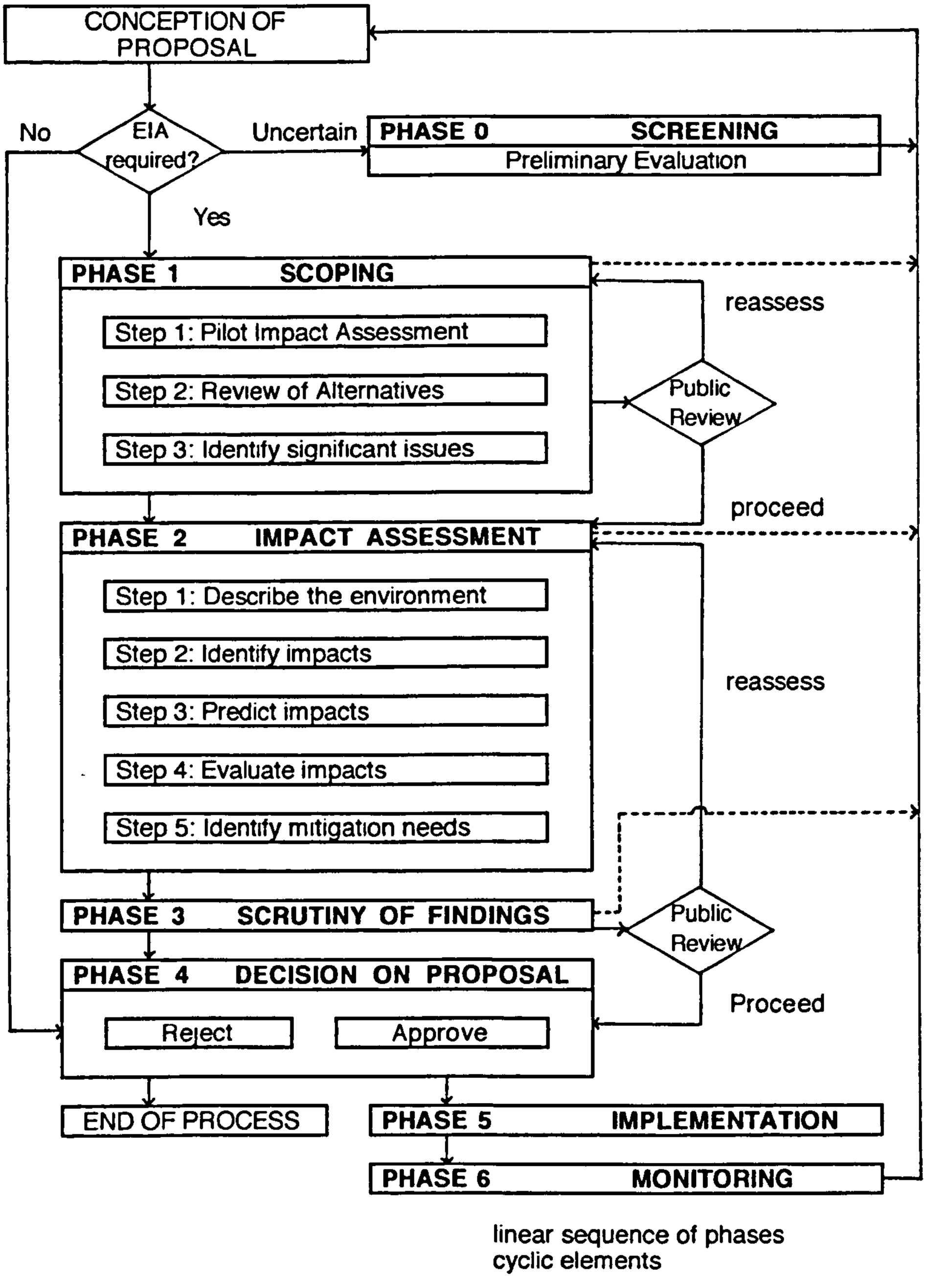
Phase 1 - Scoping

The concept of scoping was introduced as a means of controlling the extent, and hence the cost of EIA, by focusing on significant impacts only [Ahmad 1985]. Thus scoping identifies impacts which are potentially significant, non-significant and those where the significance/non-significance has not yet been established, and attributes of components of the environment for which there is public [including professional] concern and upon which the EIA should be focussed. The categorization is made following four criteria: magnitude, extent, significance and special sensitivity of impacts. Scoping as a procedure is not confined to this phase alone. It is also applied in the process of choosing between alternatives, modifying the proposal's specifications, preparing the EIA study for the preferred alternative, and evaluating the EIA study during the consultation and review stages of the EIA process [Beanlands 1983, Ahmad 1985, Lee 1989].

Phase 2 - Impact assessment

Step 1 is also known as the baseline study, which is simply an analysis of the existing environment. The baseline study is based on the short-list of impacts from the scoping exercise. Normally this is the stage where technical specialists make their major inputs in EIA [Ahmad 1985]. Two major types of data input are related to [1] those characteristics of the proposed action which may give rise to significant impacts; and [2] those features of the environment which may be significantly changed by the implementation of the proposal [Lee 1989]. The information is based on secondary sources, field surveys, interviews, or in some cases, through experiments to determine potential impacts.

FIG. 4.1: GENERAL PROCESS OF EIA



Sources: Adapted from Lee [1989] and Kozlowski [1990].

Usually impacts are evaluated after they have been quantified. Wherever it is impossible to quantify, they are evaluated qualitatively. Although it is seldom possible to eliminate an adverse impact altogether, it is often feasible to reduce its intensity through mitigation measures. Normally the mitigation measures are developed by the same personnel who evaluate impacts.

Phase 3 - Scrutiny of findings

This is the phase where the technical information gathered in phase 2 is put together to analyse and compare alternatives. Environmental losses and gains will be combined with economic costs and benefits to produce a full picture of each alternative. Economic costs and benefits may be developed as part of EIA or taken from a parallel economic analysis. The intended output is a series of recommendations from which the decision-maker will choose the course of action [Lee 1989].

Phase 4 - Decision

The *decision-making process* may involve EIA managers and planners, and the technical specialists who are involved in phases 1 and 2. However the *decision on the course of action* is made by and is the responsibility of decision-makers who could be government officials, managers, or board of directors [Lee 1989]. Recommendations made by technical specialists in the assessment phase will be scrutinised against economic and environmental information, together with political realities which are based on public views on the findings of the assessment. The decision could be either to reject the proposal, after which the process ends, or to approve one of the courses of action for implementation.

Phases 5&6 - Implementation & Monitoring

During the implementation of the proposal, monitoring of the impacts will contribute towards *post-auditing* which is a comparison of actual impacts with predicted impacts. One of the aims is to determine how close those predictions were to reality. Because of the duration of post-auditing activity, it is not usually conducted by the same team which has conducted the EIA. This is best conducted by a team which is formed as a part of a programme of environmental monitoring. Other roles of post-auditing include compliance monitoring by competent authorities, internal environmental auditing by developers, and as a general means of evaluating EIA practice and stimulating desirable improvements in future practice. Tomlinson [1989] suggests six types of environmental audits that can be carried out:

- *Decision point audit* : to determine the effectiveness of the EIA as a decision-making tool;
- *Implementation audit* : to ensure that commitments and consent conditions are met and as such essentially "police" projects;
- *Performance audit* : a management audit to examine the response of personnel concerned with project management;
- *Project impact audit* : to identify environmental change arising from a project and is, therefore, a valuable learning tool;
- *Predictive technique audit* : to explicitly assess the accuracy and utility of predictive techniques by a comparison of actual with predicted environmental effects; and

- *EIA procedure audit* : a macro level study of the performance of EIA procedures.

Public review

Formal input by the public is given in two phases i.e. in the scoping phase, when public participation is regarded as a data input, and in the scrutiny of findings phase, when public participation is regarded as an injection of values set by the public on their environment. Ideally public participation is mandatory, although this is not the case in many countries. There are several views on the principles and extent of public participation in the EIA exercise. This is discussed further in sections 4.5.5 and 4.5.7.

4.4.3 EIA methods

EIA *methods* are "means for classifying and presenting material for impact analysis or for aiding the presentation of results...information is collected, evaluated and displayed" [Werner and Bromley 1974, quoted by Clark *et. al.* 1978]. This is different from EIA *techniques* which are "standardised means for describing and/or measuring attributes of the environment and for measuring and predicting changes in these attributes arising from introduced external factors" [Clark *et. al.* 1978]. It is to be noted also that methods are concerned with the technical contents of the EIS/EIA Report and should not be confused with guidelines which aim at improving EIA procedures.

The purpose of EIA methods are [1] to ensure that all environmental factors that need to be assessed are included in the analysis; [2] to provide a means for evaluation of alternatives on a common basis; [3] to provide an aid in identifying data needs and planning special studies or field studies; [4] to provide a basis for evaluation of mitigation measures; [5] to provide information in summary form for public participation; and [6] to ensure compliance with the spirit and intent of NEPA [Canter 1977].

There are a huge variety of "formal traditional EIA methods" available, such as matrices, scaling-weighting and checklists. However the most common method is the "ad hoc" method, mainly because many EIA systems do not make it mandatory to evaluate alternatives. In the UK for instance, in an unpublished [at the time] research quoted by Bisset [1991], out of 300 EIA reports, very few were prepared with the assistance of a formal EIA method, while in the Netherlands only 5% were prepared with the assistance of a method for "weighting" impacts. However the situation has changed in the Netherlands where the procedures have given importance to alternatives, even before the the EC Directive for the whole of the member countries to consider alternatives.

The introduction of EIA and its methods were in part due to the perceived "failure" of "traditional" cost-benefit analysis [CBA] to evaluate environmental costs and benefits.

However today the trend seems to be on the reverse as there is a renewed interest in evaluating environmental impacts in money terms to provide "simple" common measurement unit. This has been an important focus of attention by the Asian Development Bank [a pioneer in this work], the World Bank and some national government departments [the Scottish Office has published a report on this] [Bisset 1991].

Many works have been written on EIA methods, for example by Canter [1977], Clark *et. al.* [1978], Lee and Wood [1980], Environmental Resources Ltd. [1981], Lee [1989], VHB Research [1990],Thompson [1990] and Bisset [1991], just to name a few. These methods mostly address impact identification and, to a lesser extent, evaluation tasks. As such they are not comprehensive, and neither are they identified for specific tasks only. Furthermore they are not "original" to EIA but already existed before EIA. "What is unique to EIA is not the characteristics of the individual constituent methods which are used but the ways in which they are combined in an overall assessment strategy" [Lee 1989, p.27]. This is because alternative assessment methods frequently exist for any given task. Choosing the right method for each task is the main ingredient in a good EIA.

Table 4.4 shows examples of methods that can be assigned to specific tasks, in an EIA of a development project. The five tasks are [1] description of the proposed development; [2] description of the existing and projected environmental conditions; [3] assessment of probable impact of development; [4] assessment of compliance with environmental plans, policies and controls; and [6] preparation of non-technical summary of the assessment.

A difficult process here is the identification of the relationship between social, economic and technical actions, and their direct and indirect impacts on the environment. The identification of the response of social systems to these impacts is another difficult process. There are limited short or middle-range predictive forecasting techniques with scientific justification i.e. with an explicit demonstration of the premises and the methods and probability of occuring [Burkhadt and Ittelson 1978].

TABLE 4.4 : EXAMPLES OF EIA METHODS FOR SOME EIA TASKS

Tasks	Methods [examples only]
1. Description of proposed development	
[a]Identify aspects of project for which information is to be sought distinguishing, where necessary, between different stages in the proposed development [e.g. construction and operating phases] and between different levels of screening.	Checklists, consultation with developer.
[b]Determine resources to be used in construction and initial operating phase, wastes to be created, physical form of the development.	Data sheets, engineering drawings, etc. prepared by developer; mass balance analysis; accident and uncertainty analysis [this continues through a number of assessment stages].
[c]Forecast future resource use, waste generation, etc. over the expected life of the development.	The same methods apply as in [b], but methods of production and technological forecasting are also relevant.
2. Description of existing and projected environmental conditions	
[a]Identify aspects of existing and projected environmental conditions for which information is to be sought.	Checklists, consultations with environmental agencies; alternatively, may be linked with 1[a] through the use of matrices or through more elaborate representations of relationships such as networks.
[b]Collate existing environmental data and identify gaps in information.	Consultation with environmental agencies and voluntary organizations; use of data bank and retrieval systems.
[c]Obtain additional environmental data to meet remaining deficiencies.	Review of existing monitoring systems; special surveys using a variety of techniques [aerial photography, field sampling, etc.]
[d]Predict future environmental conditions [without the proposed development].	Variety of available methods, ranging from simple forms of extrapolation to complex modelling studies; consultation to complex modelling studies; consultation with environmental agencies.
[e]Summary and presentation of data.	Mapping, overlay methods, summary sheets.
3. Assessment of probable impact of development.	
[a]Assess magnitude of impact [in present and future conditions] on;	
• air, water and land.	Diffusion and resource utilization models, physical intrusion assessment;
• receptors within the environment	Ecologically modelling, damage functions.
[b]Assess importance of impact by:	
• investigating response of affected parties;	Social surveys, agency consultation and public participation;
• aggregating individual impacts	Scaling and weighting system, overlay methods, use of panel of experts.
4. Compliance with other environmental plans, policies and controls	
Assess likely compliance of development with existing and proposed controls.	Agency consultation, checking of extant plans.
5. Review of alternatives to the proposed development	
[a]Identify alternatives to be considered.	Checklist [of types of alternatives to be reviewed], consultation and survey methods.
[b]Describe project alternatives and assess their impacts.	Same methods as in 1, 2, 3 above, combined with screening methods.
6. Preparation of non-technical summary of the assessment	
Determine salient features of assessment and most effective means of presentation.	Communication methods.

Source: Lee 1989.

4.5 EIA AND SUSTAINABLE DEVELOPMENT

4.5.1 Before and after NEPA

Sadler [1988] traces the trend in environmental assessment techniques and procedures, and their role and scope, in Canada and suggests that the same trend also applies to the international scene [Table 4.5]. Prior to EIA in 1970, environmental assessments were merely analytical techniques which were largely confined to economic and engineering feasibility studies. The public had very little say in the process. At the same time that EIA was enforced in the USA, these techniques were improved to include multiple-objective benefit-cost analysis. However environmental and social consequences were not formally incorporated.

TABLE 4.5: CANADIAN AND INTERNATIONAL TRENDS IN ENVIRONMENTAL ASSESSMENT TECHNIQUES AND PROCEDURES

Time Period	Innovations in Technique and Procedure
Pre - 1970	*Analytical techniques* largely confined to *economic and engineering feasibility studies:* narrow emphasis on efficiency criteria and safety of life and property: no real opportunity for public review.
c. 1970	*Multiple-objective benefit-cost analysis:* emphasis on systematic accounting of gains and losses and their distribution reinforced through planning, programming and budgeting review; environmental and social consequences not formally incorporated.
c. 1970 - 1975	*Environmental Impact Assessment [EIA];* primarily focussed on description and 'prediction' of ecological/land use change; formal opportunities for public scrutiny and review established; emphasis on accountability and control of *project design and mitigation.*
c. 1975 - 1980	Multi-dimensional environmental assessment [EA] incorporating *Social Impact assessment [SIA]* of changes in community infrastructure, services and lifestyle; public participation becomes an integral part of *project planning;* increasing emphasis on project justification in review process; *risk analysis* of hazardous facilities and unproven technology in frontier areas.
c. 1980 - 1986	Attention given to establishing better *linkages between impact assessment and policy-planning and implementation - management phases;* research focus on effects monitoring; post-project audit and process evaluation; search begins for more disciplined scoping and focussing procedures and less protracted forms of consultation based on negotiation and mediation.
c. 1986 - present	*Scientific and institutional framework* for environmental impact assessment, *planning and management* being re-thought and restructured in response to report of the Brundtland Commission and the Canadian National Task Force on Environment and Economy; *cumulative impacts* of industrial and *resource development* on the global biosphere and regional ecosystems are new imperatives for policy reform and process adaptation; international aid agencies incorporate EIA procedures into development planning and project appraisal.

Source: Sadler [1988].

In the first five years after NEPA, EIA focussed on description and prediction of ecological/land use changes. The emphasis was only on accountability and control of project

design and mitigation. However for the first time there were formal opportunities for public participation. In the second five years, EIA advanced to be multi-dimensional and incorporated social impacts. Social Impact Assessment [SIA] was formally developed, and public participation became an integral part of project planning. Risk analysis of hazardous facilities and unproven technology became a prerequisite.

Coinciding with the World Conservation Strategy of 1980, the five year period after that saw better linkages between impact assessment and policy-planning and implementation-management phases. More research were carried out to improve monitoring, post-project auditing and process evaluation. To reduce delays and resources, attempts were made to find a more disciplined scoping procedure; and to reduce the time in coming to terms with the wishes of the public, negotiation and mediation was formally introduced into the public participation process.

Today, since "Our Common Future" [WCED 1987] more attempts are being made to integrate environmental assessments into the planning and management process towards the achievement of sustainable development. Policy reforms include the consideration of cumulative impacts of industrial and resource developments. In the attempt to further instil EIA in the policy and political frameworks of developing countries, international aid agencies have incorporated EIA procedures into development planning and project appraisal.

4.5.2 Evolution from EIA

EIA has been acknowledged to be effective for decision-making not only for development projects, but also for the adoption of policies, programmes and plans, including spatial/land use plans. Just to list a few, the following represents some of the off-shoots from the conventional EIA:

Adaptive Environmental Assessment and Management [Adaptive EAM]
Area-wide EIS
Cumulative Impact Assessment [CIA]
Health Environmental Impact Analysis [HEIA]
Impact Zoning [IZ]
Integrated Management [IM]
Policy Appraisal [PA]
Programmatic Environmental Impact Statement [PEIS]
Risk Analysis [RA]
Social Impact Assessment [SIA]
Sound Impact Analysis [SIA]
Strategic Environmental Assessment [SEA]
Ultimate Environmental Threshold [UET]
Urban Policy Impact [UPI]
Visual Impact Analysis [VIA]

The development of the above off-shoots from EIA took place over twenty years since it was first legislated under NEPA. It is noted that some of the developments are particularly directed

toward the assessment of PPPs. Brief descriptions of some of these approaches are made in section 4.6.

4.5.3 Limitations in EIA as a tool for sustainable development.

Eight limitations have been identified in the conventional EIA process as a tool for sustainable development. They are:

[1] EIA is generally reactive in nature;
[2] EIA generally overlooks impacts from ancillary developments;
[3] EIA generally overlooks cumulative environmental effects and impacts;
[4] EIA generally forecloses alternatives;
[5] EIA generally does not look at objectives;
[6] EIA is almost invariably carried out too late and ends too soon;
[7] EIA generally tends to look at only a narrow spectrum of the issues that need assessing; and
[8] EIA outcomes are sometimes inconsistent with the perceptions.

The limitations are briefly discussed below:

[1] The 'reactive' nature of EIA

Because of its general project-orientation, EIA tends to be reactive in nature, in contrast to the need for a more 'pro-active' approach to environmental management, in which values held with respect to the environment play a more formative role in PPPs. This is against the principle of planning for sustainable development which should be comprehensive and integrated, and far-sighted into the medium- and long-term future and prospects for the coming generations. The reactive approach is also against the principle of rational planning for optimum use of resources.

[2] Overlooks impacts from ancillary developments

Because of its project-orientation, indirect and induced activities tend to be overlooked. The combined impacts of these developments, when put together, may exceed those of the original project. An example is the case where the English Channel Tunnel project is the original project and improvements to the UK rail system and developments of major freight transhipment facilities are the induced activities. Although ancillary developments may be subject to separate project EIA, "sequential, as distinct from simultaneous, assessments tend to reduce the number of alternatives [including the zero option] that can be effectively considered and hamper the evaluation of the cumulative impacts associated with the development as a whole." [Lee and Walsh 1992, p. 129].

[3] Overlook cumulative environmental effects and impacts

EIA has been primarily project-oriented, resulting in a limited view of environmental impacts. Environmental assessments often overlook the potential for combined effects of two or more [independent or related] developments [i.e. cumulative impacts], and the possible indirect or secondary impacts. Minor activities but which collectively have significant impacts are often overlooked. [Sadler 1988, Cocklin 1989, Sadler and Jacobs 1991, Rees 1991, Lee and Walsh 1992].

Many serious regional or global scale environmental problems such as disappearing forests, acid rain damage, the thinning ozone layer, and rising carbon dioxide levels are the cumulative results of an array of expanding economic activities. This means that it is the whole present pattern of growth-driven economic developments, not just some particular project or economic sector that is unsustainable.[Rees 1991]

[4] Foreclosure of alternatives

At the project stage, alternative courses of actions have been eliminated in the earlier stages of planning and decision-making, at which no satisfactory environmental assessment may have taken place. These alternatives could be environmentally better than the selected one, but have been overlooked by the system. Examples are alternative mode of transport of transportation routes, the use of energy and selection of an energy-generating plant.

[5] Generally does not look at objectives

Since EIA is generally used for considering project approval, it is not concerned with the development of objectives of the project. Many project objectives are not based on environmental considerations which is imperative for sustainable development [McNeely 1991]. This sums up that basically EIA is a process of analysis and criticism, rather than a creative process [Holtz 1991]. It does not provide solutions but only sets limitations and requirements on what can be done. In this sense EIA is the antithesis of comprehensive land use control [Burchell *et. al.* 1975].

[6] Almost invariably carried out too late and ends too soon.

A project-related EIA is in most cases not related at all to the regulatory nor planning processes. In most cases, it is carried out after the project has been designed and decided. It is therefore a simplistic approach to complex issues [Burchell 1975]. Wathern *et.al.* [1987] associated it with its failure as a result of the pre-determination of projects by PPPs which either propose these developments, or give them sanctions:

> "A project-based EIA is a simplistic solution to the *problem of integrating environmental considerations into decision-making*. Many of the issues associated with large development proposals are pre-empted by the policies which underlie

them. There are also important implications for policy formulation in the cumulative effects of individual development proposals." [Wathern et. al. 1987]

A more effective EIA should carry on after the project is implemented, i.e. in implementation and auditing [Lee 1989].

[7] Narrow spectrum of issues that need assessing

EIA's general emphasis is on impacts on species, ecosystems, water quality and pollution. For sustainable development, there is also a need to consider impacts on socio-economic factors, particularly those which benefit the local people and contributions of biological diversity to human welfare. There should be 'ethical impact assessments' which take into consideration far larger questions about the values of the society being developed; cultural assessments which examine issues of how the proposed projects will affect the local culture, and others.

Projects have always tended to stress on the economic dimension dealing with the creation of wealth and improved conditions of material life; and a social component measured as well-being in nutrition, health, education and housing. A conventional EIA tends to address only the ecological component that recognizes the primacy of conserving the life-giving natural resources and processes on which all progress depends. This means that two other important components of sustainable development [they actually should be interrelated] are neglected: the political dimension pointing to such values as human rights, political freedom, security, participation, and some form of self-determination; and the cultural dimension in recognition of the fact that cultures confer identity and self-worth to people [McNeely 1991]

[8] Outcomes which are inconsistent with perceptions.

There are observations that outcomes of the EIA process are often inconsistent with the perceptions of some as to what is environmentally acceptable. This view becomes more widespread as environmental disruptions continue to increase worldwide, and as environmental consciousness expands [McNeely 1991, Clark 1991]. "Attempts are now being made to link EIA, CBA and risk assessment to overcome these earlier deficiencies and to achieve new objectives in the context of sustainable development." [Clark 1991]

4.5.4 Role of EIA for sustainable development

The various definitions of sustainable development, the identification of its goals, principles, strategic imperatives and instruments for action in Chapter 2 lead to one conclusion. Sustainable development is *any form of planned change that can be maintained indefinitely.* It is development that attempts to raise the overall quality of life as well as attain and maintain intra-generational and inter-generational equity. At the same time this development should not erode the ecological, social, or political systems upon which it is dependent. This entails

the integration of economic, social and environmental considerations when planning or guiding future developments.

To achieve the above, there must be a 'policing' mechanism to assess whether or not any development proposal, which may be in the form of PPPs or projects, could be termed as contributing towards sustainable development, or on the contrary, what Rees [1991] terms 'unsustainable development'. The philosophy and principles of EIA makes it appropriate for this role. Its integration within the macro-planning process would enhance the protection of the environment and ensure optimisation of resource management. However EIA as generally currently practised needs to be improved in terms of its orientation, scope, content and procedural requirements.

From his comparative analysis of what he calls sustainable development and *un*sustainable development Rees [1991] concludes that if EIA is going to make significant contribution to sustainable development, it should include consideration of the full range of PPPs and other project-related activities. He made one conclusion of the current practice of EIA in Canada, and this can be applied to the international scene as well:

> "The one-shot, prediction-based approach is ecologically naive and wholly inappropriate for the requirements of sustainable development. The current conception is a reactive one in which the economy is considered to be independent or driving variable, and [EIA] is the dependent variable. What is required is a proactive approach in which the requirement of sustainability is the driving consideration and the permissible level of economic activity is the dependent variable." [Rees, p. 132].

4.5.5 EIA framework for sustainable development

Despite shortcomings, experiences show that the EIA process does, to a certain extent, influence project design and policy adaptation. More importantly, it can help to redefine the political culture of decision-making and contribute towards achieving sustainable development. EIA can help to maintain the regional integrity of natural systems while meeting other social and economic imperatives of sustainable development. This is achieved by accommodating improvements which are collectively aimed at accelerating the shift in EIA from the traditional emphasis on impact minimisation of project development to a more strategic approach [Wood 1988b, Herington 1988, Sadler and Armour 1989; Cocklin 1989, Sadler and Jacobs 1991, Gardner 1991, Clark 1991, Rees 1991, Lee and Walsh 1992].

A framework for EIA in the achievement of sustainable development can include the following components:

[1] Move from react and cure to anticipate and prevent;

[2] Make the process more problem-focussed and value-based;

[3] Link policy, planning assessment and management;

[4] Focus on cumulative impacts;

[5] Develop within the regional carrying capacity;

[6] Increase public participation in EIA; and

[7] Improve the contents of EIA

The components of the EIA framework for sustainable development are briefly discussed below:

[1] Move from react and cure to anticipate and prevent

Approaches for sustainable development must be goal-seeking. This means that environmental planning and management approaches must be normative, pro-active and dynamic [Gardner 1991]. The key to a more anticipatory approach to environmental management involves placing EIA within a more integrated system for environmental and economic decision-making [Sadler 1988]. Examples are the promotion of Risk Impact Analysis before introducing new technologies and the notion of sustainable re-development which points to environmental assessment of damaged and degraded ecosystems for purposes of rehabilitation and restoration. The principles of sustainable development will add new components and relationships to impact assessment and the development process.

[2] Make the process more problem-focussed and value-based

Generally conventional project-specific EIA process means that many other development decisions and resources management practices are not assessed for their environmental impacts, even though their collective impacts may be greater than that of individual large-scale and hazardous projects. A classic example is urban development, due to the general perception that human settlements are detached from their resource base and the imperatives of sustainabilities. This conventional approach to EIA does not provide much opportunity for communities to improve their values on development activities since many non-project decisions are made without the benefits of environmental assessments and public participation. Therefore there is a need for a greater diversity in the EIA process, to give greater power and responsibility to communities for assessing, monitoring and controlling development impacts and becoming involved in negotiated settlements of disputes [Sadler 1988].

This issue leads to the need for a focussed approach in data collection and analysis. The best method is an EIA that is efficient in terms of time, money and expertise. Therefore there is a need for an information framework or plan for the collection and analysis of data which is determined by a rational scoping method in the beginning of the process. The adequacy is determined by the ability to determine internal validity and reliability, and avoid systematic bias, informational bias, hypothetical bias and strategic bias. [Hyman *et. al.* 1988].

[3] Link policy, planning, assessment and management

Although the pursuit of sustainable development covers three phases of justification, location and mitigation of proposed activities, project EIA tends to focus largely on mitigation. Since the first two phases are concerned with policy and planning processes, the inclusion of EIA in these two phases as well as the decision-making process, yields a more effective and efficient approach towards sustainable development. This approach leads to more integrated resource planning and programmatic assessment [Munn 1975, Wood 1983, Wathern 1988, Wood and Djeddour 1990, Clark 1991].

As noted earlier, the broad concept of "wealth bequest" in sustainable development needs supplementing with a concern to avoid irreversible losses of environmental assets through developments. Towards this end, a wider concept of EIA is recommended by the Brundtland Report:

> "A broader EIA should be applied not only to products and projects, but also to PPPs, especially major macro economic, finance, and sectoral policies that induce significant impacts on the environment." [WCED 1987, P. 223].

[4] Focus on cumulative impacts

This requires a synoptic ecosystem approach which relates the dynamics of natural variability and the effects of human intervention to key indicators such as biodiversity and productivity [Sadler 1988]. This will overcome the limitations of the project- and site-specific application of EIA. This approach is not confined to the assessment of large projects which stimulate other developments, but also applies to multiple developments within a prescribed geographical area [as in a development plan or land use plan] and for the expansion and modification of activities within a particular sector [for instance through policies, plans or programmes relating to energy, transport, forestry or tourism activities] [Wood 1988b].

Focussing on cumulative impacts also mean that there is a need to assess projects which fall outside project-level EIA procedures, but which can be collectively important from an environmental viewpoint. Examples are small but multiple housing or tourist developments within the same area, and non-project actions such as changes in farming and forest management practices which involve changes in types and levels of use of resources [Lee and Walsh 1992]. Analysis and monitoring of cumulative changes will also lead to the establishment of notional ecological thresholds or carrying capacity.

[5] Develop within regional carrying capacity

Carrying capacity refers to the permissible limits of ecological or social impacts. This means that development and economic activities have spatial limits which are determined by the carrying capacity of each area for a particular species. This also means that the management of cumulative impacts is best facilitated by the adoption of a regional-scale planning framework,

because the regional carrying capacity and the development limits that they determine are best understood at the regional level [Rees 1991].

The carrying capacity of most animal species is defined as the maximum population that can survive indefinitely in a given habitat without permanently impairing the productivity of the ecosystem[s] upon which it is dependent. For human society, regional carrying capacity can be defined as the maximum rate of resource consumption and waste discharge that can be sustained indefinitely in a region without progressively impairing bioproductivity and ecological integrity. The corresponding population depends on standards of living, i.e. mean per capita rates of resource consumption and waste production.

This concept is well suited for sustainable development planning and management, for in ecological terms any level of development or economic activity that does not exceed the carrying capacity of a management region is sustainable. Conversely, development or economic activity that consistently degrades the ecosystems upon which the regional population is dependent is not sustainable in the long run [Rees 1991].

[6] Increase public participation

Public participation could be achieved in two forms; direct participation of the public during the scoping exercise, and participation after the report is completed and made available for public review. There are six objectives of public participation: [i] to inform or educate the public; [ii] to identify problems, needs and values; [iii] to seek approaches to problem solving; [iv] to seek reaction [feedback] to proposed solutions; [v] to evaluate alternatives; and [vi] to resolve conflicts [Ahmad 1985].

Public participation has political and administrative problems, such as the choice of whose values to select; the difficulty to conduct comprehensive, interdisciplinary analysis because of institutional organisations along sectoral lines; and 'collective action' of certain groups could influence decision-making because of claims of 'public interest', while the majority of the public remain unrepresented [Hyman *et. al.* 1988].

For effective public participation, the EIA process should be designed so that the most knowledgeable, affected and concerned publics are given the full opportunity to contribute to the planning and decision-making process. This would promote fair sustainable development, because public, fair, and interactive EIA ensures that all relevant knowledge are brought to bear. Wider debates will also increase public consciousness and public knowledge about decision-making and of the consequences of general development directions that are essential for the society to make current sacrifices necessary in order to achieve sustainable development [Boothroyd 1991].

Hyman *et. al.* [1988] suggest three improvements in the public participation exercise in EIA:

[1] increase the scope and number of publics who directly contribute to decision-making;

[2] input from organized publics should be balanced by the use of some other means for representing the values of unorganized publics, such as the use of advocates or surveys of broader samples; and

[3] assessment methods should display the range of views of various groups, rather than aggregating the information on facts and diverse values into a grand index.

[7] Improve EIA content

To date, EIA has been generally concerned primarily with discrete impacts on local systems. Since the internationalization of the environment by the Brundtland Report [1987] , there have been several suggestions that EIA too should expand its scope to consider and assess global cumulative impacts of the greenhouse effects, acid rain, resource depletion, toxic accumulation, and increased risks of disasters. For example, present airport EIA does not consider consequences of increased oil usage by expanding air transportation, while EIA of major land developments do not assess impacts of migration from the source regions nor impacts of the exploitation of resources on their areas of origin.

This brings in the concept of Fair Sustainable Development [FSD] suggested by Boothroyd [1991] who suggests that "a high leverage approach to ensuring that the right questions are asked in EIA is to insert a clause in all EIA-guiding procedures asking them to address FSD." [Boothroyd 1991, p. 151]. This again raises the issue that EIA should be applied to PPPs, for according to Boothroyd "most dangers to FSD will quite correctly be seen as arising from the cumulative effects of innumerable individual actions promoted and permitted by certain policies, regulations, and managerial decisions." [Boothroyd 1991, p. 152]. FSD may be effectively achieved through proactive planning which integrates into it proactive environmental assessment, because FSD has to be incorporated into the goals of proactive planning. A reactive EIA will not be concerned with goals and therefore not with FSD.

As the practice of including FSD in EIA is not the norm at present, there is still a need for research in this idea.

4.5.6 Decision-making for sustainable development

As emphasised by many authors, the basic aim of EIA is basically to assist in decision-making at all levels of planning and management and controls. It is "to identify the potential environmental impacts of undertaking a development proposal, and to present these impacts

alongside other advantages and disadvantages to the decision-makers." [Kozlowski 1990, p.309].

Decision-making which is related to EIA is concerned with integrating environmental considerations into decision-making for development proposals which are normally associated with the achievements of socio-economic benefits [Wathern 1987]. However it is difficult to integrate EIA into the decision-making structure because of the seemingly emphasis on the physical and natural environments while decision-makers are mainly politicians and bureaucrats. There is a general lack of understanding of the possibilities of planning and scientific matters among decision-makers, much less to put values on and weigh the different environmental costs and benefits which are brought together in any EIA [Turnbull 1983].

The decision-making activity involves a variety of *players* from various groups which include [Munn 1975]:

Decision-maker	• head of state, ministers, elected body, individual;
Assessor	• person or agency or company responsible for the EIA;
Proponent	• project initiator;
Reviewer	• responsible for reviewing the EIA and assuring compliance with published guidelines and regulations;
Other government agencies	• agencies with special interest in the project;
Expert advisers	• persons with specialized knowledge required to evaluate the proposed action;
Public at large	• citizens and press;
Special interest groups	• environmental organizations, labour unions, professional societies, local associations; and
International	• neighbouring countries or intergovernmental bodies.

Having such wide-ranging issues, attributes and players, it follows that the decision-making activity is complex. There must be a link between one's understanding of environmental systems with one's understanding of the institutions that are part of the decision-making process. To be effective, environmental professionals must learn the language of development, and establish a network of contacts and actively promote information exchange [Turnbull 1983]. Adaptive Environmental Assessment and Management, for instance, emphasizes the need to increase the understanding of the environmental system and the involvement of decision-makers throughout the process [Holling 1978], while Millard [1986] sums up the procedures which assist in the problem-solving process of decision-making as:

Mediation, arbitration and negotiation;

Education programme including demonstration exhibits;

Commitments to the local people;

Workshops to consider generic issues for classes of applications; and

Special regional procedures for particular developments.

An example of an existing formal and legal contribution of EIA in decision-making is in the Netherlands. The use of EIA as a decision-making tool was made a legal requirement on September 1987 through the Environmental Protection [General Provisions] Act. Through this provision, EIA is fully incorporated in the formal decision-making process which applies to the activity or plan concerned [Scholten 1992]. However Scholten [1992] has a word of caution about using the Netherlands example for developing countries because:

> "The Netherlands is a highly industrialized country with a well-developed infrastructure. It has an established legal system of decision-making in which EIA has claimed to have a formal part. So, it is obvious that experiences obtained in the Netherlands cannot be transfered without caution to the socio-economic and legal settings in so many developing countries. If this is kept in mind, some of the lessons learned in the Netherlands so far, may be worthwhile observing in developing countries." [Jules 1992, p.163]

Any decision made in the development process will affect the socio-cultural, psychological and political well-being of the population. Therefore it is imperative that decision-making can distinguish facts from value judgements. While facts are objective statements about the existence and timing of impacts on natural systems, value judgements are subjective statements about benefits or disbenefits and how important the impacts are relative to other impacts and objectives. While facts are based on scientific collection and analysis of data, values are influenced by attitudes, preferences and tastes. The problem lies when decision-makers have to decide whose value judgements are selected, or whether they should accept values as they are or try to change them, or accept "expert values" which are based on scientific knowledge, but not necessarily representing values of the affected population. It is for this reason that EIA should separate facts from values as much as possible [Hyman et. al. 1988].

The introduction of EIA into any planning procedure must be with two important provisos: [1] it will be applied at a very early stage before options and alternatives are narrowed; and [2] it will not dominate the planning procedure to the detriment of other planning considerations. Arthur Stern, who reviewed twenty years of federal air pollution control in the USA, says that one of the things which was "wrong" with the legislation and regulations was that "... land use planning has become subsidiary to air pollution control regulations rather than to have air pollution but one of several factors requiring consideration in determining the optimum use of ... land." [Ashby 1976]. The answer to this is the

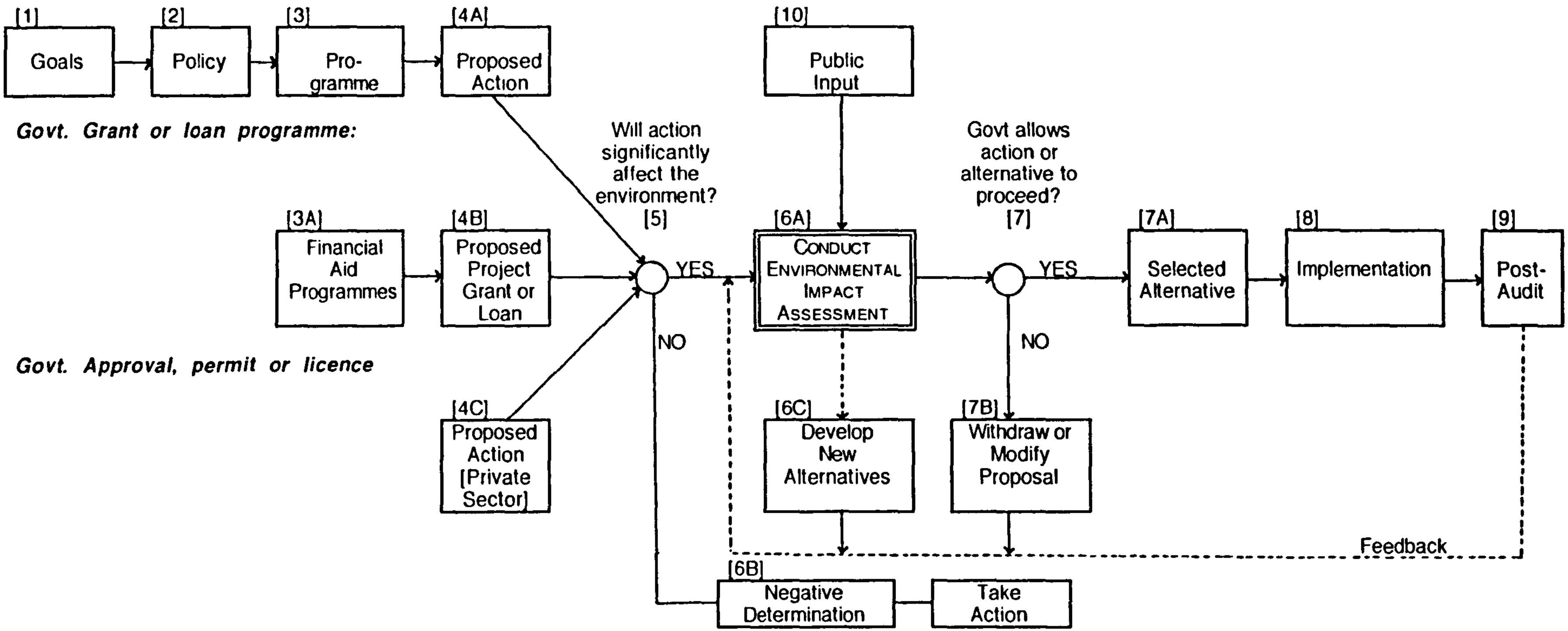
establishment of an integrated system of planning, assessment, management and decision-making.

Two examples are illustrated here of the role of EIA in the decision-making process. First [Fig. 4.2] is an illustration by Munn [1975] which shows EIA as an integral part of the planning and decision-making process, and second [Fig. 4.3] is an illustration by Sadler [1989] which shows the role of EIA in the decision-making for sustainable development.

In the planning and decision-making process by Munn, EIA is strictly confined to projects. The formulation of government goals is carried out without any EIA, nor in decision-making at policy or programme levels. The result of EIA at the project level does not provide any feedback for a review or any modification of goals, policies or programmes. There is the element of post-auditing but this is also confined to the development of the respective project. Munn's example therefore does not conform to the framework for EIA in sustainable development, which requires that EIA is integrated into the planning and management of resources i.e. EIA is applied at all levels of decision-making.

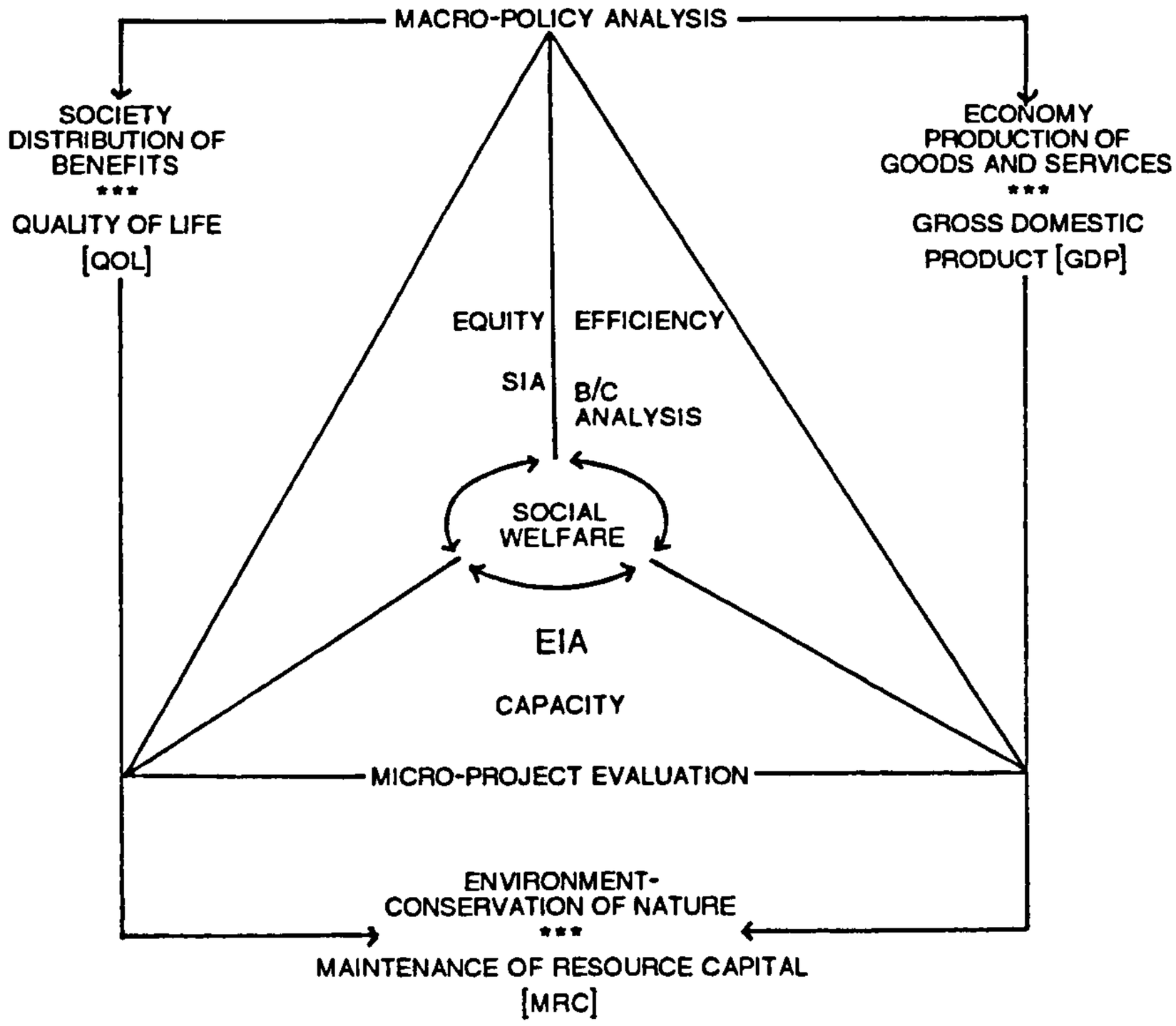
The illustration by Sadler shows a broader, more integrated framework for analysis and choice in sustainable development which is oriented toward achieving environmental, economic and social priorities. On the wider framework is macro-policy analysis for the distribution of benefits [quality of life] and production of goods and services [material welfare]. While the quality of life determines the level of maintenance of resource capital [MRC] and conservation of nature, it also influences and is in turn influenced by the level of economic production of goods and services i.e. GDP. Within the internal framework is micro-project evaluation which is directed toward social welfare. This internal framework is governed by macro policy analysis of the wider framework. The ultimate development is determined by the carrying capacity [information derived from environmental analysis and environmental assessment], and efficiency in the utilization of resources and equity, which is the fundamental goal of sustainable development.

FIG. 4.2: EIA AS AN INTEGRAL PART OF THE PLANNING AND DECISION-MAKING PROCESS



Source: Munn 1975.

FIG. 4.3: DECISION-MAKING FOR SUSTAINABLE DEVELOPMENT: CRITERIA AND COMPONENTS.



Source: Jacobs and Sadler 1991.

4.5.7 Institutional arrangements

Effective institutional arrangements are needed to facilitate EIA in performing its role as a planning and decision-making tool for sustainable development. The items to be addressed are: [1] policy; [2] machinery; [3] legislation; [4] personnel; [5] information; and [6] public participation [Ahmad 1986, WCED 1987, Jacobs and Sadler 1991, Bisset 1992, Thanh 1992, Biswas and Agarwal 1992]. General recommendations are made below:

[1] POLICY

The twin goals of development and environmental /natural resources conservation must form part of the national policy which is: [1] achievable i.e. with realistic goals through sound environmental management; [2] specific i.e. priority areas are clearly specified; [3] flexible i.e. open to suggestion and comment at all times; and [4] responsive to the social and cultural traditions of the people of the country. The expected benefits and intended beneficiaries of development projects should be clearly defined and agreed upon from the start.

[2] MACHINERY

There is no universal model for environmental machineries. Currently these range between full-fledged ministries or departments of environment to one or two officials located in an implementing agency or in the Prime Minister's office. Depending on the governmental structure of the country, the solution is to have an environmental machinery with an adequate number of experts who can deal with the different problems which the country faces. The over-riding factor however, is the commitment from the leadership. Linkages of EIA with the planning of social and economic developments must be clear. EIA methodologies should incorporate requirements for climatic, social and cultural characteristics and must be within limited costs and expertise available and within reasonable timeframe.

[3] LEGISLATION

There is no universal model for an EIA legislation, except that it must include [1] a statement indicating when an EIA is necessary; [2] an indication of what the EIA must contain; [3] a section which empowers a certain body to review the EIA and another body to settle disputes; and [4] an indication of the legal/administrative sanctions if the law is not complied with. The concept of environmental auditing could be introduced for environmental protection in certain development projects. EIA should be made mandatory in a phased manner, based on priorities and expansion of infrastructure.

[4] PERSONNEL

There is a need for generalist managers whose tasks are to co-ordinate the EIA and be responsible for the non-technical experts and to manage the work of technical specialists. Technical specialists are responsible for the baseline study and the quantification of impacts, and assist the co-ordinator in comparing alternatives. An important factor is inter-disciplinary teamwork; the 'hardware' specialists must work with 'software' specialists [in community development, public information, women-in-development, institutional strengthening, etc]. Where necessary, there must be EIA education and training which focus on the practical and operational aspects of EIA, not on theoretical applications only.

[5] INFORMATION

There is a need for a central depository of environmental data either in the form of a library where documents are sent for storage and distribution, or only keeping an up-to-date directory of available documents. Whichever form it is, there must be sufficient staffing and funding.

[6] PUBLIC PARTICIPATION

Public participation in EIA comes in two forms: [1] direct involvement of the public; and [2] inclusion of local values in environmental methodologies. The first form is in the scoping stage, and the second form is in the form of public participation after the report is complete and made public. In both forms, they must meet some general principles which determine that the opportunity to participate is given to all parties who will be affected by the proposed action; ensure that one man's gain does not become a society's loss; that public participation is an on-going activity; and that the procedures are according to the situation and location.

4.6 STRATEGIC ENVIRONMENTAL ASSESSMENT [SEA]

The examination of the NEPA philosophy in section 4.3.1 has revealed that EIA was/is meant for all levels of decision-making; from PPPs to projects. However because of the complexity of incorporating EIA at the PPP levels, it has been generally project-oriented, in the USA as well as in other countries which later adapt the USA system of EIA to their local political and institutional frameworks.

Ten years after NEPA, the limitations of project-level EIA were acknowledged, and this is reflected in many literature on it. The trend of EIA and related research in Canada, which also reflects the international trend, pictures the changing emphasis of EIA from project design and mitigation to linkages between impact assessment and policy-planning and implementation-management phase. Currently, interests in scientific and institutional framework for EIA, planning and management are being re-thought and restructured in response to goals of sustainable development.

The examination of EIA in section 4.5.3 identifies some limitations in EIA as a tool for sustainable development. Most of these limitations, on examination, are due to its general project-orientation. Suggestions made in sections 4.5.4 - 4.5.7 for the role of EIA in sustainable development include the formal application of EIA at the PPP levels, development of new methods of EIA within the context of its new roles, and the development of new institutional frameworks to formalise, and if necessary legalise, the new forms of EIA. The framework suggested for EIA in sustainable development ends with the conclusion that there should be a link between policy, planning, assessment and management. This is in line with the recommendation by the Brundtland Report [WCED 1987] that in principle EIA is applied to all levels of decision-making and should cover PPP as well as projects:

> "A broader EIA should be applied not only to products and projects, but also to policies and programmes, especially major macroeconomic, finance, and sectoral policies that induce significant impacts on the environment." [WCED 1987, p.223].

The need for EIA in long-term planning has in fact been proposed by Jain *et. al.* since 1981:

> "EIA fits into the long-term planning process because it provides the vehicle for identifying the potential effects of activities on the environment. While the immediate knowledge of these effects is important, *the long-term aspects of impacts are probably more important*, because *only a long-term horizon can adequate, effective, and low-cost alternatives to reduce the impact be identified.*" [Jain et. al. 1981, p. 19] - italics are for emphasis.

Because of the strategic nature of EIA at the PPP levels, it has been rightly termed Strategic Environmental Assessment [SEA] [Wood and Djeddour 1990, Therivel *et. al.* 1992]. References to EIA at the PPP level from now onward in this thesis will be termed as SEA, while EIA refers to project-level EIA.

This section examines some examples of current approaches in SEA, followed by recent thinkings on the "theoretical" frameworks for the integration of SEA into current planning processes.

4.6.1 Examples of relevant approaches

Below are several examples of planning/environmental assessment of PPPs which have been in practice since NEPA in the USA [Areawide EIS, PEIS, RMP, SIA and UIA], and later approaches in assessing cumulative impacts [CIA] and generating proposals [UET]. It is noted that CIA and UET are not examples of SEA. However they are illustrated here as alternative approaches to SEA, but nevertheless are relevant to be considered for possible application in Malaysia. Developed under different conditions and concepts, these approaches have different forms and contents, and different planning/assessment approaches. However they have common objectives i.e. the achievement of goals of sustainable development through an integrated planning and management of environmental resources Experiences with these approaches prove that SEA or environmental appraisal in the development and assessment of PPPs can work, particularly with the backing of a formalised [legalised if necessary/possible] institutional framework, approach, process and methods. These concepts can contribute to further developments in SEA.

Areawide EIS

The requirement for Areawide EIS in the USA is to assist in assessing environmental impacts of alternative patterns of urban development or redevelopment in metropolitan-scale areas. Guidelines for its preparation are provided in the *Areawide Environmental Impact Assessment Guidebook* produced by the USA Department of Housing and Urban Development [HUD] in 1981.

The advantages of Areawide EIS which were described by the USA.HUD were quoted by Therivel et. al. [1992]:

> "The areawide approach is particularly well suited to environmental assessment in *areas expecting new or renewed urban development. Cumulative effects* of projected development can be identified as can appropriate mitigation measures... At the time specific individual projects are proposed, those projects can be evaluated within the pre-established context of the area wide assessment ... This approach assures that likely project impacts are evaluated on a more *comprehensive, cumulative, areawide basis.* It also increases the usefulness of the analysis because decision-makers can eventually become more and more familiar with the data and context of each environmental impact statement for that area." [US. HUD, 1981] - italics are for emphasis.

An examination of three Areawide EIS in the USA, namely [1] the Tri-County Areawide EIS [953.1 sq. Km.] prepared by Tampa Bay Regional Planning Council, Florida [1981]; [2] The Clark County Areawide EIS [1631.7 sq. Km.] prepared by Portland Area Office, USA.HUD, Oregon [1981]; and [3] The Multonomah County Areawide EIS prepared by Professional Analysts for USA.HUD of Oregon [1982], identifies similarities in the EISs in terms of content and types of alternative actions to be adopted by HUD. The EISs generally contain the following:

Content of Areawide EIS:

1. Purpose and need;
2. Alternatives including the proposed action;
3. Affected Environment;
4. Plans, policies and controls affecting the area;
5. Environmental consequences of actions;
6. Adverse impacts which cannot be avoided;
7. Proposal of recommended HUD action;
8. List of preparers; and
9. Final areawide EIS distribution list.

Alternative actions by HUD are:

1. Accept the Areawide EIS as a Mandate e.g.
   - Areas considered *unsound* in the generalized sense, would not be considered for HUD approval;
   - Site-specific assessments would still be required of areas listed as *sound*; and
   - EIS would not be required merely because the size of development exceeded the HUD threshold.

2. Accept the Areawide EIS as a Guidance Tool e.g.
   - Areas considered *unsound* in the generalized sense, would be considered by HUD only if engineering or other required data supported appropriate mitigation to make developments environmentally acceptable; and
   - HUD appraisers would use the basic data included in the Areawide EIS in making assessments and in preparing any required EIS on HUD-assisted projects, and update and refine as needed.

3. Nonacceptance of Areawide EIS / Continue present review procedure e.g
   - Continuance of present environmental review procedures on a response basis.

It is noted that in all three cases, HUD had chosen Alternative 2.

The Clark County Areawide EIS outlines the purpose, focus and use of the Areawide EIS, as outlined by HUD:

"*Purpose* :
to ... provide a general outline of areas that are likely to require expensive mitigation measures, sensitivity analysis, time delays, and possible litigation in advance of public or private commitment of funds and time... point out areas where particular problems exist ... delineate known areas where it is unlikely that HUD standards can be met...
Focus :
on ... environmental considerations that should be weighed in the early planning stages of proposed development... explores environmental factors in broad strokes that are general in order to paint an overview of the primary environmental impacts that might occur because of increased human settlements...
Used by:
... general governmental units in evaluating functional plans and in determining impacts of activities within a broad areawide context; and ... private concerns contemplating development projects [lenders, developers, builders and buyers]."
[Clark County Areawide EIS, HUD of Oregon, USA, 1981]

The Areawide EIS approach shows a *tiered-EIA system* in which a broad type of EIA is prepared for a metropolitan-scale area, to be the framework for future actions which require more detail project EIS in the same area. The form of alternative actions by HUD in all three Areawide EIS examined confirm this approach.

Cumulative Impact Assessment [CIA]

CIA is a relatively new concern in the evolution of EIA in environmental planning, assessment and management. As recent as 1986, the USA and Canada were still discussing and even at that time had not come to any consensus on the definition and scope of CIA, the relationship between science and management in the exercise, responsibilities, its role in planning and management, monitoring activities, approaches, and scientific and management issues that are related to any system of assessment and management [CEARC and NRC 1986].

Cumulative Impact Assessment is described as a form of pattern of analysis, and a tool for managing cumulative effects, while *cumulative effects management* is the management of patterns [Erckmann 1986]. These patterns refer to the changes brought about to the environment by [1] the addition of materials, and [2] by the removal of materials, by human activity. Factors for cumulative impacts are the frequency of occurrence of the activity, distance between perturbances, and the fact that different perturbations can produce the same effects accumulatively. These factors are related to the rate of development which determines the types and levels of human activities. Of great concerns to environmental scientists are how to determine whether cumulative impacts are likely; to determine the most appropriate warning signals; and how to undo cumulative impacts [Orians 1986].

The link between EIA and CIA is imperative. Erkmann [1986] is of the opinion that because of the site-specific, single-development orientation of conventional EIA, it is *improbable that conventional EIA can do the job of CIA*. However he suggests three ways by which *EIA can be incorporated into CIA*: [1] incorporate hypotheses testing and post-development audit of predictions into EIA; [2] regional coordination of EIA could involve the

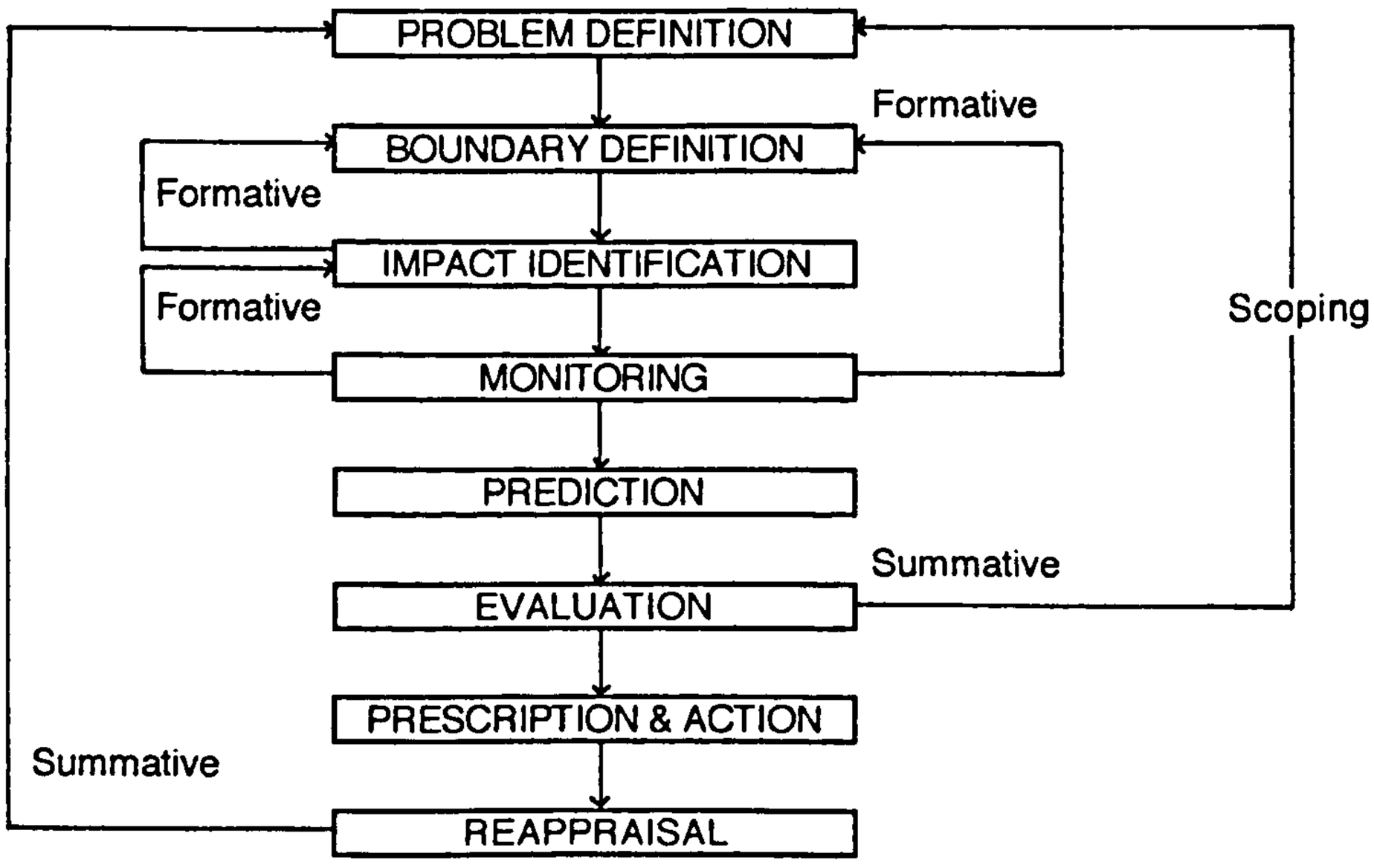
allocation of generic studies to individual assessment responsibilities; and [3] feed into and draw from regional ecological synthesis.

To date there is, as yet, apparently no satisfactory simple mechanism for adopting one-project specific EIA to deal with multiple or cumulative impacts. Therefore Erckmann's suggestions have not been confirmed or disputed. Roots [1986] however reports that environmental effects of previous and interacting activities are very often already taken into account in the environmental assessment procedures. Thus some effective CIA is already being done. Munro [1986] suggests that the *solution to utilising EIA in cumulative impact management, is to link it with land use planning*, that is by assessing:

> "the combined impact of a number of actions expected to take place over time, and in relating the assessment to the land use planning process ... and provide an effective institutional linkage." [Munro 1986, p. 29]

A significant development on CIA has been made in New Zealand, from a case study of the Meremere Ecological District [Cocklin 1989, Cocklin and Parker 1989, Cocklin and Parker 1990], which suggests a procedure for CIA or what is termed in the study as the procedure for the assessment of cumulative environmental change [Fig. 4.4]. The procedure is very similar to that of EIA, indicating the close link between the two.

FIG. 4.4: PROCEDURES FOR THE ASSESSMENT OF CUMULATIVE ENVIRONMENTAL CHANGE



Source: Cocklin 1989.

Cocklin [1989] identifies *three approaches to CIA*; [1] the regional analysis approach; [2] the ecosystem approach; and [3] the project analysis approach. The regional analysis and

ecosystem approaches are claimed to be better as they recognize more explicitly the interactions between sources of environmental change and hence provide better basis for prediction and evaluation. CIA is claimed to be a logical step forward from EIA, as the management of cumulative change is consistent with sustainable development goals. The impediment to CIA however is its complexity, as there is also a need to assess cumulative social impacts.

Cocklin and Parker [1990] suggest *two ways in which EIA can contribute to CIA*. The first approach is to extend the terms of reference of EIA to include cumulative impacts. However the setback to this is that the approach is still reactive in nature, and this is inconsistent with sustainable development principles. The second approach is to reorient EIA and management in order to achieve a regional focus, as this approach is more proactive. The second approach is similar to the suggestion by Munro and the second and third suggestions by Erckmann mentioned earlier. It is noted that the Meremere case study is based on the second approach by Cocklin and Parker.

Findings from the Meremere Ecological District case study on CIA are also close to Munro's suggestion that CIA be linked to land use planning. Conclusions made by Cocklin and Parker [1990] include:

[1] CIA studies should be accompanied by a continuous state of the environment reporting;

[2] CIA and the state of the environment reporting are consistent analytical frameworks relevant to the goal of sustainable development;

[3] There is great potential for the Geographical Information System [GIS] for sustainability-oriented research, state of the environment reporting, and CIA; and

[4] CIA and management should be recognized and adopted as an integral component of environmental and social planning.

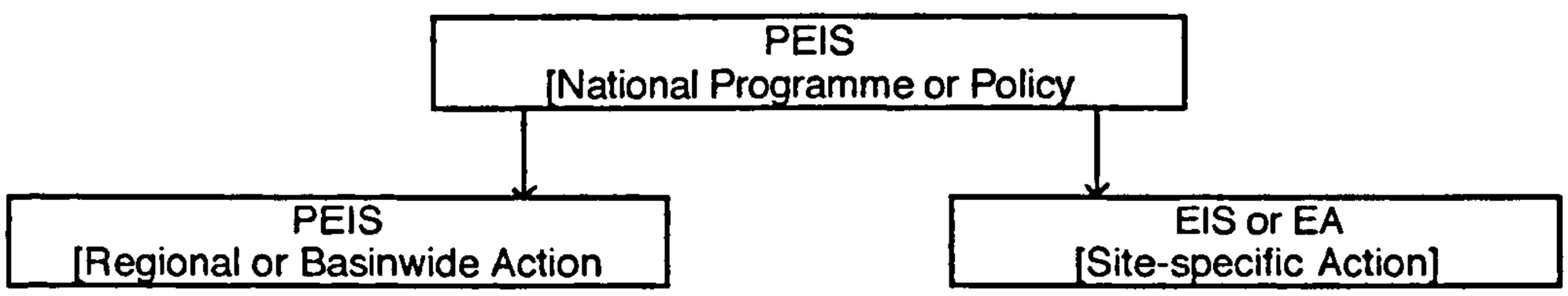
The findings made by Cocklin and Parker are stepping stones for more scientific and institutional research on CIA and cumulative impact management, and the role of EIA in assessing cumulative impacts.

Programmatic Environmental Impact Statement [PEIS]

PEIS is generally required in the USA for broad federal agency programmes that result in irretrievable commitment of resources. A PEIS is a document that identifies for the decision-maker environmental impacts of a *group* of federal actions that are *mutually related* either *geographically, generically* or by *stage of technological development*. It is also prepared for *connected* actions [e.g. Forest Land and Resource Management Plan], *cumulative* actions [e.g.Owens River Basin, Seven Hydroelectric Projects] and *similar* actions which are grouped together and evaluated in a single PEIS [Sigal and Webb 1989].

EA or EIS for specific projects within the programme which is covered by PEIS are tiered to the PEIS. These EIS are not to duplicate the PEIS but to summarize the relevant information and incorporate it by reference. When all significant issues cannot be treated in PEIS, additional separate EIS are prepared on some or all of the individual actions covered by the programme This is putting into practice the *tiering concept* set by the Council for Environmental Quality [CEQ], as discussed in section 4.3.1. The concept of tiering the EIS to PEIS makes the PEIS appropriate for agencies which set national goals as well as are responsible for implementing them. Sigal and Webb [1989] illustrates the tiering concept under which PEIS is prepared [Fig.4.5].

FIG. 4.5: TIERING OF ENVIRONMENTAL DOCUMENTS AS OUTLINED IN CEQ [NEPA OF USA] REGULATIONS



Source: Sigal and Webb 1989.

PEIS is prepared in compliance with CEQ's NEPA regulations [40 CFR §§1500 *et seq*] which became effective on 30 July 1979 [Webb and Sigal 1992]. The preparation of PEIS is guided by good judgement and intelligent decisions on the scope and timing, as there is no specific guideline for PEIS *per se*. Even the decision on whether or not to prepare PEIS is left to the discretion of the agency. This could be taken as a reflection of the greater emphasis on project-level EIA in the USA.

Webb and Sigal [1992] quoted limitations imposed by CEQ regulations on the preparation of PEIS. Agencies are not allowed to undertake a PEIS for programmes which may significantly affect the quality of the human environment unless the action is [1] justified independently; [2] accompanied by an EIS; and [3] will not prejudice the ultimate decision on the programme. However CEQ puts much emphasis on public participation, particularly during the scoping exercise.

Although appropriate for agencies which set national goals, PEIS are currently prepared only for agency plans or programmes. They are most frequently prepared for the following categories of actions:

- Regulatory analysis of a proposed regulation;
- Programmes for flood or pest control;

- Area-wide and technology development programmes;
- Resource management;
- Water development; and
- Policies for rates and permits.

The latest examples of PEIS given by Webb and Sigal [1992] are the Nuclear Weapons Complex Reconfiguration [1991/1992] by the Department of Energy [DOE] which received 36,984 comments from 16,542 members of the public at the draft stage; and DOE's Environmental Restoration and Waste Management Programme [1991/1992 - expected to be completed in 1993] which received 7,000 comments from 1,200 members of the public.

In the past agencies have been resisting PEIS because of the cost, delay and commitment during the preparation time. Recently there has been an increase in the interest in PEIS, possibly because agencies and the public have realized that PEIS can better highlight and anticipate potential environmental problems, prevent future delays, assist in long-range planning, and prevent or simplify litigations [which is the norm in the USA]. However to date PEIS have not been formally applied at the broadest level of policy formulation.

Resource Management Plans [RMP]

RMP is prepared by the Bureau of Land Management [BLM] of the USA under the Federal Land Policy and Management Act of 1976 [FLPMA] which requires that management of public lands must be on the basis of *multiple use* and *sustainable yield*. The philosophy of RMP is that EIS and land use planning are done at the same time, in a s*ystematic, interdisciplinary approach* to achieve *integrated* consideration of physical, biological, economic, and other services. In compliance with FLPMA and NEPA, the RMP exercise produces three documents i.e. *Draft RMP/EIS, Proposed RMP/EIS* and *Approved RMP/Record of Decision*. RMP establishes resource conditions, goals and objectives, land use allocations and limitations on the use, and management directions [more detailed plans, specific actions, and standards for monitoring the plan] [Williams 1986, Williams 1990].

RMP is prepared within a *3-Tier planning/assessment system*. The RMP is in the middle Tier, since it gets directions from national policies in Tier 1 and acts as the framework for Activity Plans which are in Tier 3. The planning process reflects the systematic planning/assessment procedure which follows after the *rational planning model* [Fig.4.6].

To counter criticisms against the complexity of the rational planning model, BLM has made RMP action-oriented, issue-driven and its preparation is totally decentralized i.e. one RMP is prepared for one resource management area, or on occasions, for a joint resource area, and the resource manager is the planner. The key to RMP is the formulation of

alternatives, the impacts of which are contained in the EIS. These impacts are considered in the development of the preferred alternative. An excellent example of alternatives is provided in the 1988 San Rafael Draft RMP/EIS [BLM Utah State Office 1988] as summarised below:

A No Action [continue present level of management of public lands and resources];

B Maximize livestock grazing and mineral production while providing for right of way corridors to aid development;

C Maximize opportunities for non-motorized recreation, and protect wildlife habitat;

D Provide for the maximum watershed condition by minimizing surface disturbance in critical watershed areas, and provide maximum protection of cultural resources;

E Maximize access and opportunities for motorized recreation; and

F [Preferred alternative] Provide for the protection of critical soils and scenic resources, protect crucial wildlife habitat, provide special management for certain vegetation and cultural resources values, and maintain existing livestock.

RMP is not without difficulties [Williams 1986]. However the 1979 FLPMA Regulations reduces data collection by making RMP be based on issue identification and planning criteria, and taking steps so that unnecessary data collection and analysis are avoided. To solve criticisms against the rigid sequence of the planning steps, the Regulations stress that the planning process must not be rigidly sequential. From all these actions, the time to be spent on RMP was directed to be 24-30 months, which is a big reduction from 4-5 years taken by the pilot RMP. Although most RMP managers feel that the use of Geographical Information System [GIS] - which is used in many RMP - are helpful, questions are always posed on the cost of developing the GIS, criteria needed for determining its use, its cost-effectiveness, how it should be funded, and who should be directing its development.

Although RMP is based on the multiple-use philosophy, an examination of 211 RMP/EIS in 3 Western States by Mills and Mohai [1988] reveal that there seems to be a minerals-domination in the RMP. However the study cannot determine whether the focus on minerals is related to its inception or whether they reflect more recent developments. Mills and Mohai concluded that the minerals-domination is the result of the agency's lack of organizational and political resources to resist pressures from Administration appointees, rather than that BLM decision-makers necessarily have a value orientation emphasizing commodity uses. This proves yet again that any planning or management ideology adopted by an agency is translated into management priorities only in as much as political pressures allow.

FIG. 4.6: THE RESOURCE MANAGEMENT PLANNING [RMP] PROCESS

RMP Steps	*RMP Actions*	*Rational Planning Model*
	NOTICE OF INTENT	
	↓	
	INITIATES PROCESS	
	↓	
1*	IDENTIFY ISSUES	Action as a rational choice
	↓	
2*	DEVELOP PLANNING CRITERIA	Goals and objectives
	↓	
3	COLLECT INVENTORY DATA & INFORMATION	
	↓	
4	ANALYSE THE MANAGEMENT SITUATION	
	↓	
5	FORMULATE ALTERNATIVES	Options
	↓	
6	ESTIMATE EFFECTS OF ALTERNATIVES	Consequences
	↓	
7*	SELECT PREFERRED ALTERNATIVE	Choice
	↓	
8*	SELECT THE PLAN	Choice
	↓	
	PROTEST PERIOD	
	↓	
9	MONITOR & EVALUATE THE PLAN	

**Public participation is invited throughout the planning process, but is formally requested at these steps*

Source: Adapted from BLM [undated], Williams 1986.

Social Impact Assessment [SIA]

SIA was developed because NEPA and official guidelines for the implementation of EIA only laid stress on the natural environment [Wolf 1983a]. Social impacts which were included in the guidelines were limited in scope and were not emphasized. The need for greater emphasis on social impacts became apparent when many developments which were subjected to NEPA resulted in significant social impacts. Two particular development contexts in the USA were important to the development of SIA: [1] the number of projects planned for land to be used and occupied by Indians; and [2] the increase in energy-related developments in rural western states [Bisset 1991].

Many early EIS [1979-1975] in the USA include socio-economic impacts such as demographic and economic changes, while 'social' as opposed to 'socio-economic' impacts were ignored. These 'social' impacts refer to changes in social relations between members of an institution, community and society resulting from external change. These could be relationships and obligations to kin; marriage patterns; relationships between generations; visiting patterns; political and dispute resolution; institutions and processes; values; and the importance and significance of various features of the environment and social life for a group of people [Bisset 1991].

The basic question asked in SIA is 'Who benefits and Who loses?' [Wolf 1983a]. However SIA does not prescribe what social values 'ought' to be. It only attempts to determine what the equity impacts would be should one course of action take place. This is because the dissociation of costs [or risks] and benefits creates a problem of equity. The 'Why' question is related to some notion of "*social well-being* or *quality of life* ... what it is, how do we know when we have it, and how can we get more of it." [Wolf 1983a]. The disadvantage however, is that unlike the more familiar evaluation research which analyses the effectiveness of policies, programmes and projects already in operation, the task for SIA is anticipatory research.

SIA is generally not an independent form of project appraisal, but forms a part of EIA. Topical areas of SIA interest include community development; industrial development; coastal zone management; water resources; energy development; education and manpower; weather modification, highways and mass transit; parks, forests and wildlands; buildings and housing; health and human services; and toxic substances. However there is no standard techniques for assessing social impacts, and also a lack of general theory of social change which is widely applicable. The World Bank, recognizing the importance of social impacts, indicates the type of SIA which will be required as part of an overall EIA in the Environmental Assessment Sourcebook for use by a Borrower Country. Five topics which are considered significant and must be dealt with thoroughly are involuntary resettlement, new land settlement, indigenous people, induced development and cultural property.

Urban Impact Analysis [UIA]

Urban Policy Impact Analysis [UPIA], which was later termed Urban Impact Analysis [UIA], is the result of the USA Government's first National Urban Policy [NUP] in March 1978. UIA is the result of a Presidential *Executive Order* made in August 1978 requiring *federal agencies* to carry out 'urban and community impact analysis' [UIA] *in advance*, the *unintended spatial consequences* or effects of *new* programmes and policies on *urban areas* such as central cities, suburbs and non-metropolitan areas. The variables that were to be measured were largely economic, such as employment, local fiscal condition, and population [Glickman 1980].

UIA differs from EIA in terms of their areas of focus and methodological issues. While EIA focuses on projects and their effects on the environment and people, UIA focuses on policies and their effects on places and economics. This gives rise to methodological issues which include the calculations of short-term and long-term, as well as direct and indirect impacts of policies, particularly when many of the economic variables discussed are not generally available on a small area basis, thus making precise impact estimation difficult [Glickman 1980, Massey 1980, Breheny 1984].

The lack of legal status as well as methodological issues make the development of UIA less smooth than that of EIA. Markusen [1980] and Massey [1980] suggest that an improved UIA should have a legal status akin to EIA; extended to particular projects and the aggregate impacts of several interrelated policies; have a specific agency responsible for it instead of the policy-initiating agency; include alternatives and mitigation measures; should include major private sector actions; link documentation of private sector impacts with measures to mitigate them; and should study effects of policies on both people and places.

Massey [1980] and Breheny [1984], in the evaluation of UIA and its application in the UK, agree with the legal and methodological problems of UIA but suggest that the main problem of adopting it in the UK is that it is "entirely inconsistent with the traditional working methods of British civil servants" [Breheny 1984]. While the UK central government policy-making process is described as incremental, strictly sectoral, short-term and simply a budgetary device, the local government policy-making process is described as to have retreated from interests in theoretical and rational procedures, and strategic planning. However, in recognition of the strong local government planning system in the UK, Breheny suggests that UIA could be adopted in the UK with the following possibilities:

[1] Focus on direct and indirect *local effects of central government policies*, and major private sector initiatives;

or

[2] Concentrate on the assessment of *impacts of local initiatives*, covering local authority policies, policies of other local public agencies [water, gas, etc] and possibly local private sector initiatives, and with a specifically spatial component;

or

[3] Both [1] and [2], which actually is similar to the proposals of the UK local authority planners in late 1970s for comprehensive monitoring schemes as a basis for a continuous planning process [a proposal which had not met with much success].

The development of UIA is not relatively successful in the UK as compared to the USA. Instead there has been more progress in strengthening the development plan system and policy appraisal, as evidenced in the documents examined in Chapter 2.

Ultimate Environmental Threshold [UET]

The UET method was first applied during the preparation of the Tatry National Park in Poland in the late 1970s, and tested in the Australian Great Barrier Reef Marine Park in the early 1980s and the Brisbane Forest Park in the mid-1980s [Kozlowski et. al. 1988, Kozlowski 1990]. It was developed as a response to the apparent limitation of conventional EIA practice in proactive planning approaches, and the need to integrate conservation and development towards the achievement of sustainable development. While conventional EIA is used to assess development proposals which have been identified in the planning process, UET is used to generate such proposals, since it was developed as a systematic process for analysing, formulating and evaluating a plan.

The UET concept is based on the assumption that there are environmental thresholds [called UETs] that can be overcome only at the expense of serious and irreversible damages to the natural environment. These "UETs indicate the final boundaries of possible locations, levels, quality or rate of development of a particular activity, and stem from the potential of natural resources needed for this activity, or from its side effects." [Kozlowski 1990 p. 312-313]. Although it can be applied as a self-standing exercise, it is primarily supposed to be an integral part of a planning approach which is strongly-related to Threshold Analysis from which it was initially derived.

In examples of hypothetical applications of EIA and UET methods on one settlement by Kozlowski [1990], the UET approach shows advantages over EIA in several ways. EIA was only applied to the tourist project [no alternatives were considered because the developer only owns the land adjacent to the existing development], while plans for industrial and high-rise residential developments in the area are not assessed because they are not in the list of projects requiring EIA. UET on the other hand provides the authority with information about the ultimate capacity of the whole area, thus making any later application for further expansion of the tourist resort or any other type of development easily assessed in a comprehensive manner.

The UET approach has not been much utilised nor tested. One of its major difficulties identified by Kozlowski is the high input expected from environmental scientists, who normally find it difficult to understand and/or appreciate the everyday reality of the planning profession, i.e. the low budget and short time-frame normally faced by professional planners [Roberts and Roberts 1984]. There is also the lack of adequate empirical data and of readily available techniques permitting reliable predictions of adverse environmental impacts, which are the base for identifying UET. However, it is believed that further development and refinement of UET towards practical integration of ecological considerations into planning

and, consequently, development decision-making processes could be achieved by further research and testing [Kozlowski 1990].

4.6.2 SEA principles

The need for SEA

The need for SEA which has been established in the earlier sections has been summarised by Wood and Djeddour [1990], and further summarised below:

- To give *equal importance to environmental concerns* as for other aspects of development *in decision-making*, and encourage decision-makers to *consider environmental goals simultaneously with social and economic goals*, i.e. to enhance the role of environmental concerns within non-environmental organizations;
- To *facilitate and increase consultation on environmental aspects* between organizations generally involved in the formulation of PPPs, and provide the *opportunity to determine the views of the general public* on the nature of future developments which result from these PPPs;
- To *reduce the number of project EIAs* required, either by rendering project EIA redundant if impacts have been examined sufficiently at the PPP level, or to *reduce the number of impacts assessed at the project level* if the strategic impacts have already been addressed at the PPP levels;
- To *facilitate the formulation of mitigation and compensation principles* which can be embodied in codes of conduct for each particular project e.g. road construction, mountain or coastal development;
- To *facilitate the assessment of alternatives* which cannot or are difficult to be assessed at the project level e.g. technology, use of resources, lifestyle, etc and their global impact on the environment; and
- To *facilitate site selection , cumulative impacts, synergistic and ancillary impacts, regional impacts and non-project impacts*, which cannot be done in project EIAs.

Tiered planning/assessment system

Differences between projects and PPPs indicate that there should be differences between the processes, methods and parameters of SEA/EIA at each level [Foster 1983, Kozlowski 1990]. There can be different forms of SEA relevant to each development level, and each type can have different spatial scales and subjects of analysis, and various alternatives that can be evaluated with these SEA forms. In this 'tiered' SEA/EIA structure environmental implications of policies at different levels of governments are regarded as the "top level" of environmental decision-making [Foster 1983]. Table 4.6 is an adaptation of the table indicating a tiered EIA structure by Foster [1983] to a structure of tiered SEA/EIA. Each level

of SEA can be given different labels since it has different spatial scales, main subjects of analysis and different types of alternatives to assess.

TABLE 4.6: DIFFERENT FORMS OF SEA/EIA WITHIN A TIERED SEA/EIA STRUCTURE

Descriptive Label	Spatial Scale	Main Subjects of Analysis	Alternatives
Policy SEA	Usually National e.g. Legislative SEA	A Policy seeking to achieve a sector/multi-sectoral objective	[i] Alternative policy to solve same problem [ii]Alternative implementation proposals for policy
Plan SEA	Can be National Regional or Local	Collections of policies constituting plan, resource allocation	[i] Different integrations of policy options [ii]Alternative ways of implementing policies
Plan SEA	Distribution of localities or sites suitable to a particular category of development in a region	Sites or localities suitability to defined category of development or technologies	[i] Alternative series of localities or sites [ii]Alternative uses of sites or localities
Programme SEA	Can be National,Regional or Local	Linked series or actions over defined areas	As for Plan SEA
Project EIA	Project at a particular site 5 to 10 miles radius, 50 miles max.	Impacts of projects at proponent's preferred site	[i] Alternative sites that could accommodate project [ii]Alternative technological design forms or project

Adapted from Foster [1983].

Consistent with the different scales and levels of analyses, Policy SEA assesses impacts of sectoral policies, or multi-sectoral in the case of land use policies. Plan SEA at the National/Regional levels assesses impacts of plans which constitute national/regional policies, while Plan SEA at regional/local level assesses regional/local policies as well as long-term resource allocations. Plan SEA at the local level can also be used to assess impacts of site allocations of different activities necessary for development. Programme SEA can be adapted for assessment of programmes at national/regional/local levels. The form and content of each level of SEA is determined by the main subjects of analysis and alternative to be assessed.

The flexibility and adaptability of the EIA concept makes this tiered system of SEA/EIA possible. Experiences in California [Wood 1990, Bass 1990, Lee and Walsh 1992], Australia [Wood 1992], Canada [Couch 1990, Lee and Walsh 1992], New Zealand [Church 1990] and some European countries such as the Netherlands [Verheem 1992], and to a lesser extent in France and West Germany [Lee and Walsh 1992] indicate that it is feasible to introduce SEA

at the PPP level. In a further development of Wood's tiered EIA structure, Lee and Walsh [1992] suggest a sequence of actions and assessments within a tiered planning and assessment system [Fig. 4.7]. A hierarchy of land use plans requiring different SEA actions are also indicated.

FIG. 4.7 : SEQUENCE OF ACTIONS AND ASSESSMENTS WITHIN A TIERED PLANNING AND ASSESSMENT SYSTEM

Category of action and type of assessment [in brackets]

Level of government	Land use plans [SEA]	Sectoral and multi-sectoral actions			
		Policies [SEA]	Plans [SEA]	Programmes [SEA]	Projects [EIA]
National/ Federal	National land-use plan	National transport policy*	→ National Transport policy*	→ Long-term national roads plan*	→ Construction of motorway section*
		National economic policy	→ Regional strategic plan	→ Sub-regional investment programme	→ Local infrastructure project
Regional/ State	Regional land-use plan				
Sub-regional	Sub-regional land-use plan				
Local	Local land-use plan				

* Examples of a hierarchy of actions

Source: Lee and Walsh 1992.

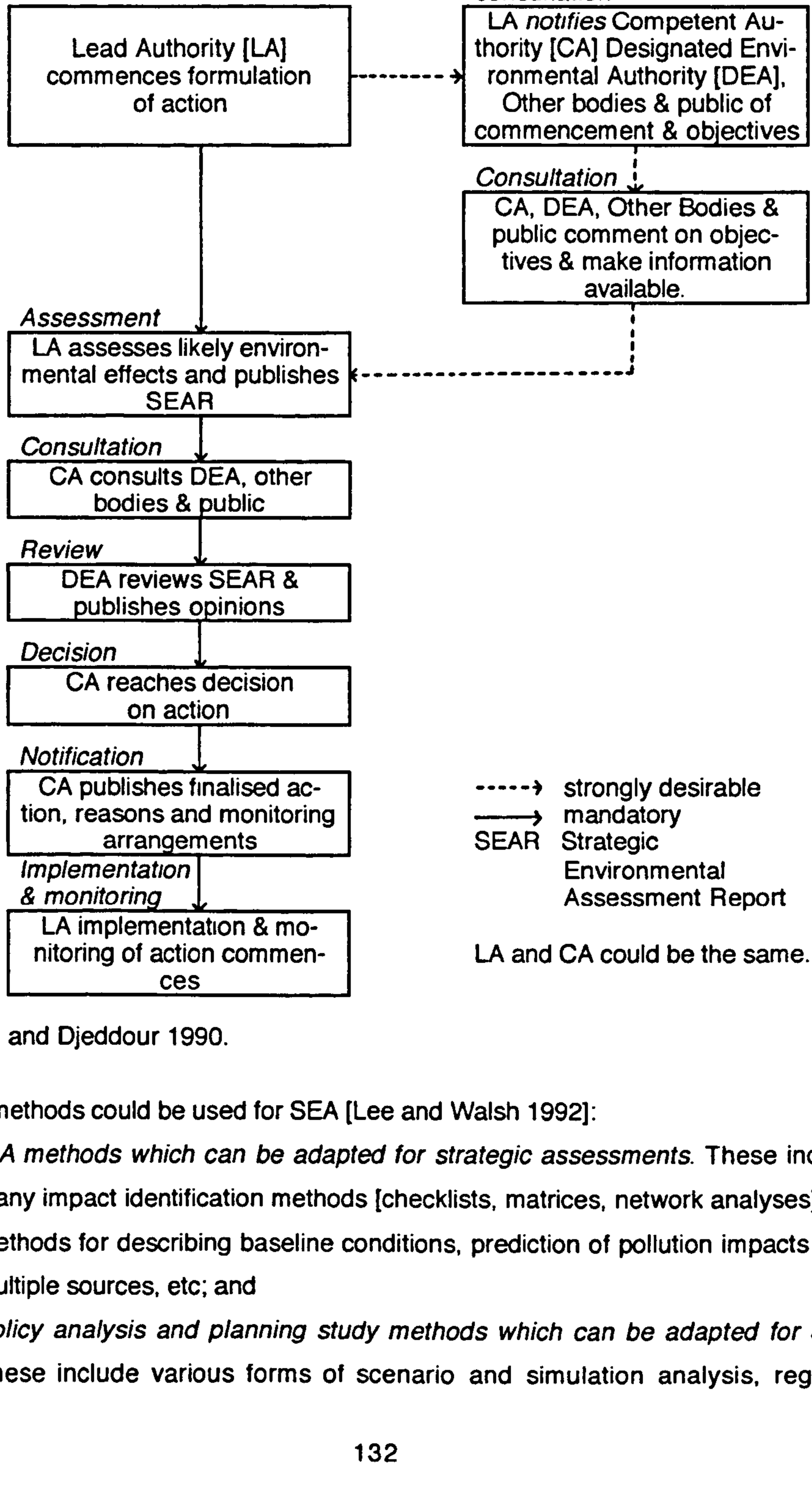
SEA process, content and methods

Many authors claim that project EIA can apply to PPPs, but not without difficulties [Lee and Wood 1980, Foster 1983, Clark 1983, WCED 1987, UNDP 1988, Sadler 1988, Partidario 1991, Therivel 1991, Blowers 1993]. A rational approach to impact analysis for PPPs requires the separation of issues which are related to projects from those issues which can only be addressed at these levels [Wathern et. al. 1987]. In this respect differences between the nature of projects and those of PPPs must be known. These differences are examined under the heading 'Differences between SEA and EIA'.

As already established, SEA should be integrated into the formulation of PPPs from the earliest possible stage. This principle influences the process, content and methods of SEA. In an SEA process, the authority putting forward the action is the Lead Authority [LA]. The Competent Authority [CA] will often [but not always] be the LA. If the draft SEA Report is published for public comment, then the CA is likely to be another authority. The Designated

Environmental Authority is appointed by legislation or cabinet or the like. Fig. 4.8 illustrates the process of a typical SEA [Wood and Djeddour 1990]. The steps in the process are very similar to that of an EIA, but the 'players' are different.

FIG 4.8 : STRATEGIC ENVIRONMENTAL ASSESSMENT PROCESS



Source: Wood and Djeddour 1990.

Two types of methods could be used for SEA [Lee and Walsh 1992]:

- *EIA methods which can be adapted for strategic assessments.* These include many impact identification methods [checklists, matrices, network analyses] and methods for describing baseline conditions, prediction of pollution impacts from multiple sources, etc; and
- *Policy analysis and planning study methods which can be adapted for SEA.* These include various forms of scenario and simulation analysis, regional

forecasting and input-output techniques, site selection and land suitability analysis, GIS, systems modelling, policy and programme evaluation techniques, goals achievement analysis, planning balance sheets approaches, cost-benefit analysis, constrained cost minimisation analysis, sensitivity analysis and other techniques for handling uncertainty.

The most challenging tasks in SEA are likely to be in scoping and assessment because of its wide scale and complexity, and the *five procedural issues* of confidentiality, constitutionality, procedural deficiency, proponent-competent authority relationship and curtailment of competencies in SEA which, because they merit strong attention, are quoted from Lee and Walsh [1992]:

> "*Confidentiality* The draft contents of certain policies [such as details of central government budget proposals], plans and programmes, may be considered too sensitive to release for public consultation prior to their approval. As in the case of EIA, this may be handled by exemptions from certain consultation arrangements ...
>
> *Constitutional issue* Certain actions [such as high-level policy decisions] are approved by national cabinets ... If these were subject to SEA law, the cabinet decisions relating to them may be subject to legal challenge in the courts. In Canada, this has been addressed by incorporating an environmental assessment procedure within federal cabinet decision-making procedures.
>
> *Procedural deficiencies* SEA, to be effective, should be integrated into existing procedures at key decision-making points for PPPs. These procedures should have the potential to meet SEA requirements relating to the provision of documentation by the proponent, for consultations based on this and the use of this combined information in decision-making by the competent authority ...
>
> *Proponent-competent authority relationship* In certain cases, the proponent belongs to the same organisation as the competent authority. In the case of PPPs, this is likely to occur frequently. One means of safe-guarding the objectivity and quality of the EIA process ... is to submit the EIS to review by an independent environmental authority or commission. A similar kind of solution may be needed to safeguard the SEA process.
>
> *Curtailment of competencies* SEA may be resisted by some government departments as an intrusion into their area of competence. ... It provides a real challenge to governments and, more particularly, Departments with developmental responsibilities, to give greater meaning and credibility to their role in promoting sustainable development." [Lee and Walsh 1992 pp. 133-134].

Differences between EIA and SEA

Due to the differences in the characteristics of projects and those of PPPs [Table 4.7], and five procedural issues highlighted above, the detailed nature of SEA also should differ from that of conventional EIA [Wathern 1988, Wood and Djeddour 1990, Lee and Walsh 1992]. However in principle there are similarities and differences in and between processes, procedures and methodologies [Lee and Walsh 1992].

Similarities between the processes have been illustrated in a chart by Lee and Walsh in Fig.4.9. Their significant differences stem from SEA being applied at the earlier stages of the planning process than EIA.

TABLE 4.7 : CHARACTERISTICS OF PROJECTS VERSUS PPPS

Process or content	*PROJECTS*	*PPP*
Goals & objectives	Restricted consideration	Potentially broad - increasing with higher levels
Alternatives	Sites/technologies	Technical/institutional cross departmental
Lead time	Short	Long
Effective period	Immediate implementation	Medium to long term
Knowledge of future	Reasonably predictable	Imprecise
Environment to be studied	Reasonably specific	Not specific
Environment to be monitored	Specific	Limited

Source: Jones 1983.

The methodological differences between SEA and EIA are related to: [1] the *scale* of an SEA tends to be considerably greater than that of an EIA; [2] the *content* of the action submitted to SEA, which is known in less detail, which is likely to change at later stages and subject to greater uncertainty than actions which are subject to EIA, increase the potential *complexity* of SEA relative to EIA; [3] the degree of detail and accuracy of *information* needed for SEA is generally less than that for EIA; and [4] the *time* available for gathering and analysing information for an SEA is greater than that for EIA.

4.6.3 Developments in SEA

Technically there is no typical example of an SEA which can be used as a model for use. This is partly due to it being a relatively new phenomenon compared to EIA. In addition, the concept of PPP themselves differ from country to country, and this should affect the characteristic of any SEA being developed. However different developments in approaches that are similar to SEA in the international scene can contribute some lessons toward the development of a formal system of SEA . Some of the experiences are summarised below:

United States of America : NEPA, through CEQ, has already established the tiered system of environmental assessment. The system is particularly well-established in California [Bass 1990]. In practice SEA, to a certain extent, is already being practised, although not

generally. There is Areawide EIS for metropolitan-scale developments, PEIS for programmes, and the RMP for resource/land use plans. The procedures and processes of these forms of planning and assessments can provide lessons for further development of SEA.

FIG. 4.9 : SEA AND EIA: A COMPARISON

PRINCIPAL STAGES IN THE PROCESS

SEA	*EIA*
1. *Screening* to determine whether the PPP requires a formal SEA .	1. *Screening* to determine whether the project requires a formal EIA.
2. *Scoping* to determine the coverage & level of detail of the SEA.	2. *Scoping* to determine the coverage & level of detail of the EIA.
3. *Assessment* of the proposed action, modifying the proposal where desirable in the light of the SEA findings.	3. *Assessment* of the proposed project, modifying it where desirable, in the light of the EIA findings
4. *Preparation of SEA report* & submits it in support of the application for approval of the action by the appropriate competent authority.	4. *Preparation of the EIS* and submits it in support of the application for authorisation to the competent authority.
5. SEA report is made available to other environmental authorities & public for information & obtain their *comments*.	5. EIS is made available to environmental authorities & the public for information & to obtain their *comments*.
6. Competent authority takes all relevant information, including the SEA report & the consultation findings into account in reaching a *decision* on the proposed action.	6. Competent authority takes all relevant information, including the EIS & the consultation findings, into account in reaching a *decision* on the proposed project.
7. Make arrangements for *monitoring* & undertake further necessary asessments [SEA and/or EIA] at later stages.	7. Arrangements are made, as required, for *monitoring* of the project & of its environmental impacts.

Source: Lee and Walsh 1992 [summarised]

Canada : The Bill for an EA Act was approved in 1991 but contains requirements for project level EIA only. However there is the requirements for alternatives, cumulative effects and resource sustainability [Lee and Walsh 1992]. Researches funded by CEARC on the development of the scope and content of EIA, such as the development of CIA and the integration of EIA into planning and management, including the application of CIA in land use planning, is very active [CEARC and NRC 1986]. Of particular significance is the research on

the role of EIA in achieving goals of sustainable development [Jacobs and Sadler [eds.]1991].

Australia : Australia has legal provisions relating to SEA, although discretionary in nature. The Environmental Protection [Impact of Proposals] Act 1974 provides for SEA, but only for Federal activities. Generally there is a reluctance by politicians and administrators to extend SEA to non-projects. Between 1974-1991, there is no obvious examples of SEA. Pressures for SEA has been put on the Australian government by the Ecologically Sustainable Development [ESD] Working Groups. This has been agreed in principle by the ANZECC [Australian and New Zealand Environmental and Conservation Council] and the Australian Intergovernmental Agreement on the Environment. Work is on-going to develop the proposals further [Wood 1992]. Case-study research into the development of the UET concept is advancing [Kozlowski 1990].

New Zealand : The Resource Management Act [RMA] of 1991 puts the obligation on decision-makers to assess impacts of their policies and on developers to assess their proposals. These impact assessments are to be integrated respectively into plan-making and into the consent process [RMA 1991, Lee and Walsh 1992]. As reported for Australia, ANZECC is working on the proposal to develop further the use of SEA for PPP in the public and private sectors. Research for the advancement of CIA in terms of its procedure and methods is on-going [Cocklin 1990].

The Netherlands. The Netherlands EIA Act 1986 has already made provision for SEA for certain types of plans and programmes, such as the so-called Structure Plans [electricity supplies, industrial and drinking water supplies, landscaping, nature conservation and outdoor recreation], provincial waste management plans, excavation plans and planning decisions for activities as housing and industrial estates [deJongh 1990, Verheem 1992]. The Netherlands is one of the first countries in Europe to experiment with the application of EIA at the land use planning level [Jones 1983, Foster 1985, Wood 1988b]. These 'experiments' are examined in section 4.6.4.

With the completion of the National Environmental Policy Plan [NEPP] 1989 and the NEPP-Plus 1990, the Dutch experience is one of the combination of EIA application and environmental policy-planning [Verheem 1992], i.e. EIA is used as a decision-making tool, and the "NEPP-translations" [NEPP are translated to target groups of environmental policy: agriculture, transportation, refineries, energy, waste management, and building trade]. These "translations" form the basis for external policy integration on the macro-level, while EIA plays its role at the local level.

The latest move by the Dutch government is the consideration of introducing a compulsory "Environmental Test", or the "E-Test" for short, for policy decisions with major environmental repercussions which do not require any EIA at present. A committee is being set up by the government to study this approach further [Verheem 1992].

United Kingdom: The UK and other European Community members are on the verge of incorporating SEA formally into their planning process, although it is likely that this will only take effect after lengthy deliberations to adapt to each country's institutional frameworks. This move is in response to the Council Directive [August 1992] which amends Directive 85/337/EEC [CPRE 1992]. The content of this directive is examined under its own heading in this section. The DoE has been active in producing guidelines for the introduction of environmental assessment in the preparation of land use plans and in the environmental appraisal of policies by other government agencies. Significant guidelines are made in the Government White Paper on the Environment [DoE.UK. 1990], "Policy Appraisal and the Environment" [DoE.UK. 1991] and PPG 12 [DoE.UK. 1992].

On the 'advice' of the DoE to include SEA in the preparation of development plans under the Town and Country Planning Act 1990, several SEA exercises have been carried out under the initiative of individual local planning authorities. Examples include the Lancashire County Council and the Kent County Council which have recently finished the environmental review of their structure plans by using certain forms of SEA. The Solihull Metropolitan Borough adopts a different approach by undertaking a general environmental assessment of its UDP and includes the results as a chapter in the Plan. These examples are examined in section 4.6.4. Many other local authorities are following suit, such as Cambridgeshire County Council and Aylesbury Vale District Council [Pinfield 1992]. Other local planning authorities have strengthened the consideration of environmental aspects in their planning, for example in the UDP of Newcastle Upon Tyne [Newcastle UDP 1992].

EC Directive

The Council Directive of August 1992 [CPRE 1992] has amended the Directive 85/337/EEC which forms the framework for current practices in the EC countries. 'Activity' now includes "formulation of PPPs proposed by a public authority ... and adoption of rules and regulations." [Article 1]. The Directive allows that the procedure for this new provision be integrated in the existing decision-making or consent procedures [Article 2]. When assessing their activities the lead authority is to pay attention to the compatibility and consistency of the activity with the objectives and actions of environmental protection established at the Community, national, regional and/or local level for the sector concerned.

Plans, policies and programmes are those requiring approval by national, regional or local authorities. They include *sectoral programmes, plans and policies* which plan, promote,

regulate or otherwise influence the future development and operation of activities; *land use and development programmes, plans and policies* which plans, promote, regulate or otherwise influence the future use of land and its development for sectoral and multi-sectoral purposes; and programmes, plans and policies formulated for the purposes of *securing environmental protection* [*Annex 1*].

4.6.4 SEA in land use planning

From Plan EIA to SEA

The examination of seven approaches to SEA in section 4.6.1 has identified principles which are applicable to land use planning within a national planning framework e.g. the tiered EIS/EIA system, assessment of alternatives, integrated planning and assessment, assessment of cumulative impacts, development within carrying capacities, and the role of public participation. Beside these, there are also experiences of less formal forms of EIA for land use plans, which were termed 'Plan EIA' or 'EIA of Plan', before the term 'SEA' was popularised. The following paragraphs trace these examples, to identify approaches which are suitable for current approaches to land use planning. For ease of reference, the term 'Plan EIA' in the cases below are retained.

SEA and land use planning have two very important common characteristics; flexibility and adaptability. McDonic [1988] suggests two approaches for the use of EIA in the development plans system in the UK i.e. [1] structure/local/unitary development plans include policies which require EIA for certain types of major developments; and [2] structure/local/unitary development plans indicate where EIA will be required in development control policy guidance notes, and the like. However this approach does not comply with the conclusion made earlier i.e. SEA should be integrated within the planning process. McDonic's approach in simplified term is land use planning which *considers SEA* but not land use planning which *uses* SEA.

Jones [1983] gives examples of how EIA and land use plans are related to each other, in three approaches:

[1] *Parallel with the course of normal planning.* The EIA process is started in parallel with the planning process. The result is that *EIA refers to the plan*, but does not incorporate all the details of the plan, thus it is difficult to demonstrate how the consideration of the environment influences the choice or decisions in the plan. An example of this approach is the planning of the South Brabant Industrial Park in the Netherlands, where the EIA report is one of six reports for the structure plan. It is prepared outside the development of the plan, and only certain steps are parallel with the steps of the planning process [Jones 1983].

[2] *Within the planning process.* EIS is prepared as a separate chapter or document, as a descriptive vehicle showing the role of the environment in planning and decision-making. An example of this approach is the preparation of East Gelderland Regional [land use] Plan in the Netherlands. In this example EIA is integrated into the planning process from the formulation of objectives to alternatives and decision-making. Conclusions made by consultants are [1] the criteria for successful EIA is fulfilled by the existing planning process; and [2] the potential for expanding EIA beyond current definition of social and economic aspects is seen as an important future possibility [Jones 1983].

[3] *EIS represents the analysis of the alternatives.* This could be achieved if the environment is broadly enough defined in the planning process. The example of the Eastern Ontario Study is that of a 2-stage EIA process of the supply of electrical power; the first is the plan-stage and the second is the project-stage. The plan-stage EIA considers the "do-nothing" *alternative to* the proposal and *alternative methods* of carrying out the proposal. The EIA process in the plan-stage is referred to as a planning process, which considers the physical, social, economic and technical environments. The conclusion is that the approach meets the content-criteria of EIA and allows a general decision on broad alternatives to be taken before actual route selections.

A more integrated approach to the application of EIA in land use planning was suggested by Lee and Wood [1980]. The approach was further developed into three options [Foster 1985] as illustrated in Fig. 4.10.The three options are:

[1] EIA of a policy or plan [*Post formulation EIA*]; or

[2] EIA in policy or plan-making [*Integrated EIA*]; or

[3] Use of project EIA in policy or plan making [*Project Appraisal-Policy Review*]

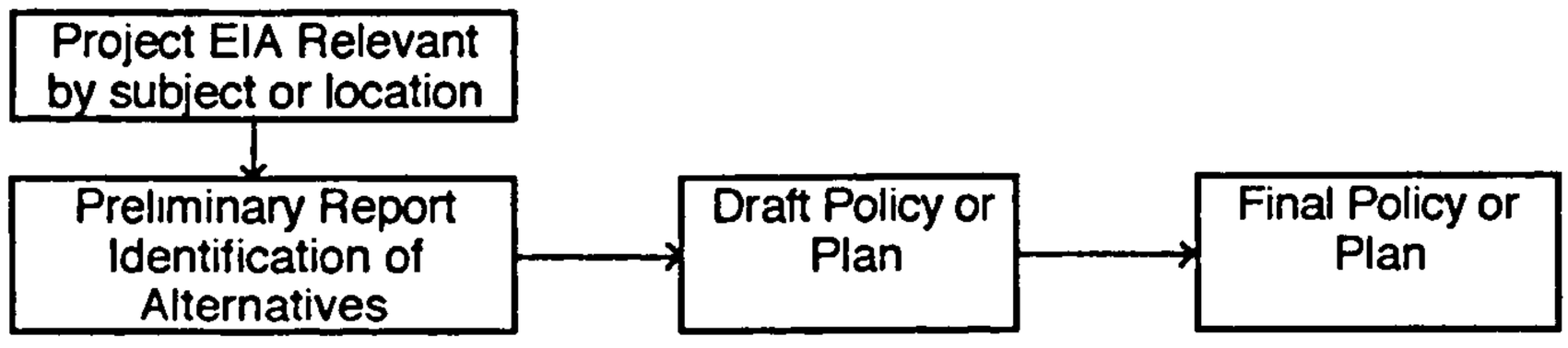
The second option i.e. EIA in policy or plan making is similar to the example of East Gelderland Regional [land use] Plan and complies with the framework for EIA in sustainable development. In this option it can be proactive, involved with the formulation of goals and objectives, and links planning, assessment and management. The first and second options still operate within the reactive nature of conventional project EIA and have the limitations of EIA in sustainable development which are identified in section 4.5.3. It is through no coincidence that the second option is consistent with the principles of SEA.

FIG. 4.10 : EIA IN POLICY AND PLAN-MAKING

[1] EIA of a Policy or Plan [Post formulation EIA]

[2] EIA in Policy or Plan Making [Integrated EIA]

[3] Use of Project EIA in Policy or Plan Making [Project Appraisal-Policy Review



Source: Foster, 1985.

Current examples of SEA approaches in land use planning

SEA as a formal approach has been attempted in the UK land use planning process, with varying levels of detail and methodological sophistication.

The Solihull Metropolitan Borough Council attempts an overall environmental assessment of its UDP [1990] and includes the Environmental Statement as a chapter in the Solihull UDP. According to the County Planner, the method involves the "identification of the broad considerations at the heart of the UDP, and the likely impact of its policies and proposals. No attempt has been made to undertake a detailed assessment of every proposal or to quantify or weight their impact upon the environment." [Personal communication 1991]. The broad assessment of the Plan follows separate policy headings [housing, economy, transportation, shopping, green belt, leisure and recreation, environment, minerals, and waste disposal], which are also the general strategies for the UDP i.e. to contribute positively to the environment. Although the method is 'broad-brush', it gives the Solihull Metropolitan Borough Council the confidence to propose more housing developments across the Borough, which is contrary to the Secretary of State's Strategic Planning Guidance, which suggests a four-stage process of housing development expansion which could extend into the Green Belt [Solihull UDP 1990].

The Kent County Council has not completed the comprehensive environmental audit of the County, but its Third Review of Kent Structure Plan is based on significant amounts of data available on land based resources and detailed knowledge on air quality , as well as on water quality and quantity [Kent County Council 1993]. The objective of the Review is that "the overall effect of the sum total of its policies reflects the concept of sustainable development." Therefore the SEA exercise, which is part of the Review, has been based on sustainable development criteria. The appraisal is based on DoE's PPG 12 [DoE.UK 1992a] and 'Policy Appraisal and the Environment' [DoE.UK 1991].

Kent County Council's strategy has been assessed against the environmental carrying capacity of the County, based on the evaluation of the structure plan policies. The policies are evaluated in terms of whether they have impacts on three groups of sustainability elements, in the form of a matrix. The sustainability elements are: local criteria [human beings, townscape, cultural heritage, noise, open space/access to the countryside]; countywide criteria [ecology, air quality, water, land/ground pollution, landscape]; and global sustainable development criteria [renewable natural resources, non-renewable natural resources, other renewable and non-renewable resources, energy conservation, atmospheric global change]. Each policy can be considered neutral if it will have no overall effect on the environment, positive if it leads to environmental improvement, or negative if it leads to environmental deterioration.

Kent's approach is admittedly "broad brush" [Kent County Council 1993], but it provides a good basis for more work on defining the environmental capacity of the County, and environmental assessments of local plans and land use allocations and projects. Its assessment of the plan in terms of sustainability criteria makes the approach more superior to that of Solihull.

The Lancashire County Council is more advanced in that it has used the environmental baseline study in 'Lancashire: A Green Audit' [Lancashire County Council 1991a], and its 'Better Environmental Practices Strategy' [Lancashire County Council 1991b], for the environmental appraisal of the 1986-1996 Structure Plan for the preparation of the Lancashire Structure Plan 1991-2006. The assessment has been done in the light of 'PPG' 12 - draft at that time [DoE 1992], and the technique is based on the guidance in the 'Policy Appraisal and the Environment' [DoE 1991]. The Green Audit contains data on the state of air and water resources and the use of energy that are not usually considered in the preparation of land use development plans. This fact has a strong bearing on the assessment approach, which is very strong on the environmental resource elements.

The principal tool is a matrix in which the 164 structure plan policy statements which are grouped into 13 areas form one axis, and the other is formed by the components of the

environment [receptors] that may be affected. There is no fixed rule on what is to be included in this axis, but the aim is to be comprehensive [Pinfield 1992]. The environmental components identified in the matrix are geology, soils, air, water, energy, land, wildlife, landscape, man-made features, open space, and human beings [Lancashire Country Council 1993].

The assessment method follows the principle set by the County Planning Officer's resolution that the revised Structure Plan should be "shifting the balance of priorities in determining land use questions to emphasise environmental considerations" and that the new Plan should seek to "ensure that the structure and arrangement of functions in the county areas promote environmentally sustainable economic development." [Pinfield 1992].

Criticisms against the technique include those which point that it is rudimentary, subjective and less rigorous than in project appraisal; there is no common unit of measurement; there is double counting due to overlaps between the environmental receptors chosen; there is no weighting; and benefits and dis-benefits to human beings are only taken into account where they arise from environmental factors. Advantages of the technique include the fact that it is simple to apply; fairly quick to perform; environmental assessment can be carried out in tandem with the overall appraisal of the Plan; consistently subjective since the evaluation is done by one person; and cost-saving since the work is done in-house.

Admittedly SEA cannot directly contribute to sustainable development but Lancashire County Council can be considered as successful in developing a method of land use planning that brings environmental considerations in at an early stage and incorporates them as a core element in decision-making.

4.6.5 Methodological difficulties

Generally four factors give rise to methodological difficulties in EIA i.e. deficiencies in assessment practice, incomplete data base, inherent elements of uncertainty in forecasting future situations, and incomplete technical knowledge. The greater complexity of PPP make these difficulties appear to be greater in SEA, due to the greater difficulties in determining the resource use and waste characteristics of developments and in predicting the impacts from multi-source developments; and the lack of development guidelines, checklists, matrices, advice notes, etc. These difficulties can be identified according to the stages in the plan preparation process [Table 4.8]. However some guidelines in the form of a classification system for EIA methods for physical plans have been prepared by Lee and Wood [1980] and presented in Table 4.9. The application of these methods in SEA depends on the type of PPP it is used for, and the procedure and the planning process.

TABLE 4.8: METHODOLOGICAL DIFFICULTIES RELATING TO THE EIA OF PLANS

Formulation of goals and objectives	Environmental planning goals are often insufficiently comprehensive and precise to enable EIA to contribute fully to plan generation and evaluation.
Survey prediction and analysis	Data gathering and processing varies widely. Often there are incomplete data, inadequacies in the sophistication of data analyses and forecasting environmental conditions as well as in presentation.
Generation and evaluation of alternative plans	Required content of land-use plans is often specified, in broad terms, in legislations. Environmental phenomena often only relate to traditional environmental aspects of land-use policy eg. protection of open spaces, nature,and conservation sites. Combined with Stages 1 and 2 these often result in insufficiently systematic use of environmental criteria in the generation and evaluation of alternative plans.
Decision, implementation and monitoring	Weights given to environmental as opposed to other factors in deciding upon the plan,and the extent of monitoring, vary substantially. However,where monitoring does occur, there is only limited evidence of monitoring of environmental impacts of of the plan.
Consultation and public participation	Consultation and public participation vary greatly between countries and type of plans. In a number of cases consultation takes place at too late a stage and/or is conducted on the basis of inadequate documentation to serve satisfactorily the purposes of an EIA system.

Source: Adapted from Lee and Wood 1980.

4.7 EIA IN DEVELOPING COUNTRIES

Active environmental movement in the developing countries only began ten years after NEPA of 1969 in the USA. The movement could be attributed to the globalisation of environmental issues made by industrialised countries, the result of international organizations such as the World Conservation Strategy of 1980, and their own experiences of man-induced ecological disasters. This was also due to the realization that in the long run it costs less to invest in environmental management than to face environmental disasters, for:

> "...developing countries often suffer more from adverse impacts created by development projects than in similar undertakings in developed countries...Faced with so many top priorities and constraints, developing countries cannot cope with normal day-to-day difficulties, let alone with sudden adverse impacts caused by development." [Thanh 1992 pp. 3-4]

Our Common Future [WCED 1987] later reaffirmed the message that past and current development strategies and practices which ignore the fundamental relations between environment and development may adversely affect their economic future. Consequently developing countries, some with the help of international organizations, have carried out a number of administrative, legislative and institutional reforms to promote environmental management strategies through three machineries, viz, resource evaluation and planning, pollution abatement and EIA.

TABLE 4.9: EXAMPLES OF METHODS FOR TASKS IN EIA OF PLANS

Tasks	Methods [examples only]
Stage 1: Formulation of goals and objectives	
Identify aspects of the environment to be studied, for which goals and objectives might be formulated.	Checklists.
Determine 'first-round' environmental goals and objectives	Environmental agency consultation to determine existing and planned environmental quality standards and targets; public consultation on basis of preliminary statement of planning issues.
Stage 2: Survey, prediction and analysis	
Identify aspects of existing environmental conditions for which information is to be sought.	Checklists.
Collate existing environmental data and identify gaps in information.	Consultation with specialists agencies, use of existing maps and aerial photographs, use of data collation and retrieval systems.
Obtain additional environmental data to meet remaining deficiencies. Identify gaps that cannot be satisfactorily filled.	Review and revision of existing monitoring systems, special surveys using a variety of techniques [aerial photography, field sampling, etc.]
Predict main social and economic changes over the planning period [assuming no new plans implementation].	Population and economic forecasting techniques applied to the planning area.
Predict physical resource use and waste generation levels associated with forecast economic/social changes.	Checklists and matrices for identification use. Resource and waste coefficient analyses.
Predict magnitude of impact on environmental quality.	Environmental agency consultation, screening procedures, resource depletion, diffusion and damage analysis, landscape assessment techniques.
Analyse future environmental conditions; compliance with 'first-round' environmental goals and objectives; review of goals and objectives.	Agency and public consultation on basis of survey report; mapping and overlay methods.
Stage 3: Generation and evaluation of alternative plans	
Develop alternative plans and determine environmental evaluation criteria.	Intuitive techniques. Delphi forecasting consultation. Trade-off, cost-benefit, goals achievement matrix analyses. Lists of standards.
Describe the relevant features of each plans and assess physical changes, changes in resource use and in waste generation associated with its implementation.	Checklists; resource and waste coefficient analyses; accident and uncertainty analysis.
Predict magnitude of environmental impact associated with plan implementation on: air, water and land [including mineral resources,] living receptors within the environment.	Checklists, consultation, screening procedures, resource depletion, diffusion and damage analysis, landscape assessment techniques.
Assess importance of impacts: determine compliance with environmental quality standards; investigate response of affected parties; aggregate environmental impacts.	Lists of standards, social surveys, public participation. Scaling and weighting systems, overlay methods.
Stage 4: Decision, implementation, monitoring	
Select plan for implementation	Application of evaluation criteria; agency consultation and public participation; plan modification in light of these.
Monitor environmental impact arising from plan implementation; review implementation process and replan.	Environmental monitoring systems.

Source: Lee and Wood 1980.

4.7.1 Legislative, institutional and procedural arrangements

To date only a relatively few developing countries have formally included EIA into their planning systems. Although many have EIA legislation, only nineteen out of 121 countries i.e. 15.7% have the necessary administrative, institutional and procedural frameworks for EIA implementation [Ebisemiju 1991]. The overall status is shown in Table 4.10 and the list of developing countries which have legislation and environmental agencies are listed in Table 4.11.

TABLE 4.10 : EIA STATUS IN DEVELOPING COUNTRIES

Region	Total number of Countries	Countries with EIA systems
Africa	52	-
Asia and Pacific	24	12
Caribbean	11	-
Latin America	20	7
Middle East	14	-
Total	121 [100%]	19 [16%]

Source: Ebisemiju 1991.

A comparative analysis of institutional arrangements for EIA implementation in seven developing countries by Ebisemiju [1991] presents a pattern of the situation which is considered as representative of most developing countries [Table 4.12]. The systems are mostly based on foreign EIA models which have been modified to suit local conditions, especially in the socio-cultural and political contexts, indigenous resources, and the long-established planning processes and development control mechanisms. Malaysia for instance has a system that has some of the characteristics of Canada's model, while Philippines and Thailand have guidelines that are similar in many respects to the USA model [Thanh 1983].

Three out of seven countries shown in Table 4.12, including Malaysia, have the Functionally Decentralised Model, in which the Environmental Agency only performs rule setting, review and monitoring functions. EIA functions are distributed away among the participants. It is only in Mexico that the environmental agency plays a centralized function. The contrast is in Korea, where EIA is controlled by a centralised lead agency. In China and Brazil on the other hand, the environmental agency performs rule setting, review and monitoring functions, while implementation is through provincial and local environmental agencies.

Procedures used in developing countries are generally more or less standardized and consist of basic steps of screening, initial environmental examination [IEE], scoping, impact statement preparation, review of final decision, monitoring and auditing. Most

countries review *projects* based on their potential environmental impacts, while PPPs in most cases are adopted and implemented without SEA or environmental assessment at all [Werner 1992].

TABLE 4.11: DEVELOPING COUNTRIES WITH ENVIRONMENTAL LEGISLATIONS AND AGENCIES

Country	Legislation	Environmental Agency
1 Argentina	In preparation	National Directorate of Environmental Planning, 1975
2 Bangladesh	-	Environmental Pollution Control Board
3 Brazil	National Environmental Policy Law 1982; CONAMA Resolution 001, 1986	The Special Environmental Agency [SEMA], 1982
4 China	Environmental Protection Law 1979	Environmental Protection Bureau [1979-1987] Environmental Protection Authority 1987
5 Columbia	National Code of Renewable Natural Resources and Protection of the Environment 1974	National Institute of Renewable Resources and the Environment [INDERENA] 1968
6 India	Environment [Protection] Act No 29, 1986	Department of the Environment [DOE]
7 Indonesia	Environmental Management Law 1982, Regulation PP No. 29, 1989	Ministry of Population and the Environment
8 Republic of Korea	Environmental Conservation Law 1977, 1979, 1981, 1982, 1983, 1986	Office of the Environment
9 Malaysia	Environmental Quality Act, 1974, 1985	Department of the Environment, [DOE], 1974
10 Mexico	Law of Public Works, 1980; Federal Law of Environment Protection, 1982	Ministry of Urban Development and Ecology [SEDUE]
11 Nepal	-	Environmental Impact Study Project [EISP]
12 Pakistan	Environmental Protection Ordinance No XXXVII 1983	Environmental Protection and Improvement Agency
13 Papua New Guinea	Environmental Planning Act, 1978	Department of Environment and Conservation 1978
14 Peru	-	National Office for Natural Resources Evaluation [ONERN] 1962
15 Philippines	Presidential Decrees 1211 and 1151 [1977], 1586 [1978], Proclamation No 1179 [1981]	National Environmental Protection Council [NEPC] 1977
16 Sri Lanka	National Environmental Acts 1980, 1984, 1986	National Environmental Authority
17 Thailand	Improvement and Conservation of National Environmental Quality Acts 1975, 1978	National Environmental Board [NEB]
18 Uruguay	-	National Institute for Environmental Preservation [INPMA] 1971
19 Venezuela	Organic Law of the Environment 1976	Ministry of Environment and Renewable Natural Resources [MARN] 1976

Source: Ebisemiju 1991

Although each country pursues an individualised approach to EIA, there are common elements among them. First, all of them use legislative rather than administrative measures to introduce EIA. This approach has its merit since most developing countries have low level of environmental awareness, high degrees of political instability, intense promotion of ethnic rather than national interests, and corruption. Second, there is the lack of or inadequate public involvement in the EIA process, especially in scoping and review, and the near-absence of judicial involvement. Third, there is the inability of environmental agencies to influence the course of decision-making and enforce compliance and the near-absence of monitoring. Fourth, most environmental agencies do not have much clout, authority and legal power because of their low status in governmental hierarchy, under-funding and inadequacy of skilled staff and facilities [Thanh 1983, Ebisemiju 1991, Bisset 1992, Thanh 1992].

TABLE 4.12 : INSTITUTIONAL ARRANGEMENTS FOR EIA IMPLEMENTATION

EIA ACTIVITIES	Philippines	Thailand	Korea	Malaysia	China	Mexico	Brazil
Rule setting	6	6	3	6	6	6	6
Screening	2	2	3	2	2	6	2
TOR/Scoping	2	2,6	3	2,4,6	1,2,4,5	6	8
Assessment	2	1	3	1/2	1/2	1/2	1
Review	7	6	6	7	7	6	6/7
Licensing	10	3,9	3	8	3	3	8
Monitoring	6	6	3	6	2,3,6	6	6
Type of Model	A	A	B	A	C	D	C

KEY:

A *Functionally Decentralised*: EIA functions are distributed among all participants. Environmental Agency has wide-ranging legal authority over EIA but only performs rule setting, review and monitoring functions.

B *Centralised in Lead Agency*: Lead Agency sets the procedural rules, and is also the project proponent, responsible agency, assessor and permitting agency.

C *Hierarchically Decentralised*: Environmental Agency only performs rule setting, review and monitoring functions. Implementation is through provincial and local environmental agencies.

D *Centralised in Environmental Agency*: All EIA activities, except for assessment and licensing, are concentrated in the environmental agency.

1 Consultant
2 Project proponent [public & private]
3 Lead/Responsible Authorising Agency
4 Concerned Agencies
5 The Public
6 Environmental Agency
7 Independent Review Committee
8 Federal, State, Local Authorities
9 Cabinet
10 President

Source: Ebisemiju 1991 [modified].

Political associations too play their role in promoting EIA in developing countries. The Association of Southeast Asian Nations [ASEAN] which comprises Brunei, Indonesia,

Malaysia, Philippines, Singapore and Thailand, for instance, has the ASEAN Environment programme [ASEP] which has many components, of which EIA is a major one. Afghanistan, Bangladesh, India, Iran, Maldives, Nepal, Pakistan and Sri Lanka are being assisted by the South Asia Co-operative Environment Programme [SACEP], while the Mekong Committee which comprises the Republic of Vietnam, the Khmer Republic, Laos and Thailand, under the aegis of ECAFE [United Nations Economic Commission for Asia and the Far East], has been instrumental in EIA progress within the region [Thanh 1983].

Bisset [1992], in devising an effective EIA system for the Turks and Caicos Islands, Werner [1992] in the study of EIA in developing countries during the last decade, and Thanh [1983 and 1992] in a study of EIA in Asian countries, identify problems of implementing EIA in developing countries generally. The most prominent problems are listed below:

- Lack of trained human resources. Sometimes EIA reports are not suitable for decision-making because they are too long, too descriptive, and insufficiently analytical;
- Lack of financial resources;
- Lack of information on environmental and social systems [baseline data];
- Low status of environmental departments or agencies in the institutional hierarchy;
- Limited public knowledge of EIA to ensure effective public participation;
- Lack of co-ordination between agencies at national / local levels;
- Lack of willingness of proponent agencies to internalize EIA requirements;
- Lack of precise role definition for the various participants in EIA procedures; and
- Lack of information exchange.

4.7.2 Balance between development and conservation

Most EIA legislation in developing countries, implicitly or explicitly, require the application of EIA at the planning stage so that development and environment can be integrated. However normally in practice, EIA is applied when decisions on a certain set of project options such as siting, raw material requirements and the type of processes to be employed, have been made [Htun 1988].

When discussing recommendations to enforce EIA in developing countries, questions like "is EIA anti- development?" [Ahmad and Sammy 1985] and "who is more important, man or monkey?" [Thanh 1992] usually arise. Thanh attributes this to the usual understanding of impacts to mean adverse impacts, and hence the seemingly lack of consideration and appreciation for the eradication of poverty and backwardness in the developing countries. Asit and Biswas [1992] call for the overall thrust of EIA to be shifted to

maximise positive environmental impacts and minimise adverse impacts rather than focusing exclusively on negative impacts. Perhaps that is one of the reasons why Barbier [1987] insists on the term *sustainable economic development* to be the guiding principle for developments in the third world countries, for following this principle, EIA should not be just a decision-making tool for the approval/disapproval of projects, but to be used as a planning tool in resource management leading to increasing the material standard of living of the poor.

4.7.3 Guidelines for the future

Many major EIA studies in developing countries are carried out or assisted by international aid agencies which include international organisations such as United Nations Economic Commission for Europe [UNECE], the Committee of International Development Institutions on the Environment [CIDIE], United Nations Environment Programme [UNEP] and World Health Organisation [WHO], or international agencies such as the Canadian International Development Agency [CIDA], Danish International Development Agency [DANIDA], Japan International Cooperation Agency [JICA], Norwegian Agency for International Development [NORAD], Overseas Development Administration [ODA] of the United Kingdom and the United States Agency for International Development [USAID].

Realizing the relationship between development and environment, these agencies have lately made it a requirement for an EIA to be carried out prior to the development of development projects which receive aid. These EIAs are carried out by donor agencies, or by the recipient countries with assistance from the donor-countries. However USAID is the only agency with a legal requirement for carrying out EIA [Kennedy 1992].

To improve EIA in developing countries, an ad hoc Group on Environmental Assessment and Development Assistance of the Organization for Economic and Development [OECD] had its first meeting on Oct. 1983 to identify ways to improve EIA in developing countries. To overcome the constraints, it was decided that developing countries and OECD countries should take steps to [1] overcome the lack of trained individuals , for example through Environmental Manpower Development project in Indonesia by the Canadian government; and [2] over forty "environmental profiles" of developing countries detailing the environmental situation and identifying critical areas of concern was carried out by USAAID and UNESCO's Man and the Biosphere Programme [OECD 1986].

Developing countries have realized the urgent need to incorporate environmental considerations into the development planning process [PPPs and projects]. The question is no longer whether it is valid and applicable, but how it can be operationally incorporated into the existing planning and management processes. That EIA can be viewed as one of several approaches available to achieve this objective was endorsed by The Expert Group Meeting

on Environmental Impact Assessment in Developing Countries, which was held in Guangzhou, People's Republic of China in March 1983 [Biswas and Geping 1987].

Experiences in the developing countries lead to the following conclusions and recommendations [Ahmad 1985, OECD 1986, Biswas and Geping 1987, Kennedy 1988, Asit and Biswas 1992, Bisset 1992, Scholten 1992, Thanh 1992, Werner 1992] :

1. EIA studies should identify environmental benefits and disbenefits of proposals [PPPs and projects], as well as its economic and environmental acceptability to the community;
2. EIA studies should include appropriate mitigation measures into the development action;
3. There should be identification of environmental problems which require further studies and/or monitoring, review and auditing;
4. There should be an examination of alternative courses of actions and the selection of optimal alternative from the various relevant options available;
5. There must be greater public involvement in the decision-making process related to the environment;
6. National and international governments must assist all parties involved in development and environmental affairs to understand their roles, responsibilities and overall relationships with one another; and
7. EIA methodologies should integrate within it risk analysis and SIA, requirements for climatic, social and cultural characteristics, and must be within available limited costs and expertise and reasonable timeframes.

4.8 CONCLUSIONS

This chapter has identified the philosophy and principles as well as salient features of EIA which led to the renewed interest in SEA. The limitations of poject-level EIA and the need for SEA for sustainable development are lessons that developing countries can learn from the developed countries. The examination of NEPA of the USA reveals that EIA was and is still meant for all types of actions, including policies, plans, programmes and projects. However, because of their different characteristics, EIA for projects necessarily differs from EIA for PPP.

A significant conclusion is that project-oriented EIA has limitations as a tool for sustainable development because it is reactive; overlooks impacts from ancillary developments; overlooks cumulative environmental effects and impacts, forecloses alternatives; does not look at objectives; carried out too late and ends too soon; looks at narrow spectrum of issues; and, because of these limitations, their outcomes are sometimes inconsistent with perceptions. To contribute more toward sustainable development, EIA has

to be anticipatory and preventive; problem-focussed and value-based; link policy, planning, assessment and management; focus on cumulative impacts; ensure that developments are within carrying capacities; increase public participation; and improve its content to accommodate impacts of long-term proposals and cumulative impacts.

As a remedy to its limitations, and to be more contributive to sustainable development, EIA should be applied to all levels of planning and decision-making. This principle has led to the development of SEA, in response to the Brundtland Committee's recommendation that EIA also be applied to PPPs, including major macroeconomic, financial, and sectoral policies that induce significant impacts on the environment. Integrating SEA into land use planning complies with the holistic planning approach, in which environmental factors are also considered when assessing social and economic components. Integrating it from the goal-formulation stage through the formulation and evaluation of alternative strategies ensures that potential impacts of final decisions are easier to evaluate.

Most developing countries face problems in EIA practice, particularly the lack of trained human resources, finance, baseline data, low status given to environmental agencies, and most pertinent of all, the lack of political will. However understanding the imperative link between development and conservation, and the needs for sustainable development, developing countries too have realized the need to incorporate SEA into the development planning process. The question is no longer whether it is valid and applicable, but how it can be operationally incorporated in the existing planning and management processes.

The examination of several approaches to SEA, particularly experience in SEA from the UK local planning authorities help to justify the proposal that SEA should be integrated into Malaysian land use planning. The identification of significant features from these examples will be considered in the process of developing proposals for Malaysia in Part 3.

Chapter 5

Planning for sustainable development

5.1 INTRODUCTION

Hall wrote in 1983: "Whether through the operation of market forces, governmental intervention or a combination of both, many of the basic resources of life promise to be more expensive, more hard to obtain, in 2000 than now ... Within the city there will be a much greater emphasis on rehabilitation and regeneration of the existing stock of buildings." [Hall 1983, p. 54]. Nearly ten years later the Rio Declaration on Environment and Development in 1992 echoes Hall's statement with two principles: "In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it." [Principle 4, UNCED 1992], and that "environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority." [Principle 17, UNCED 1992].

The examination of the prerequisites for sustainable development in Chapter 2 concludes that there is a need for rational planning of environmental resources over a very long term towards improving the quality of life and to keep development within the Earth's carrying capacity, and that environment must be integrated with economics in all levels of planning and decision-making. The examination of land use planning principles in Chapter 3 reveals that its flexible, multi-dimensional and multi-objective nature provides great opportunities for the integration of social, economic and environmental issues in determining the trend of development. However it also reveals one shortcoming in land use planning i.e. it does not have a formal systematic procedure for assessing environmental impacts, which is considered as imperative for sustainable development. The evaluation exercise also concludes that if land use planners are to perform their responsibility toward achieving sustainable development, land use planning instruments have to be strengthened by including within them systematic procedures for assessing environmental impacts.

The examination of EIA and SEA in Chapter 4 reaffirms that SEA can be applied to all levels and types of PPPs, and fits within the planning process so that overall societal goals are

achieved. Consistent with the focus of this thesis, this chapter examines several national planning approaches which could form frameworks for SEA. Some guidelines for planning and decision-making for sustainable development are examined in section 5.2, and several approaches to integrated environmental management are examined in section 5.3. To enable the development of proposals which are more realistic and consistent with the Malaysian context, the examination of planning approaches for sustainable development in this chapter especially refers to the Economic and Social Commission for Asia and the Pacific [ESCAP] Region. Reference made to other regions are on concepts which could be applied to the ESCAP region.

In section 5.4, the most salient features of land use planning, strategic environmental assessment and national integrated resource planning and management approaches that are suitable for developing countries are synthesized to provide coherent frameworks for incorporating SEA into a national planning system of a developing country.

5.2 PLANNING AND DECISION-MAKING GUIDELINES

Planning for sustainable development is a complex task, because there is no one commonly accepted or operational definition of sustainable development. Therefore there is no one 'correct' framework or model to base on. However sustainable development suggests that it is any form of planned change that can be maintained indefinitely. It can be termed as development that does not erode the ecological, social, or political systems upon which it is dependent. Therefore planning for sustainable development must acknowledge ecological constraints on the economy, and have the full support of the people. This in turn needs political and planning processes that are informed, open and fair.

In a research for CEARC, Bregha *et. al.* [1990] analyses the integration of environmental considerations into the policy-making process of four national policies and one local policy in Canada, and conclude that: "Policy integration can occur *vertically* from policies through to strategies, programmes and projects, and *horizontally* by including environmental considerations in policy formulation." [Bregha *et. al.* 1990, p.4]. The analysis concludes that there is no one method to ensure that governments effectively integrate environmental matters into their policy-making processes; but there is a need for a comprehensive effort, and the process must be flexible to suit different issues, sectors and levels of government. The study also raises difficult institutional, procedural and methodological issues, which could also be applied anywhere else. The following issues are quoted from the study report:

Scope: At what policy level should environmental factors be considered?

Responsibility: Who should be responsible for integrating environmental factors into policy?

Criteria: What environmental criteria should be applied in the formulation and assessment of policy?

Process: How should environmental considerations be incorporated into the overall process of governmental decision-making? Should it be legally entrenched?

Monitoring and Accountability: How should success be determined? What mechanisms are available to hold policy-makers accountable for the environmental implications of their policy choices?

Public Consultation: What is the place of public consultation in policy assessment?

Science, Information and Assessment Methodologies: How adequate are currently available information and analytical capabilities?

Answers to the above questions could form relevant criteria for developing a planning system, as well as a planning process, for any particular country, on condition that the answers are obtained within the context of that particular country. Part 2 [The Malaysian Framework] examines the Malaysian national and land use planning system, and its environmental policies and assessment procedures, to seek answers to the above questions. These answers form the basis for the proposals in Part 3.

5.2.1 Use of guiding principles

Sustainable development principles can be used as planning and decision-making criteria in resource planning and management. Gardner [1991] has grouped them into four *process-oriented* principles and four *substantive* principles which are related to four aspects of decision-making, i.e. ideology, analysis, strategy and organization [see Table 5.1]. The process-oriented principles are goal-seeking ideology, relational analysis, adaptive strategy, and interactive organizations. The substantive principles are satisfaction of human needs, maintenance of ecological integrity, achievement of equity and social justice, and provision of social self-determination and cultural diversity. While the process-oriented principles describe and define the structure, context and processes of decision, the substantive principles are value-oriented and describe the ends of decision-making.

These principles are to be as guidance when formulating PPPs for national development. However it is noted that the use of these principles are still to be tested and further research need to be done before they can be applied to the particular country that is using it. The most important criteria here is that these guiding principles must be developed with the country's national, ideological, political, social and economic framework, particularly its policies on environment and development.

TABLE 5.1 : GUIDING PRINCIPLES FOR PLANNING APPROACHES FOR SUSTAINABLE DEVELOPMENT

1. **Ideology:** Goal-seeking
   Process-oriented principles
   - 1a proactive, innovative, generates alternatives
   - 1b considers range of alternatives and impacts
   - 1c based on convergence of interests
   - 1d normative, policy-oriented, priority-setting

   Substantive principles
   - A1 quality of life and security of livelihood
   - B1 ecological processes and genetic diversity
   - C1 equitable access to resources, costs and benefits
   - D1 individual development and fulfilment, self-reliance

2. **Analysis:** Relational
   Process-oriented principles
   - 2a focused on key points of entry into a system
   - 2b recognizing linkages between systems and dynamics
   - 2c recognizing linkages within systems and dynamics
   - 2d importance of spatial and temporal scales

   Substantive principles
   - A2 development as qualitative change
   - B2 awareness of ecosystem requirements
   - C2 equity and justice within and between generations
   - D2 endogenous technology and ideas

3. **Strategy:** Adaptive
   Process-oriented principles
   - 3a experimental, learning, evolutionary, responsive
   - 3b anticipatory, preventative, dealing with uncertainty
   - 3c moderating, self-regulating, monitoring
   - 3d maintaining diversity and options for resilience

   Substantive principles
   - A3 [growth for] meeting a range of human needs
   - B3 maintenance, enhancement of ecosystems
   - C3 avoid ecological limits and associated inequity
   - D3 culturally-appropriate development

4. **Organization:** Interactive
   Process-oriented principles
   - 4a collaborative for the synthesis of solutions
   - 4b integration of management processes
   - 4c integration of societal, technical, and institutional interests
   - 4d participatory and consultative

   Substantive principles
   - A4 organizations must respond to societal change
   - B4 ecological principles guide decision-making
   - C4 democratic, political decision-making
   - D4 decision-making locally initiated, participatory

NOTES:
Ideology, Analysis, Strategy and Organization are aspects of decision-making.
Numbers and letters refer to:

Process-oriented principles	*Substantive principles*
1 Goal-oriented ideology	A Satisfaction of human needs
2 Relational analysis	B Maintenance of ecological integrity
3 Adaptive strategy	C Achievement of equity and social justice
4 Interactive organizations	D Provision of social self-determination & cultural diversity

Source: Gardner 1991.

5.2.2 Use of a checklist

The analysis of what constitutes sustainable development in Canada has led to the development of a preliminary checklist of sustainable criteria in the form of integrated indicators when making decisions on development or redevelopment [Sadler and Jacobs 1991]. The basic list elaborates the three themes of economic, ecological , and social/community sustainability and their policy and institutional integration in assessment and choice. This is a conceptual list which could be tested for applicability in a particular context.

The checklist [Table 5.2], and the guiding principles suggest that there is a need for sustainable development indicators to be developed for systems operating toward societal goals.

TABLE 5.2: A PRELIMINARY CHECKLIST OF SUSTAINABILITY CRITERIA

Economic Sustainability

Need for proposal? • Economic justifications? • How to meet human needs, improve net social welfare, or community well-being? • Full slate of benefits and costs; i.e., direct and secondary - monetarized, physical, and qualitative? • Economically efficient and viable?

Ecological Sustainability

Anticipated potentially significant or irreversible cumulative effects? • Extent of depletion of renewable resources or impair ecological integrity on local/regional/global scale? • Effect on, for example, nutrient recycling, soil capability, biomass, water quality? • Compensatory measures that can offset deteriorations in resource productivity or ecological capacity?

Social/Community Sustainability

Social/community rationale? • Extent of promotion of, for example, fair and equitable distribution of benefits and costs? • Maintenance of choice of lifestyles which take into account minority rights, and community aspirations, including those for self-reliance and self-determinations? • Who will be allowed to participate in the development, share in the benefits, or receive compensation for unavoidable impacts?

Policy and Institutional Integration

Key interdependencies among economic activity, natural processes, and social/cultural values? • Past, present and future changes [in relation to present trends] under different policy scenarios? • Spatial boundaries of inter-reactions best drawn; do they have local/ regional/global impacts and implications? • Policy, institutional, and technological options that are already or potentially available to manage these effects, including those which encourage greater efficiencies in the use of non-renewable resources or promote the transition from "hard" to "soft" energy approaches? • The extent the proposed planning/ assessment process identify substantive issues and their policy and institutional implications, suggest alternative actions for resolving problems, elaborate decisional criteria, and establish conditions for monitoring, auditing, and evaluating progress in each of these areas? • How will this process foster an adaptive approach to coping with scientific policy and technological uncertainty, changing values, and intra- and inter-generational equity? • Procedures to be followed to integrate economics, ecology, and ethics, trade-off science-based facts and cultural values, including those derived from traditional knowledge systems; and relate decision-making to the broader range of policy and management options?

Source: Jacobs and Sadler [eds.] 1991 [Summarised].

5.3 INTEGRATED PLANNING AND MANAGEMENT

Environmental management is defined as "the control and direction of human activities which have an effect upon the environment such that economic development is environmentally sound and sustainable." [Munro 1986, p. 25]. In a comment on Munro's definition, Beanlands [1986] says environmental management is more difficult than it seems, for:

> "Management theory has developed based on experience in the manufacturing and marketing sectors, which involve relatively small systems with components which are easily quantifiable ... In contrast ... natural systems are large, complex, interactive, and not readily quantifiable. Some of the components move of their own accord in uncontrolled and unpredictable ways within time and space boundaries which are difficult to define. When you add this to the problem of determining the 'goals of society' as your management objective, *the fundamental utility of applying traditional approaches and skills to environmental problems is called into question*," [Beanlands 1986, p. 35] - italics are for emphasis.

Redclift [1987] cautions that we do not exaggerate the importance of environmental planning and management in our own societies, for according to him "...The methods employed - land use planning, the costing of environmental losses, the development of priorities for species conservation - are reactive responses which have been developed to deal with the uncomfortable consequences of economic growth" [Redclift 1987, p.137]. His arguments are based on two principles: [1] it is impossible to arrive at the optimum mix of resource uses without preconceived, value-based criteria; and [2] most environmental management is corrective, rather than directive.

Bearing in mind Beanland's doubt over the viability of environmental management, and Redclift's caution on the principles of management, it is still conceivable that an approach of integrated environmental planning and management be developed and adopted. Many case studies have been carried out in the ESCAP and UNECE Regions, with the conclusion that with appropriate research and case studies within the context of the adopting country, this approach can be adapted and adopted [Ahmad and Müller 1982, UNCRD and UNEP 1987, ESCAP 1987].

5.3.1 Background to the ESCAP region

A brief examination of the ESCAP region provides the basis for integrated environmental planning and management that is recommended for the area. There are three major reasons for environmental concerns here, namely the rapid population growth [for example Karachi has a population growth of 6.5 % in 1987]; fast increase in economic activities which result in growing demand for resources; and production processes are becoming more capital and technology intensive, thus requiring more natural resources. These reasons point to the danger of depleting natural resources and declining standard of living, if no stringent

measures are taken [ESCAP 1987]. Pakistan for example, has two sets of problems; serious air, water and soil pollution in large urban centres; and explosive growth of population, causing denudation of resources and deficiency of basic services. A study by ESCAP concludes that "it is difficult to achieve the desired ecological balance, unless a rational, integrated and environmentally sound approach to development were adopted. It was imperative to integrate the environmental dimension in development planning, to enforce practical measures and to focus upon critical problems of the environment." [ESCAP 1987, p. 7].

One of the main recommendations by ESCAP is that development planning and management be guided by National Conservation Strategies which are developed within the framework of the World Conservation Strategy [Rennie 1987, Jalal 1987].

5.3.2 Recommended integrated environmental planning and management in the ESCAP Region

In principle this approach means "the inclusion of various factors and concerns for environmental protection into the development processes at the *national, regional and local levels.*" [Kumamoto 1987, p. 3]. This concept is based on the "explicit recognition of the interdependence between socio-economic dynamics and the physical conditions within which they operate." [Ahmad and Müller 1987, p. x]. The analysis of case studies in the ESCAP region conclude that there could be no single approach to integrated planning.

Reviewing a set of studies on Integrated Physical, Socio-Economic Planning and Environmental Planning for UNEP, Ahmad and Müller [1982] identify issues which need looking into by Senior Advisers to UNECE governments:

[1] *Concepts, frameworks and methodological problems of EIA*: Economic assessment of environmental damage, Social Cost-Benefit Analysis and Risk Analysis are among elements of EIA which require further elaboration;

[2] *Integrated planning and management of development and incorporation of EIA*: There is a need to determine how EIA may be placed within the framework of integrated planning and management at various phases and levels;

[3] *EIA of energy alternatives*: There is a need to look into EIA of alternative commercial-scale production and use patterns of selected new and renewable sources of energy, including biomass and solar radiation; and

[4] *EIA as an instrument for the resolution of transboundary environmental problems*: There is a need to look into the effectiveness of national procedures and international arrangements.

Solving the above issues is acknowledged to be a complex task which requires the environmental manager to recognize key factors which constrain activities, i.e. social, technical, political, legal, ecological and economic factors. The main principle therefore is that it requires multi-disciplinary knowledge and interdisciplinary technique [Müller 1987].

One approach in the integration of environmental considerations into the development process is through national planning from the viewpoint of an environmental policy, as in the Netherlands [Kumamoto 1987]. There are three dimensions to this approach:

[1] The overall national planning provides the general policy, directions and frameworks;

[2] National but sectoral planning in relation to spatial regions or spatial basic sectoral plans with the nature of a masterplan, or

[3] The infrastructure development plan of sectoral administration i.e. implementation plans such as the five-year programmes.

Many countries in the ESCAP region operate under national development plans prepared by national economic development bodies. Regional and local plans are required to be consistent with the national plans. Some countries have incorporated environmental and natural resource management policies and natural resource conservation, but many do not. However it is concluded that countries in the ESCAP region need the following concepts and measures of integration:

[1] A general planning strategy which is linked to regional and local plans;

[2] Development projects which are determined within the goals of environmental protection;

[3] EIA and citizen's monitoring system;

[4] Economic Cost-Benefit Analysis and environmental accounting systems being introduced into economic planning in an ad hoc manner;

[5] Environmental study, education and training, and awareness;

[6] Appropriate substantive and procedural legal tools such as the ability to sue or the freedom of information;

[7] Appropriate legal settlement measures for environmental conflicts and disputes through judicial, administrative or other means; and

[8] Integrated utilization planning of natural resources.

5.3.3 Environmental Planning and Management [EPM]

An analysis and evaluation of eight case studies on environmental planning and management in 1987 has resulted in a planning approach which is called Environmental Planning and Management [EPM] for the ESCAP Region. Varying in scale and levels of government the

case studies reflect the different types of management processes for each area. The case studies are the Second Industrial Estate Development Project of Iri, Republic of Korea; Regional Development Planning: the Philippines Experience; Metropolitan Development Planning: A Case Study of Bombay; Local and Regional Development: Example of Fiji; Environmental Management in Papua New Guinea; Development Planning: A Thai Experience; Economic Development and Environmental Management in Tanzania; and Environmental Management for Local and Regional Development: Mexico.

EPM is defined as "a programme of activities through which environmental considerations are incorporated into settlements [land use] planning and management [SPM]" [Eigen 1987, p. 300]. There are four distinguishing features of EPM:

[1] EPM is a continuous programme that makes inefficient one-time environmental studies for specific projects unnecessary;

[2] EPM activities are fully integrated with SPM activities on an on-going basis;

[3] EPM supports and strengthens SPM by helping to identify development opportunities and constraints, helping to formulate development policy, helping to determine the best means for implementing policy, and helping to coordinate among the actors in settlements development; and

[4] EPM is oriented to maximizing the benefits to settlements development that can be derived from environmental resources and to minimizing the damage to metropolitan development from environmental hazards.

The most significant characteristic of EPM is that it is most effective when implemented within a programme, the functions of which are: collecting and analysing information on the environment and related development activity; forming coordinated policies for environmental resource and hazards; and supporting the implementation of these policies through SPM activities. The EPM Programme, which works most effectively within Chandrasekhara's hierarchy of environmental management at the national, regional and local levels [Table 5.3], is diagrammatically presented in Fig. 5.1

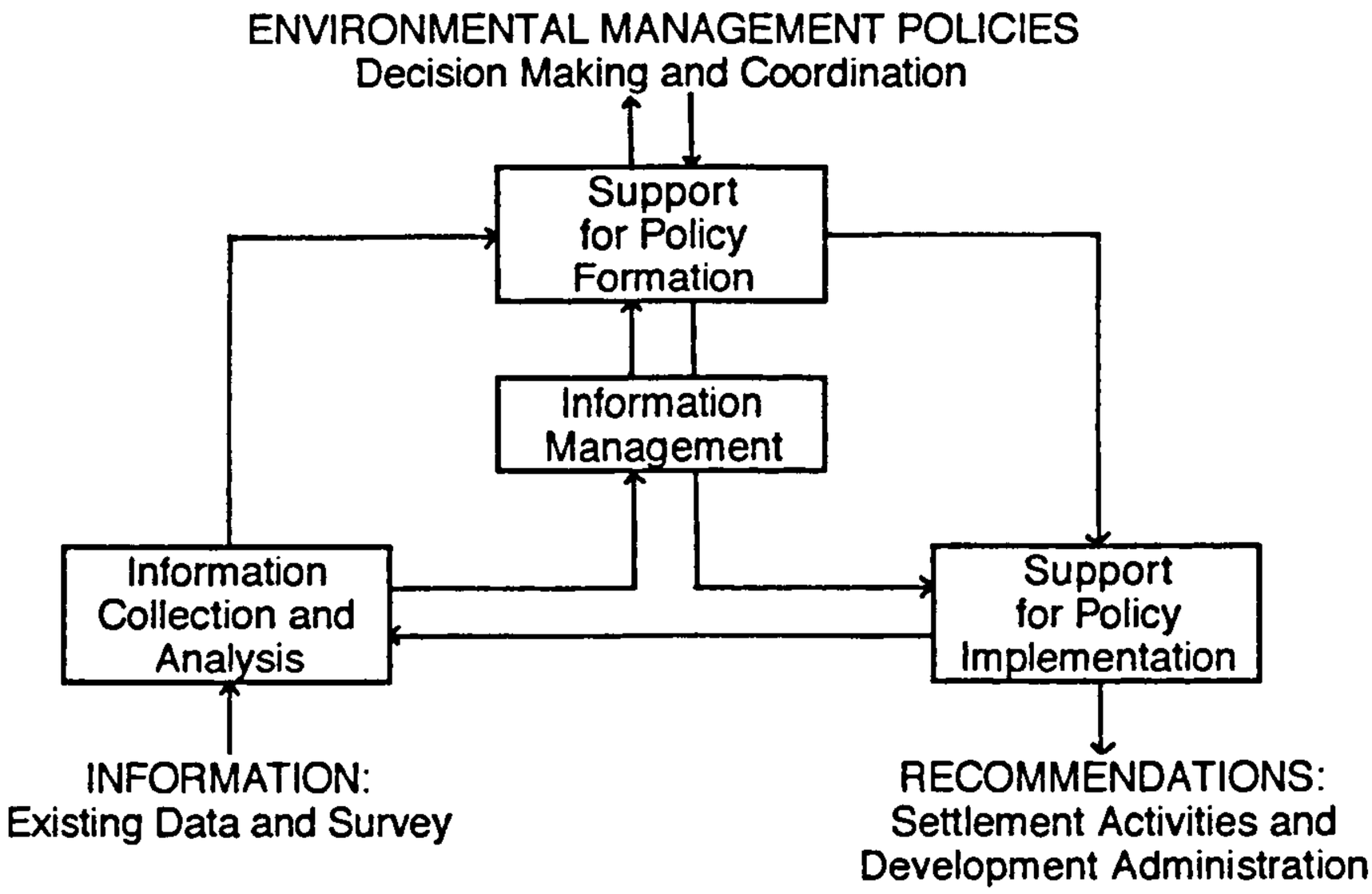
Fig. 5.1 shows the strategic importance of information management, which is commonly lacking in developing countries. To monitor sustainable development parameters, it is important that there is continuous information collection and analysis. The results are used for decision-making and coordination and for the development of environmental management policies. As the term 'management' goes, EPM is not a 'one-shot' exercise which is over once a plan is completed, but is a continuous cyclical process of environmental planning, monitoring and management, at the heart of which is information management.

TABLE 5.3: AN IDEALIZED ENVIRONMENTAL MANAGEMENT FRAMEWORK AT NATIONAL, REGIONAL AND LOCAL LEVELS

Level	Man - Nature Relationship	Resource Exploitation and Development Objectives	Institutional Framework and legal Support
I. MACRO: National Level	Nature Predominant; Macrolevel adjustment through resource transfers, transmigration, and long term conservation and preservation.	Sustained use of renewable resources; Resource substitutes to non-renewable resources safeguards against natural disasters; Improvement of economic wellbeing and living standards to a deliberately planned level.	National environmental agencies; National focal organisation for international environmental action; National environmental laws for conservation, protection, preservation, forestry, and land utili-sation, and pollution prevention and abatement.
II. MESO: Sub-national/ Regional Level	Man-Nature in equi-balance; Ecological approach to development of man-made goods and services; Limits to development so as to achieve congenial natural environment for human living.	Choice of alternatives in resource exploitation and development geared to conservation and preservation imperatives to maintain a balance between natural amenities and man-made goods and services; Maintenance of nationally determined living standards despite differences in the levels of economic prosperity.	State Agencies for environmental preservation and protection; State Laws for controlling quality for environment in urban areas and in the wider context.
III. MICRO Urban/Metropolitan Level	Man predominant as instrument of change; Limits to human activity so as to secure minimum level of natural amenities	Choice of alternatives limited to technological considerations to achieve efficiency and equity; Quality of Environment conducive to human living of low-income groups.	Urban environmental agencies especially dealing with human industrial and other wastes; Metropolitan environmental machinery; Local Laws pertaining to water, air, noise, and environmental pollution, vegetation and greenery, water bodies, etc.

Source: Chandrasekhara 1987.

FIG. 5.1: AN ENVIRONMENTAL PLANNING AND MANAGEMENT [EPM] PROGRAMME



Source: Eigen 1987.

Integrated environmental planning and management has included in it two integral components: land use planning and EIA. Since it has been established that EIA should be integrated within the formulation of policies, plans and programmes in general, and land use planning in particular, in the form of SEA, the discussion in this section is on land use planning and SEA within the integrated environmental planning and management structure.

5.4 SYNTHESIS OF CONCEPTS

Integrating SEA within the land use planning system, which in turn is integrated within the national environmental planning and management system requires specific operational features in order for the system to function effectively. The concepts so far examined are ideal within their own spheres, yet to be modified or adapted to fit into an individual country's framework. They have to be examined within the context of individual countries. Whether or not they can be operational will depend on many factors unique to each country.

The fundamental operational features of SEA, land use planning and Environmental Planning and Management [EPM] are summarised below:

Land use planning

- Land use planning works most effectively within a national strategic planning framework for planning for national social and economic changes;

- To be more effective, there is a need for a hierarchy of land use plans, one type for each level of the strategic planning framework;
- Land use plans are more effective in a national integrated planning system, in which environmental, economic, social and cultural factors are considered in an integrated process;
- An effective land use planning has a systematic procedure for assessing environmental impacts of land use proposals;
- Information management is of strategic importance for planning; and
- Formulating, evaluating and selecting alternatives are important steps in the planning process.

Strategic Environmental Assessment [SEA]

- SEA works effectively within a tiered assessment structure, so that there is a systematic environmental impact assessment of policies, plans and programmes;
- SEA is most effective when it is integrated within the planning process; and
- SEA process is developed from the EIA process which is suited to the particularly planning process.

Environmental planning and management [EPM]

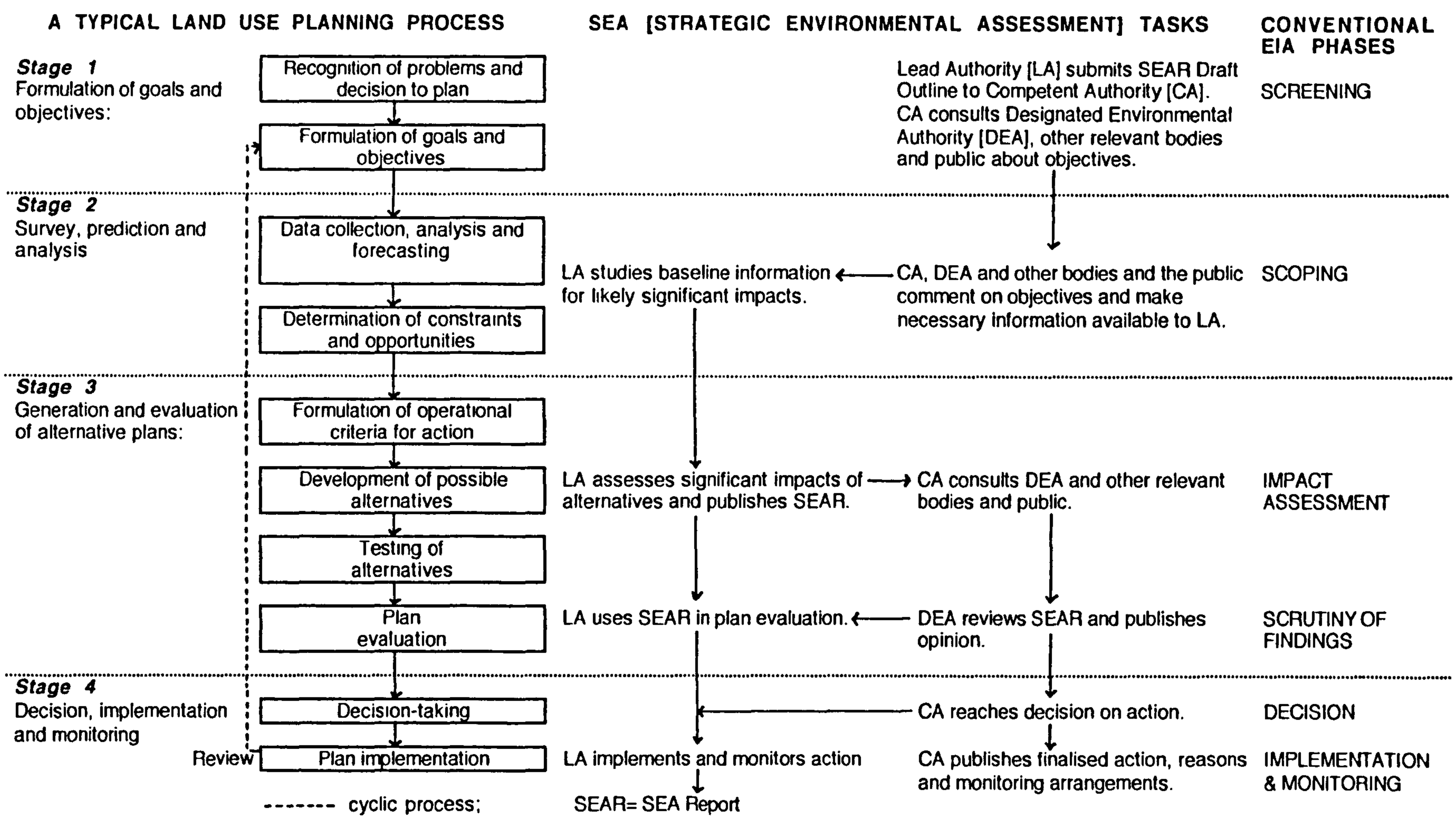
- EPM is a continuous programme;
- EPM supports and strengthens land use planning; and
- Information management is central to EPM.

The above fundamental features of the three concepts are combined to provide conceptual frameworks for a national planning system for sustainable development [see Fig. 5.2], and idealized frameworks for SEA within a typical land use planning process [see Fig. 5.3]. These frameworks will be tested against Malaysian national planning, land use planning and environmental impact assessment systems, to identify salient features, strengths and shortcomings in her political-institutional frameworks. These will be the basis for the development of the proposals in Part 3.

FIG. 5.2: CONCEPTUAL FRAMEWORKS FOR A NATIONAL INTEGRATED PLANNING SYSTEM FOR SUSTAINABLE DEVELOPMENT

IDEALISED STRATEGIC PLANNING FRAMEWORK	NATIONAL INTEGRATED DEVELOPMENT PLANNING SYSTEM	LAND USE PLANNING	STRATEGIC ENVIRONMENTAL ASSESSMENT	PROJECT EIA
Level 1: National objectives and policies [Sustainable development policy]	NATIONAL DEVELOPMENT PLAN/POLICY Translating national policies to regional strategies& policies Assessment of sustainable resource management	National Land Use Policy	Policy/Plan SEA [National Level]	
Level 2: Regional/sub-regional strategies/ [Resource Allocation and Integration]	general guidance MACRO-SCALE RESOURCE MANAGEMENT PLAN Strategy of action: objectives, strategies, policies, programmes Assessment of spatial environmental [ecological benefits]	Regional/Sub-Regional Strategic Land Use Plan	Policy/Plan SEA [Regional/Sub-regional Level]	
Level 3: Local implications [Impact Minimisation]	LAND USE / PHYSICAL DEVELOPMENT PLAN provides framework Ways of implementing environmental change for sustainable development Conditions and predispositions [environmental suitability]	Local Land Use Plan	Plan/Programme SEA [Local Level]	
Level 4: Resource allocation [Resource Management]	LOCAL RESOURCE MANAGEMENT PLAN Coordination & control of investments into physical development Monitoring achievement of sustainable development	Local Resource Allocation Plans	Programme SEA [Local Level]	Project EIA
Level 5: Implementation	IMPLEMENTATION, MONITORING AND AUDITING PLAN	Implementation/Monitoring/Review	Monitoring/Review/ Auditing	Monitoring/ Review/ Auditing

FIG. 5.3: IDEALIZED CONCEPTUAL FRAMEWORKS FOR A STRATEGIC ENVIRONMENTAL ASSESSMENT [SEA] WITHIN A TYPICAL SIMPLIFIED LAND USE PLANNING PROCESS



Chapter 6

Key conceptual issues

The examination of sustainable development principles, land use planning and Environmental Impact Assessment/Strategic Environmental Assessment [SEA/EIA] in Chapters 2, 3 and 4 respectively, and the review of planning approaches for sustainable development in the ESCAP region in Chapter 5, has identified issues which justify the thesis that SEA should and can be integrated within national and land use planning. The review of EIA systems in developing countries and the development of planning models for countries in the ESCAP region has brought the analysis closer to Malaysia, for which a proposal is made to integrate SEA within its national and land use planning systems.

The previous chapters have identified conceptual, legislative, institutional, administrative, procedural and methodological frameworks for planning towards sustainable development. These have been synthesized into idealized conceptual frameworks which are illustrated in Fig. 5.2 and Fig. 5.3 in Chapter 5. These illustrations are interpretations of conceptual frameworks for an idealized national integrated planning system for sustainable development, and the conceptual framework for an idealized strategic environmental assessment [SEA] within a typical land use planning process.

The key conceptual issues, as they are called here, help to justify and form the basis for the development of an ideal system of national development planning towards social and economic objectives within a sustainable society, as well as provide the framework for integrating SEA within the land use planning process for Malaysia. These issues will be analysed further in Part 2 [The Malaysian Framework], to assess Malaysia's capability to include within its planning system the idealized frameworks identified here.

The key issues are grouped according to the six instruments for environmental action identified by UNEP: national planning system; land use planning system; environmental assessment; legislation and environmental law; institutions and training; and consultation and public participation.

THE KEY CONCEPTUAL ISSUES

A. NATIONAL PLANNING SYSTEM

1. *Need for a National Integrated Planning System*

   For sustainable development, ideally planning, assessment and resource management should be within a national integrated planning system which follows the strategic planning process. The system integrates within it linkages between all levels of governments and planning, and determines a tiered system of plans and environmental assessment procedures.

2. *National Development Plan which aims for sustainable development*

   National Development Plan ideally should be based on long term rational planning of environmental resources, and define and include within it national environmental policies and objectives, and allocation of investment resources which reflect a sensitivity to environmental constraints and objectives. The Plan provides general policies, directions and framework for all plans in the hierarchy at all levels of decision-making.

3. *National Planning which aims for a sustainable society*

   The planning philosophy should adopt a definition of development which is people-centred and conservation-based i.e. development which improves the quality of human life while living within the carrying capacity of supporting ecosystems.

4. *Integration of Environment and Economics in all planning and decision-making*

   The environment ideally should be integrated with economics in all levels and types of planning and decision-making. Sectoral ministries and departments must apply SEA/EIA and cost-benefit analyses in decision-making.

B. LAND USE PLANNING SYSTEM

5. *Plan within a Strategic Planning Framework*

   Land use planning as the management of environmental change is most effective when prepared within a strategic planning framework which aims towards social and economic changes. This framework is contained in the national integrated planning system, which also determines the hierarchy of land use plans for the country.

6. *Plan for sustainable development*

   Land use plans, while aiming for social and economic goals, should be environment-led, and include environmental resource management.

7. *Imperative to have alternative proposals*

   Planning towards, and consideration of alternatives is important in determining the best possible course of action in terms of physical and human resources.

8. *Integration of planning and environmental impact assessment*

   Land use planning should include within it the formally prescribed systematic procedure for assessing environmental impacts in the form of a hierarchy of SEA/EIA. This procedure is to be used for formulating, reviewing and auditing of proposals which may lead to policy and institutional adaptation.

9. *Rational activity distribution*

   Operating within a complex process of planning, assessment and management, there is a crucial need for determining the scope of activities; criteria for planning, assessment and management; monitoring procedures; system of accountability; effective public participation; information exchanges and planning and assessment methodologies

10. *Adoption of new planning approaches for the 1990s*

    Planning should accommodate concepts such as the city as the engine of economic development; development which is environmentally-conscious; balance between needs and resources; protection of and enabling the poor; effective participatory approach; planning as a part of the urban management system; and an institutional framework for planning.

11. *Adoption of the rational planning model*

    For sustainable development, the planning process in the rational planning model is the most practical in terms of planning and decision-making activities, since this approach adopts planning by creating a desired future.

12. *Integration of SEA into the planning process*

    Integrating SEA into land use planning complies with the holistic planning approach, in which environmental factors are also considered when assessing social and economic components. Integrating it from the goal-formulation stage through the formulation and evaluation of alternative strategies ensures that potential impacts of final decisions are easier to evaluate.

C. ASSESSMENT OF ENVIRONMENTAL IMPACTS

13. *SEA within the decision-making process*

Decision makers are responsible over the impacts of their decisions upon the environmental resources capital, and hence it is imperative that the decision-making process includes environmental impact assessment.

14. *The comprehensive definition of 'environment'*

'Environment' to be assessed for impacts of development includes the biophysical, socio-economic, spiritual and cultural elements, and their interactions.

15. *Modification of EIA concept within the sustainable development framework*

EIA as a concept contributes more to sustainable development if it moves from react and cure to anticipate and prevent; is more value-based; link policy, planning, assessment and management; focus on cumulative impacts; and ensure that development is within the Earth's carrying capacity.

16. *Adoption of the SEA concept within the National Planning System*

Environmental assessment activities which follows the SEA procedure is effectively functionable within an integrated national planning and environmental assessment system.

D. LEGISLATION AND ENVIRONMENTAL LAW

17. *Effective legislative framework for SEA*

The effectiveness of SEA as an environmental management and planning tool depends on legislative, as well as complementary institutional and procedural arrangements which form the framework for SEA within the respective country.

18. *Effective legislation for environmental standards*

There should be more legislation to implement environmental standards.

19. *Complementary environmental assessment, planning and management legislation*

Environmental assessment, planning and management legislation should complement and support each other for a common goal.

E. INSTITUTIONS AND TRAINING

20. *Complementary internal environmental assessment procedures by government departments*

Sectoral policy-formulation and activities should have internalised consideration of the environment. Essential functions of institutions should include planning and incentives; environmental assessment; legislative and regulatory advice; awareness building and training; and research to improve planning, assessment and management of resources.

21. *Programme to overcome institutional and resource deficiencies*

For effective planning, assessment and management, there must be ways to overcome deficiencies such as the lack of trained human resources; financial resources; lack of information on environmental and social systems; low status of planning and environmental departments; and the lack of information exchange. Scope for improvements could be looked for at the community, local, regional, national and international levels.

F. CONSULTATION AND PUBLIC PARTICIPATION

22. *Effective Public awareness improvement programme*

For effective public participation in planning, there must be comprehensive programmes to increase public awareness and participation at community level, national and global non-governmental organizations, scientific bodies, schools and universities, mass media and governments.

23. *Effective Public participation programme*

The planning process should have more stages for informal and formal consultation and public participation. Public participation needs to be seen as a part of the decision-taking process rather than as a process which will eventually lead to agreed and acceptable decisions.

Part 2

The Malaysian Framework

Introduction to Part 2

The examination in Part 1 of the conceptual framework for integrating Strategic Environmental Assessment into the land use planning process has resulted in the identification of several key issues that need to be addressed before the concept can be effectively integrated within a particular political, legislative and institutional framework. These key issues also formed the basis for the conceptual proposals for an idealised national integrated planning system for sustainable development [Fig. 5.2], and an idealised strategic environmental assessment within a typical land use planning process [Fig. 5.3].

Part 2 examines these twenty-three key issues within the Malaysian framework. The aim of this examination is to assess Malaysia's potential for adopting the conceptual proposal formulated in Part 1, by means of highlighting the strengths and weakness in the Malaysian political, institutional, legislative and administrative frameworks of its planning and environmental impact assessment systems. It would be ideal to examine these frameworks in order of the key issues, but because of their interrelated nature, the examination is made according to conventional topics of: Malaysian National Planning System - Chapter 7; Malaysian Land Use Planning System - Chapter 8; Malaysian EIA System - Chapter 9; and Malaysian Key Issues - Chapter 10.

Assessments with regard to the key conceptual issues are made throughout the chapters, while the concluding assessment is made in Chapter 10. As stated in Chapter 1, the outcome of the examination of the Malaysian framework in Part 2 forms the basis for the proposal in Part 3.

Chapter 7

Malaysian national planning system

7.1 INTRODUCTION

Since this thesis is concerned with integrating Strategic Environmental Assessment [SEA] into Malaysian land use planning, it is vital to examine the Malaysian national planning system, for this forms the framework which determines whether or not the current land use planning system can accommodate new elements. With the above stand, this chapter examines the Malaysian planning system and identifies several issues that need to be addressed before any addition or change[s] is/are made to the system, if at all necessary.

The chapter first examines Malaysia's socio-economic framework, political-administrative system and political-economic history, before analysing the national planning system within the framework of strategic planning and implementation in the public sector. This is important in order to understand its planning ideology, policies, strategies and system. The examination of the land use planning system within the national planning framework is important when assessing the role of land use planning as the management of environmental change, and its role in achieving sustainable development in Chapter 8.

The examination of Malaysia's environmental planning and management identifies its development approach; environmental strategies, policies, laws and administrative machinery; its stand with regards to the relation between environment and development, and its strategies for sustainable development. The identification of environmental issues is to highlight the challenges that Malaysia is facing in environmental planning and management. These examinations will highlight the key issues in the proposal for the integration of SEA into Malaysian land use planning.

7.2 POLITICAL-IDEOLOGICAL FRAMEWORK

7.2.1 Introduction

Current development strategies, policies and planning ideologies of Malaysia have their roots in the past and present development pattern and issues which needed immediate solution then and still require constant attention today. They are also defined by its political-administrative framework and the political-economic history which moulded its development. This section explains these frameworks.

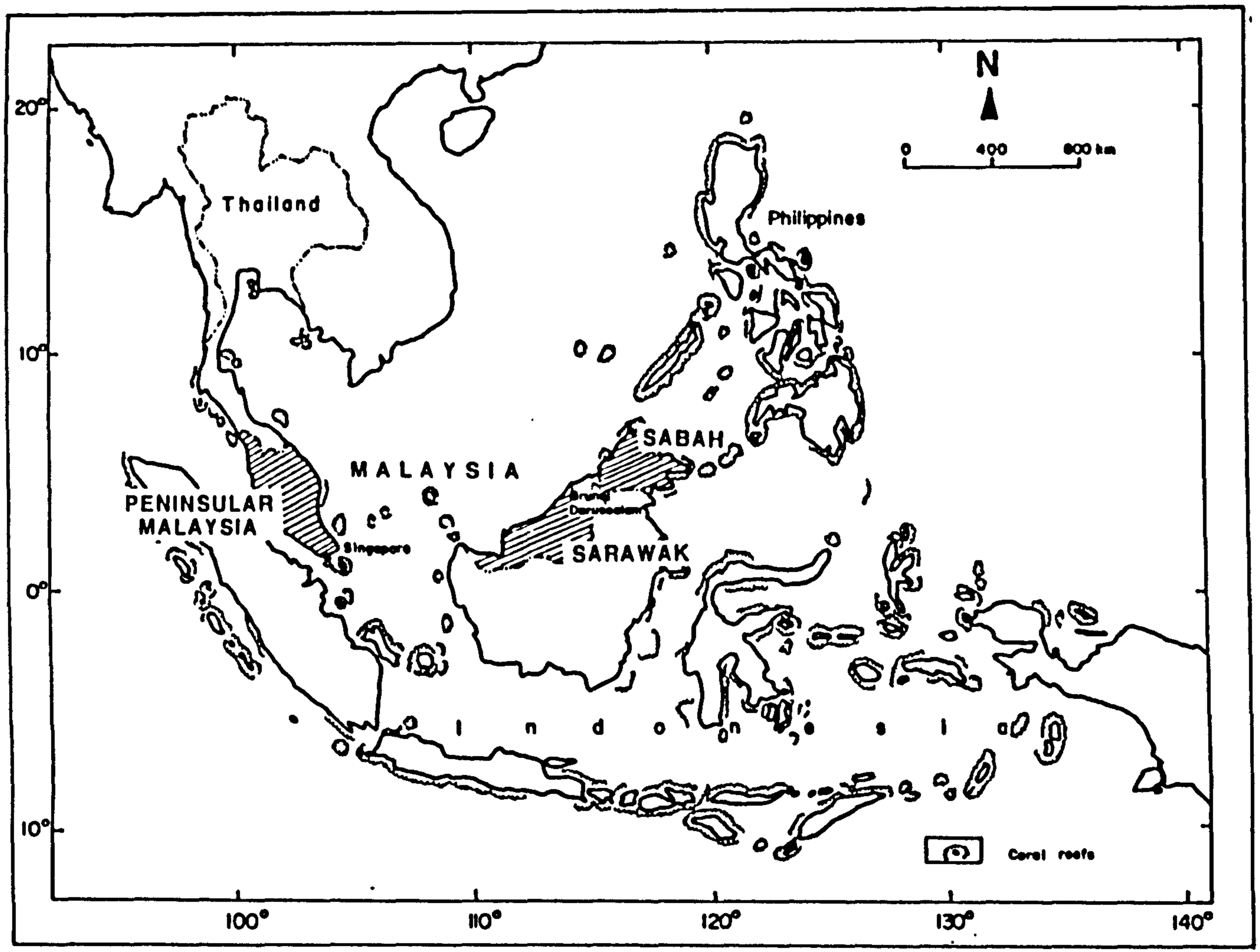
7.2.2 Geographical and socio-economic framework

Malaysia is located in the South East Asian region to the south of Thailand, and between Indonesia, Singapore and the Philippines [Maps A and B]. Its 329,758 sq. Km. area is divided into Peninsular Malaysia [131,598 sq. Km.] to the south of Thailand, and Sabah [73,711 sq. Km.] and Sarawak [131,449 sq. Km.] on the island of Borneo bordering Indonesia and Brunei. According to 1992 statistics, 82.1 % of its 18.6 million people were found in Peninsular Malaysia, while 9.4 % were in Sarawak and the rest in Sabah [Malaysian Economic Report 1991/92]. When compared to the proportion of the land area i.e. 39.91 % in Peninsular Malaysia, 37.74 % in Sarawak and 22.35 % in Sabah, the uneven geographical distribution of population is apparent. While the 1992 population density in Sabah was 21.4 persons per sq.Km., and 13.9 persons per sq.Km. in Sarawak, it was 141.3 persons per sq.Km. in Peninsular Malaysia [Table 7.1].

Malaysia has a multi-ethnic population, but it is dominated by three major groups, namely Malays [58.3 %], Chinese [31.3 %] and Indians [9.8 %]. Malaysia is proud to claim to have a happy and harmonious multi-ethnic society; but the general distribution pattern of these ethnic groups can be generally traced to a geographical pattern which is related to the economic activities pattern. The significance of this phenomenon is explained later.

The annual employment figures in the three main economic sectors show a rapid shift in economic emphasis. While there is a decrease of employment in the agricultural sector, and a very slow increase in the government sector, there is a sharp growth in the manufacturing sector [Table 7.1]. This reflects a nation that is fast shifting from having a predominantly agricultural economy to being an industrial nation [OPP2 1991-2000].

MAP A: MALAYSIA: THE GEOGRAPHICAL LOCATION



MAP B: STATES IN PENINSULAR MALAYSIA

TABLE 7.1: MALAYSIA: BASIC DATA

AREA	[Sq. Km.]					
Peninsular Malaysia	131,598 [39.91 %]					
Sabah	73,711 [22.35 %]					
Sarawak	124,449 [37.74 %]					
Malaysia [Total]	329,758 [100 %]					
POPULATION	1990		1991		1992	
	Million		Million		Million	
Malaysia	17.76		18.17		18.60	
Peninsular Malaysia	14.62		14.94		15.27	
Malays	8.52 [58.2 %]		-		-	
Chinese	4.58 [31.3 %]		-		-	
Indians	1.44 [09.8 %]		-		-	
Others	0.09 [00.7 %]		-		-	
Sarawak	01.67		01.71		01.74	
Sabah	01.47		01.53		01.58	
	£ million	% growth	£ million	% growth	£ million	% growth
NATIONAL PRODUCT						
GNP in constant 1978 prices	20,489	11.5	22,316	08.9	24,377	09.2
Per capita GNP [1991 prices]	1,669	12.2	1,833	09.8	2,001	09.2
DOMESTIC PRODUCT						
GDP in constant 1978 prices	21,393	09 8	23,222	08 6	25,206	08.5
		%		%		%
	'000	growth	'000	growth	'000	growth
LABOUR						
Labour Force	7,046.5	3.1	7,257.9	3.0	7,461.1	2.8
Employment						
Total	6,621.0	4.3	6,848.9	3.4	7,060.1	3.1
Agriculture	1,837.6	- 0.7	1,834.1	- 0.2	1,832.1	- 0.1
Manufacturing	1,290.2	10.2	1,374.1	6.5	1,448.1	5.4
Government	850.2	0.4	853.9	0.4	858.5	0.5
Unemployment[% of labour		6 0				5 4
	%		%		%	
INCIDENCE OF POVERY						
Peninsular Malaysia	15.0		-		-	
Rural	19.3		-		-	
Urban	07.3		-		-	
Sabah	34.3		-		-	
Rural	39.1		-		-	
Urban	14.7		-		-	
Sarawak	21.0		-		-	
Rural	24.7		-		-	
Urban	04.9		-		-	
MALAYSIA	17.1		-		-	
Rural	21.8		-		-	
Urban	07.5		-		-	

Source: Malaysia Economic Report 1991/92
Sixth Malaysia Plan 1991-1995

7.2.3 Political-administrative system

Malaysia is made up of thirteen states; eleven are in Peninsular Malaysia, while the twelfth and thirteenth are Sabah and Sarawak respectively. The political-administrative organisational hierarchy in Peninsular Malaysia is shown in Fig. 7.1. Malaysia as a whole is under a Federal Constitutional Monarchy system of government, headed by a constitutional monarch.

The Federal Government is headed by the *Prime Minister* who is the head of the *Federal Cabinet*. The State Governments are made up of *State Executive Councillors*, normally termed as *State EXCOs*, and headed by *Menteri Besar* [Chief Ministers] who are elected politicians appointed by the Prime Minister. The State EXCOs are appointed from members of the *State Legislative Assemblies* of the respective states. This state of affair explains the strong influence of the Federal Government over the State and local governments.

Each state is administratively divided into *Daerah* [Districts] under the administration of *Pegawai Daerah* [District Officers] who are civil servants under the direct responsibility of the *Setiausaha Kerajaan Negeri* [State Secretaries] [Map B]. Each district is further divided into *Local Authorities*. Each district could comprise one local authority, or more, within its area, but usually not more than two, and not necessarily covering its whole area. A typical administrative structure in each state is illustrated in Map C. It is only in three states [Kedah, Pulau Pinang and Melaka] that each local authority covers the whole district. As local authorities are governed by their own legislation, this structure is complicated although in most cases, the Presidents of the local authorities are also the district officers. The exceptions are the Municipalities whose presidents are normally the Chief Ministers of the states. This state of affairs, in simplified terms, explains the administrative complexity of national, state and local administrative links. These links are further examined later.

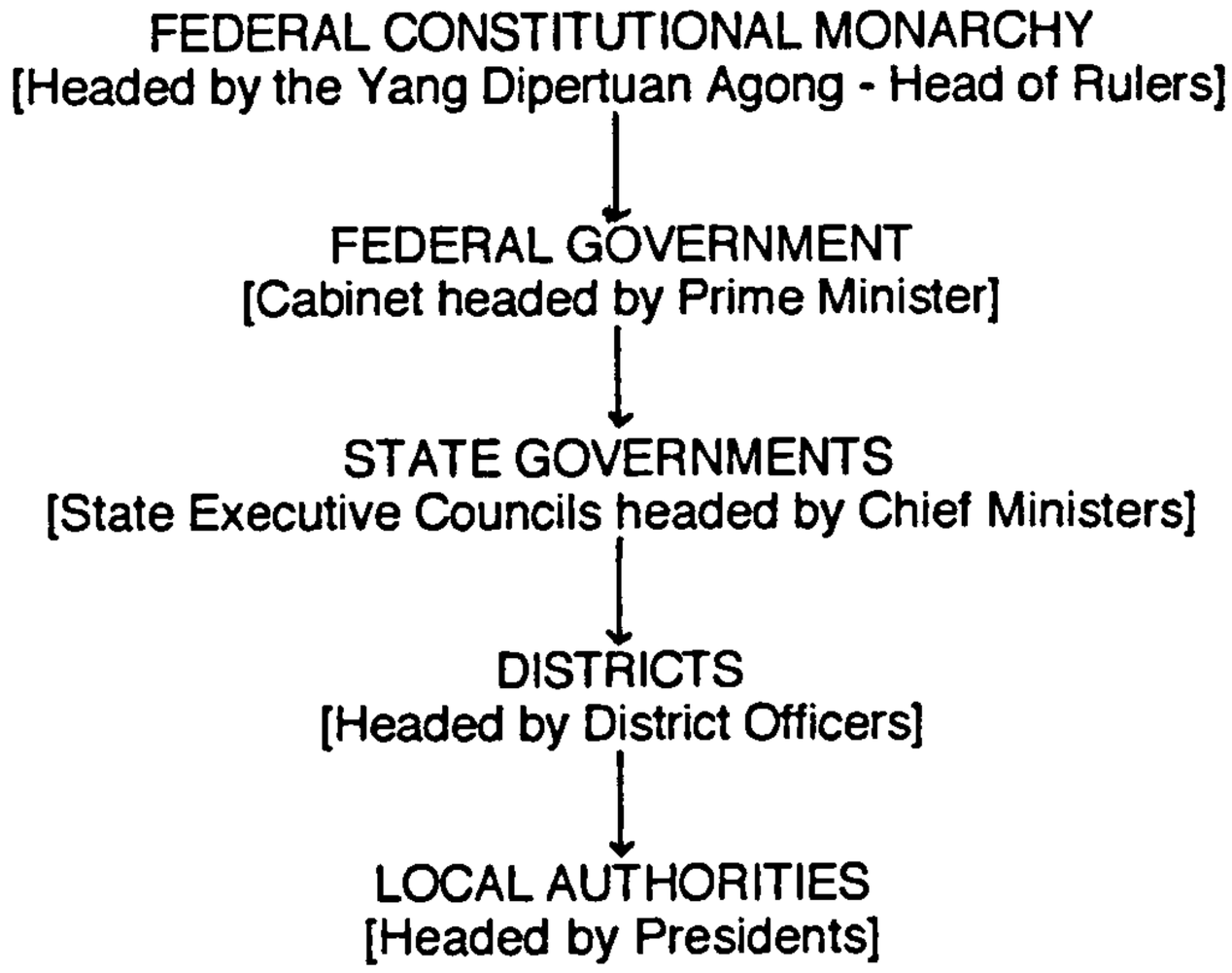
7.2.4 Political-economic history

Peninsular Malaysia [Malaya then] was ruled by the Malay *Sultans*, while Sabah and Sarawak were ruled by tribal leaders before they became British colonies in the nineteenth century. British rule over Malaya was interrupted by the Japanese Occupation between 1942-1945 and then resumed until 1957 when Malaya gained its independence. British rule over Sabah and Sarawak lasted until 1965 when the two joined Malaya to form Malaysia. These relatively recent historical events indicate a relatively "young" Malaysia.

British rule changed the socio-economic and political structure of Malaya [Lim *et. al.* 1990]. British influence is found in the political-administrative system which, in many ways,

mirrors the British political system. Examples include the Constitutional Monarchy system, Parliamentary system, and the administrative system. These influences are found even after independence. Very prominent in relation to land use planning is the planning act which adopts the British system of structure planning in local planning authority areas [Azman 1984, Bruton [undated] 1987, Lee *et. al.* 1990, Goh 1991].

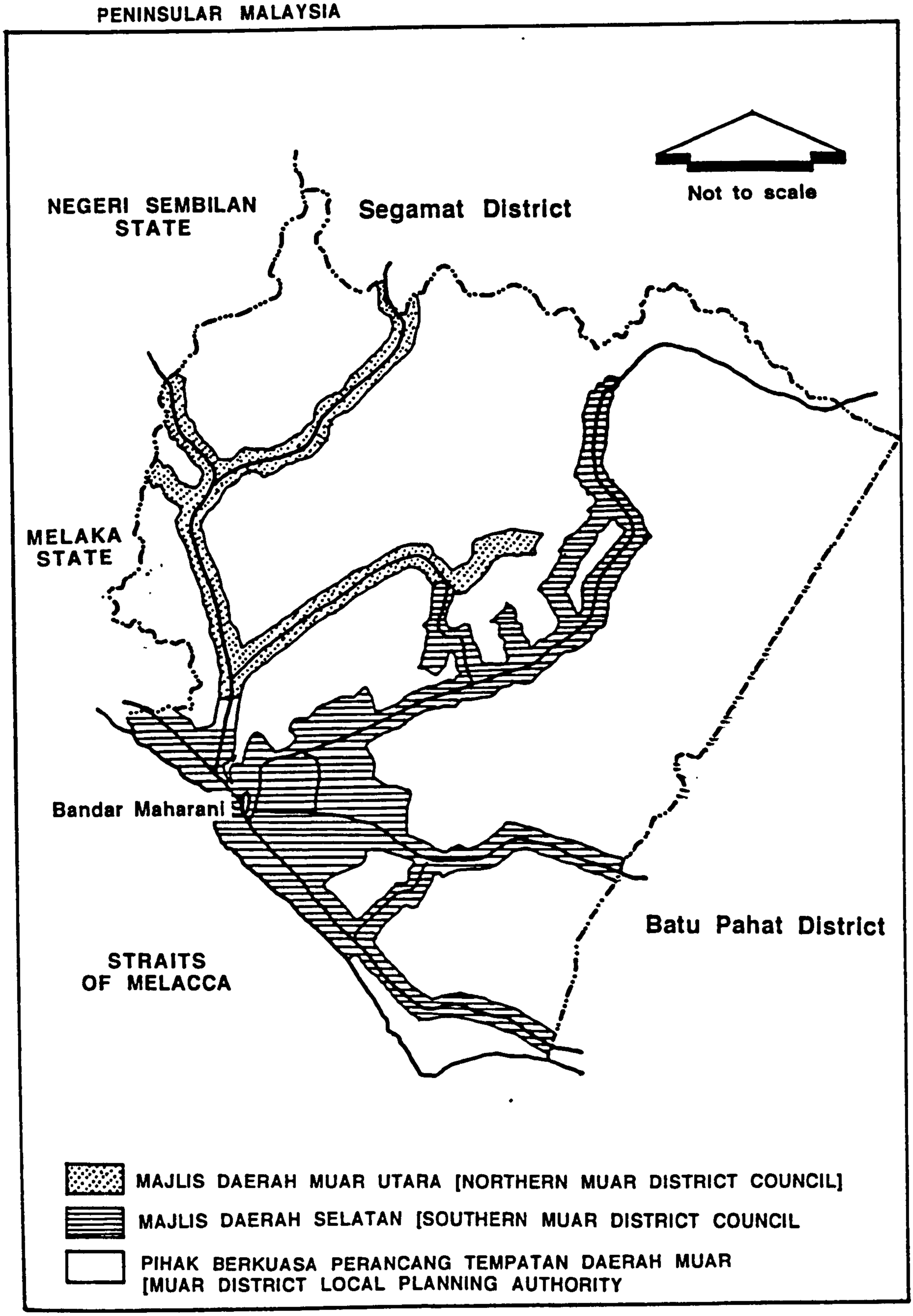
FIG. 7.1: POLITICAL-ADMINISTRATIVE ORGANISATIONAL HIERARCHY IN PENINSULAR MALAYSIA



From a predominantly peasant agricultural economy of the indigenous peoples, Malaya under British rule became a multi-ethnic nation with multi-economic activities, and changed from sultanates to a constitutional monarchy. The change came into effect with the introduction of new economic activities by the British [Lim *et. al.* 1990].

The indigenous people i.e. the Malays in Peninsular Malaysia were mainly *padi* [rice] farmers and spice traders with India and China. Although there were Chinese and Indians present during the Malay Sultanates, the main influx was when the British brought in Chinese labourers to work in tin mines and the Indians to work in rubber plantations. Later these economic activities are associated with ethnic groups: Malays are administrators and farmers; Chinese are miners and traders; and Indians are plantation workers and labourers. Since urbanisation in Malaysia is associated with the development of tin mining, the Chinese are also associated with urban areas, Malays [except administrators] with rural areas, and Indians with plantations and ports.

MAP C: LOCAL PLANNING AUTHORITIES IN MUAR DISTRICT, JOHOR STATE, PENINSULAR MALAYSIA



The brief description of the political-economic history of Malaysia is important in order to understand the present socio-economic issue of Malaysians, mainly the identification of race with economic activity. This phenomenon is a concern to the government, since the pattern of incidence of poverty is also associated with rural and urban areas, which as illustrated above, is also associated with ethnic groups. As seen in Table 7.1, although there was 17% of poverty incidence in Malaysia in 1990, 21.8% was in the rural areas, while only 7.5% was in urban areas. Regional variation of poverty incidence is also a cause for concern. The 15% poverty incidence in Peninsular Malaysia is considered low when it is compared to 34.3% in Sabah and 21% in Sarawak. All three regions show a higher incidence of poverty in rural areas than in urban areas: 19.3 % in rural Peninsular Malaysia, 39.1 % in rural Sabah, and 24.7 % in rural Sarawak.

The above ethnic, urban-rural and regional disparities have planted jealousy, dissatisfaction and suspicion among the peoples. This phenomenon eventually exploded into one week of racial riots in several major towns in May of 1969. This sensitive historic event, locally known in Malaysia as the "May 13 Incident", became the "eye-opener" and foundation for the introduction of the New Economic Policy [NEP] in the First Outline Perspective Plan 1971-1990 [OPP1]. The NEP was implemented in the four five-year development plans from the Second Malaysia Plan 1971-1975 to the Fifth Malaysia Plan 1986-1990. The NEP, with its two-prong national objectives of eradicating poverty irrespective of races, and restructuring of society so as to correct social and economic imbalances, was to promote growth with equity with the objective of fostering national unity among the various races [OPP1]. This rationale behind NEP is continued in the form of the National Development Policy [NDP] which is contained in the Second Outline Perspective Plan 1991-2000 [OPP2].

7.2.4 National planning ideology

The political-economic history of Malaysia and the socio-economic pattern of development has created a major responsibility in the central government for policy formulation towards nation-building. The goal towards national unity became the foundation for *Rukunegara* [National Ideology] which "declares the shared national objectives and values, confirms the fundamental principles to guide the citizens and the nation towards the task of creating a progressive, economically equitable, socially just, liberal and united Malaysian society" [OPP2, p. 7]. The Rukunegara is the ideology which sets the foundation for national development, and is quoted here:

"RUKUNEGARA...DECLARATION...
OUR NATION, MALAYSIA, being dedicated
to achieving a greater unity of all her peoples;
to maintaining a democratic way of life;
to creating a just society in which the wealth of the nation shall be equitably shared;
to ensuring a liberal approach to her rich and diverse cultural traditions;
to building a progressive society which shall be oriented to modern science and technology; ..."
[Sixth Malaysia Plan 1991-1995]

7.3 NATIONAL PLANNING SYSTEM

7.3.1 Introduction

Chapter 3 has established the desirability of operating under a strategic planning framework as a foundation for a national integrated planning system in general, and for an SEA within its land use planning system in particular. This section examines Malaysia's national planning framework within the context of an idealized strategic planning framework, and identifies several strengths and weakness that are inherent. Finally the strengths and weakness in the administrative links between socio-economic and land use planning are examined.

7.3.2 National Planning Framework

In consonance with its system of political-administrative hierarchy in Malaysia, there also exists a hierarchy of plans. The plans for each level of government, classified according to the plan type and status, are listed in Table 7.2.

Socio-economic plans and sectoral development plans are produced at federal, state and district levels. The OPP and the Five-Year Plans have political-administrative status and form the basis for all other plans in the hierarchy. The State Development Plan/State Economic Plan/State Indicative Plan/Sub-regional Physical Plan are *ad hoc* plans which are prepared administratively to guide development in the state or region. This is followed by the District Development Plan which is more formalised in its system and procedure for preparation, but nevertheless is only administrative in status.

The only statutory plans are structure and local plans which are prepared under the Town and Country Planning Act 1976 [Malaysia Act 172]. While the former is a strategic land use plan based on a socio-economic and physical framework, the latter identifies local and spatial implications of land development and land uses.

TABLE 7.2: HIERARCHY OF PLANS IN THE PLANNING SYSTEM IN PENINSULAR MALAYSIA

Levels of govt.	Plans	Plan type	Status
Federal	National Outline Perspective Plan.	Socio-economic.	Political-administrative
	Five-Year Development Plan.	Socio-economic/ sectoral	
State/Regional	State Economic Development Plan.	Socio-economic/ sectoral	Administrative and *ad hoc.*
	State Indicative Plan.	Socio-economic and spatial plan.	
	Sub-regional Physical Plan.		
District	District Development Plan.	Development Project identification.	Administrative.
Local	Structure Plan.	Strategic land use.	Mandatory under the Town & Country Planning Act 1976.
	Local Plan.	Local land use plan.	

The Malaysian system of socio-economic and land use plans suggests that the philosophy of planning as the management of environmental change is acclaimed. This philosophy is informed by the sense of strategy; goals to be attained, values to be realised, paths to be followed and practical ways of realizing these, just as prescribed by Kirby [1985], Alexander [1986], Bruton [1987] and Healey [1989]. The existence of this philosophy can be detected in the national goals and strategies which appear in the national plans, which in turn are determined by social values which are embedded in the *Rukunegara*. The Malaysian planning framework theoretically can be said to conform to Alexander's definition of planning:

> "Planning...The deliberate social or organization activity of developing an *optimal strategy of future action* to achieve a *desired set of goals*, for *solving novel problems* in complex contexts, and attended by the power and intention to *commit resources* and to act as necessary to *implement* the chosen strategy" [Alexander 1986, p. 47] - emphasis in italics.

"Optimal strategy of future action...desired set of goals...solving novel problems...commit resources...implement" quoted by Alexander are well defined in the strategic planning framework which has been examined in Chapter 3.

Table 7.2 shows a seemingly ideal system of planning hierarchy, where a type of policy/plan is prepared for each level in the political-administrative system. In terms of types and hierarchy of policies, plans and programmes, the national planning system in Peninsular Malaysia generally does seem to fit in within the idealized strategic planning framework. Table 7.3 establishes the 'fit' i.e. the link between polices and plans which exist in Malaysia today within the five levels in strategic planning. Confirming the principle that land use planning is an integral part of strategic planning, at least in the public sector, the table shows a mixture of

socio-economic and land use plans which are linked hierarchically according to their form and content.

The sections below examine each level of the idealized framework for strategic planning, within the Malaysian context, to assess whether or not the 'fit' functions effectively. It is important that the level of effectiveness of its operation is established, because this sets the framework for the examination and proposals ahead. The examinations in sections 7.3.3 - 7.3.7 are in order of the levels in the framework, while a general overview is made in section 7.3.8.

In summary, the Five hierarchical levels in the Idealised Strategic Planning Framework for planning and implementation in the public sector are:-

LEVEL 1 National objectives and policies for social and economic changes;

LEVEL 2 Strategic and spatial implications;

LEVEL 3 Local and spatial implications;

LEVEL 4 Resource allocation and financing; and

LEVEL 5 Monitoring and implementation.

7.3.3 LEVEL 1 National objectives and policies for social and economic changes

At Level 1 are national objectives and policies for social and economic changes. Malaysian national objectives and policies are in the form of the NEP which was implemented between 1970-1990, and its successor, the NDP, which has just been introduced in the OPP2 for the period 1991-2000. These policies and objectives are within the framework of *Rukunegara* which declares the shared national goal and values. To further secure social and economic advancement the Prime Minister has declared "*Vision 2020*" to be the long-term target to be achieved by the nation. This "Vision" is of "Malaysia as a fully developed nation by the year 2020 not only economically but also in all other aspects" [OPP2, p.4]. In this "vision", GDP is to increase from RM115 billion [£30 billion] in 1990 to RM920 billion [£242 billion] in 2020 i.e. eight times in twenty years at a growth rate of 7% per annum [Malaysia: The Way Forward 1991].

The national objectives and policies are contained in the national socio-economic plans, namely the OPP and the Five-Year Malaysia Plans which are the basis for all policies, planning and implementing strategies for national development. Brief descriptions of the NEP and NDP, OPP2 and the Sixth Malaysia Plan [SMP] are outlined below.

TABLE 7.3: THE PLANNING SYSTEM OF PENINSULAR MALAYSIA WITHIN THE IDEALISED STRATEGIC PLANNING FRAMEWORK FOR THE PUBLIC SECTOR

Idealized framework for strategic planning & implementation in the public sector	Instruments which exist in the Malaysian planning system today	Embodying legislation
Level 1 National objectives & policies for social & economic changes	Vision 2020 To be a fully developed nation by the year 2020. National Development Policy [NDP] To improve the standard of living & quality of life of all Malaysians through sustained and rapid economic growth. Second Outline Perspective Plan [OPP2] Embodies the NDP & sets out the broad objectives, strategies & targets that will guide the development of the nation in the nineties. Sixth Malaysia Plan [1991-1995] Elaborates the strategies as well as programmes & projects designed to achieve the objectives of NDP.	Political-administrative policy
Level 2 Strategic & spatial implications	Structure Plans Policies and general proposals in the local planning authority in respect of the development and use of land in that area, including measures for the improvement of the physical environment, the improvement of communications, and the management of traffic.	Town & Country Planning Act 1976 [Act 172]. Local Government Act 1976 [Act 171].
Level 3 Local & spatial implications	Local Plans Detail proposals for the development and use of land in the local planning area, including such measures for the improvement of the physical environment, the improvement of communications, and the management of traffic. Ad hoc informal plans Development plans, layout plans. Development Control Control over public and private developments.	Town & Country Planning Act 1976 [Act 172]. Local Government Act 1976 [Act 171]. Non-statutory Town & Country Planning Act 1976
Level 4 Resource allocation & financing	Five-year national financial plan in the Five-Year national economic plans. Annual national and state budgets. Annual budgets of the implementing agencies.	Political-administrative policy
Level 5 Monitoring & implementation	Monitoring by Implementation and Coordination Unit [for federal budgets] and by State Economic Planning Units [for state budgets]. Coordination & control of public & private development & investment through careful programming.	Political-administrative policy

NEP and NDP

NEP is the first major national policy for social and economic changes, and was introduced with the First Outline Perspective Plan 1970-1990. The goal of NEP is to achieve national integration and unity and this has been targeted in the form of its *two-pronged strategy* [OPP1, 1970-1990] described earlier.

The NDP which replaced the NEP was introduced in the OPP2 1991-2000. The objective of the NDP is to attain a *balanced development* in order to establish a more united and just society. Although the NEP has been relatively successful in reducing income inequalities and economic imbalances, these problems still remain as major challenges facing the nation today. The NDP therefore builds upon the on-going thrust of NEP in eradicating poverty and restructuring society. NDP sets the pace to enable Malaysia to be a fully developed nation by the year 2020. It is the basis for all strategies, policies, plans and programmes for the nation, at all levels.

Second Outline Perspective Plan 1991-2000 [OPP2]

OPP2 which embodies the NDP contains the national development thrust for the 1990's. The development strategy is premised on the following considerations:

- principle of growth with equity;
- a balanced societal development;
- moulding a Malaysian society with high moral values and ethics as well as positive thinking; and
- prudent management of natural resources.

Based on the above strategy, the OPP2 outlines Malaysia's growth prospects and policies for the next decade, and sets the strategies for regional development, human resource development, macro-economic prospects and sectoral targets.

In order to remain competitive in the export sector of manufactured goods and to sustain *rapid economic growth*, Malaysia must *increase its productivity and further diversify* into higher value-added production based on downstream processing and manufacturing of its natural resources and primary products for exports. The poorer states will be given emphasis in order to improve income and standards of living. To assist this, the human resource development programmes will promote a productive and efficient labour force with strong ethical and moral values and a commitment to excellence.

The OPP2 provides the framework for future policy-making, policies for *distributional objectives*, regional development and sectoral strategies and programme thrusts. The public sector will focus on the improvement of economic efficiency, policies to support private

investment, human resource development, and policies to stabilize public debt, deficits and spending. On regional development, increased labour mobility and dispersed economic activities will facilitate labour transfer from the agricultural and rural areas to meet labour shortages in industries that may worsen in the nineties. Programmes for expanding physical and social infrastructure in the less developed states will further open up new opportunities for growth. Emphasis will be put on *rural development* efforts in the resource-poor states, especially on commercialisation of in-situ agriculture and the development of small manufacturing industries.

Sectoral strategies and programme thrusts are mainly to promote further diversification and growth in value-added indigenous activities that will have widespread linkages across sectors, and to venture into new frontiers of development. In manufacturing, emphasis is on increased value-added products and industrial dispersal. In agriculture, it is to reduce resource outflow. Utilization of resources should ensure *sustainable development and environmental preservation*. To support the other sectors, technical and professional services, infrastructure, energy and social services will be enhanced. All these sectoral strategies and programmes will be implemented within the environmental strategy framework i.e. *economic development will be ecologically sustainable and balanced to maintain a clean and healthy environment with ecological and climatic stability.*

Sixth Malaysia Plan 1991-1996 [SMP]

The main aim of the SMP is to achieve the NDP within the framework of the OPP2. Its main thrust is to sustain Malaysia's growth momentum and manage it successfully so as to achieve a more balanced development of the economy. These are to be achieved through development strategies which include macro-economic strategies, sectoral strategies, distributional strategies, regional development strategies and human resource development strategies.

Overview

The NDP, OPP2 and SMP provide the ultimate objectives for all other policies and plans, including land use plans in Malaysia. These are termed the external purposes of planning by Davidoff and Reiner [1973]. However they do not contain the substantive matters for land use planning [termed the internal purposes] which are the spatial implications of development such as urban renewal, harmonious land use relations or most profitable output in any location. However they form the framework for determining the use of land in the country, an issue which is dealt with in plans lower in the hierarchy.

7.3.4 LEVEL 2 Strategic and spatial implications

Structure Plans

Structure plans are prepared under the Town and Country Planning Act 1976 [Act 172] and contain policies and general proposals of local planning authorities in respect of the development and use of land.

By definition and functions, structure plans seem to fit in with Level 2 of the idealized framework for strategic planning and implementation [Bruton and Nicholson 1987]. In reality however, the performance of the structure plan system within the strategic planning framework in Malaysia is arguable. This is mainly due to the sporadic nature of structure plans which results from the fragmented pattern of local authorities, as described in section 7.2.3.

Act 172 requires every local planning authority in Peninsular Malaysia, except Kuala Lumpur, to prepare a structure plan for its area. Kuala Lumpur is under the jurisdiction of the Federal Territory [Planning] Act 1982 which nevertheless also requires it to prepare a structure plan for its area.

The 95 local authorities other than Kuala Lumpur were formed during the local authority restructuring programme under the Local Government Act 1976 [Act 171]. Their planning functions are however provided by Act 172 which states that the local authority is the local planning authority for its area [Section 5].

Whether the local authority boundary was drawn in view of its planning function is questionable. Not only is their existence sporadic, their various areal sizes and shapes too make strategic planning difficult, inefficient and ineffective [Map C]. There could be two or three local authorities in one district, while the rest of the district is under the administration of the district officer. Only the Federal Territory of Kuala Lumpur, and three states of Kedah, Pulau Pinang and Melaka have complete areal coverage of local authorities.

The sporadic local authorities are made more difficult to plan in strategic terms because of their small sizes. Some are in fact much smaller then the local plan areas in the planning system in the UK. They range in size from 4.9 sq. miles [Sepang District Council in Selangor] to 764 sq. miles [Krai Selatan District Council in Kelantan]. This state of affairs makes it difficult to provide the framework needed to establish a coherent physical planning strategy at the local level.

The problem is aggravated because statutorily and formally there is a vacuum between national socio-economic plans and structure plans at the local authority level. There is no link between the former and the latter as there is no requirement to prepare structure

plans or physical land use plans at national or state levels. The problem is further aggravated by the fact that there is no system for issuance of strategic guidance, policy notes or planning directives on national, sub-national or regional physical development from the Federal or State governments, other than general indicative development frameworks which are interpreted from national socio-economic plans.

State/regional physical planning studies

Wherever they exist, these plans/studies could, albeit in a limited form, fill the planning vacuum which is identified above. However since these studies were prepared in an ad-hoc manner at different times and for different objectives, in reality the vacuum still remains.

Physical planning studies were prepared at state or sub-regional levels. Examples are the Melaka Master Plan Study 1984; Regional Study on the Integrated Development of South Terengganu 1985; Perak - An Economy under Transition; and Pulau Pinang: Into the 21st Century 1991. Some of these studies manage to interpret national policies and strategies and translate their spatial implications at the state or regional level. However being non-statutory, these studies are very often ignored by decision-makers and implementors. Nevertheless they do provide the planning authorities with strategic and policy guidance in the preparation of plans at the lower level, and even for development control purposes. Some of these studies are in fact still being used as guidance in the preparation of structure plans today. Unfortunately not all states and regions have these studies. Therefore the vacuum between national strategies and policies and local structure plans still exists.

'Joint' structure plans

To fill the vacuum between National plans and local authority plans, recently a new approach in the preparation of structure plans has been adopted i.e. the preparation of several structure plans simultaneously. One example is the Johor Barat Structure Plan Study [1989-1991], which is actually the preparation of structure plans for fourteen local planning authorities, in an area which covers five districts, simultaneously. This is only an administrative arrangement between the local planning authorities, since Act 172 does not provide for 'joint' structure plans. Since there is only one planning team for one large planning area, the whole area can be considered for strategic and spatial implications of national policies and strategies, an approach that is not possible for small planning areas.

District Development Plans

1990 saw the introduction of a new type of development plan at the district level. Introduced by the Economic Planning Unit [EPU] of the Prime Minister's Department, this plan combines the facets of a structure plan in terms of its strategic and spatial implications, and a master plan in terms of project identification. The plan is to complement the Five-Year Malaysia Plans at the

district level. However there is still a weakness here as institutionally there is still a vacuum between national plans and district development plans.

Overview

By their form and content, the structure plan system fits in with the idealized framework for strategic planning and implementation in Level 2. However as argued above, the weakness is in the local authority set up and the lack of intermediate strategic planning at the state or regional level. The issue of the effectiveness of the plans which are prepared, problems with implementation, and solutions for these weakness are addressed later in Chapter 8.

7.3.5 LEVEL 3 Local and spatial implications

By its form and content, local plans as provided by Act 172 can be seen as meeting the requirements of Level 3 of the idealized strategic planning framework and implementation [Table 7.3]. Like structure plans, functional local plans appear to have been established to meet the strategic planning requirements which are represented in Level 3:

- it makes specific policies and proposals for the use and development of land and buildings which are required to implement the more general sectoral policies established in the structure plans; and
- it has regard to the availability of resources needed to implement the proposals.

The responsibility for preparing local plans are with the local authorities, and this presents a problem, as nearly all of them do not have the capability to prepare, and much less, implement local plans [World Bank 1982, ADB 1987, Abdul Rahman 1991, McLoughlin 1992]. As described in Chapter 8, the preparation of structure plans is in reality taken over by the Town and Country Planning Department [TCPD], which, being understaffed itself, is not in the position to prepare many local plans. Furthermore, local plans should be prepared by planners in the local authorities themselves, and this in most cases, is not available at the moment [Abdul Rahman 1991].

By April 1992, the TCPD had prepared structure plans and local plans for 62 out of 95 local authorities, and 12 local plans. The difference in the number of structure and local plans prepared also indicate the difference in the level of experience in the preparation of structure and local plans in Malaysia.

Overview

Theoretically, given an effective planning process, and an efficient implementation system, the third level in the hierarchy of strategic planning framework is represented through local plans provided for in the planning act. This is complemented by the development control system [the responsibility of local authorities but actively assisted by TCPD] and ad hoc plans

which are prepared for public and private sector investment purposes by planning consultants. However in reality, this planning function in Level 3 is inadequately and ineffectively performed by the local authorities.

7.3.6 LEVEL 4: Resource allocation and financing

The resource allocation and financing programme in Peninsular Malaysia mainly appears at national and state levels. There are three sources of resource and finance, namely the federal government, state governments and the private sector. Structure and local plans are deficient in this aspect of planning.

At the national level, development allocations by sector and by state is made in the Five-Year Malaysia Plans. Financial control is made through two channels. The first channel is the Ministries and federal government agencies which include planning as well as implementing agencies or merely implementing agencies. Fig. 7.2 and Fig. 7.3 show these organisations as well as those with formal planning responsibility but without authority. The allocations are made for projects which are approved by the EPU.

Federal finance for development projects in the states is coordinated and controlled via two channels. Big development projects such as infrastructure, schools or hospitals are directly channelled to federal agencies which operate at the state level. These agencies are answerable to the ministries in charge of the projects. Federal finance for social or infrastructure projects such as roads, bridges and social facilities are channelled to the states via State Development Officers [SDOs] who are directly responsible to the Director-General of the Implementation and Coordination Unit [ICU] of the Prime Minister's Department. The implementation of these projects is coordinated and managed by district officers at the district level.

State Finance is controlled by the State Financial Officer and channelled to the various state agencies in the state [Fig. 7.3]. These are very small compared to federal finance. State finance is mainly for operations and small community facilities and services such as religious facilities. Local authorities are also dependent on the state governments.

Local authorities are weak in development programmes, resource allocation or financing. Writing of two local authorities [Kota Bharu and Kuala Terengganu] the World Bank [1982] notes that "there are severe constraints on the capability of institutions...to implement development plans" [p.227] and that there was a general considerable reliance on the States for advice and staff. Structure plans have not helped the programming of projects as they have tended to emphasize land use issues rather than the driving forces of development. This is supported by Abdul Rahman Jamal of the Economic Planning Unit [1991] who states

that local authorities "are often dependent on the states for financial assistance to run their own administration effectively. Without such assistance the local authorities are incapable of implementing development programmes" [p.8]. This phenomenon is not helped by the fact that the States themselves have limited revenue-raising powers and thus are dependent on central funding.

Overview

Resource allocation and finance is very much under central government control, although the administrative machinery filters down from federal level to district level [Figs. 7.2 and 7.3]. The exception is with private sector investments at the local level. Local plans which are prepared in Peninsular Malaysia provide very little guidance for resource allocation and financing. They merely rationalise the development and use of land, but with very little framework for programming and phasing and relative distribution between projects. This creates a breakdown in the idealized strategic planning framework.

7.3.7 LEVEL 5: Monitoring and implementation

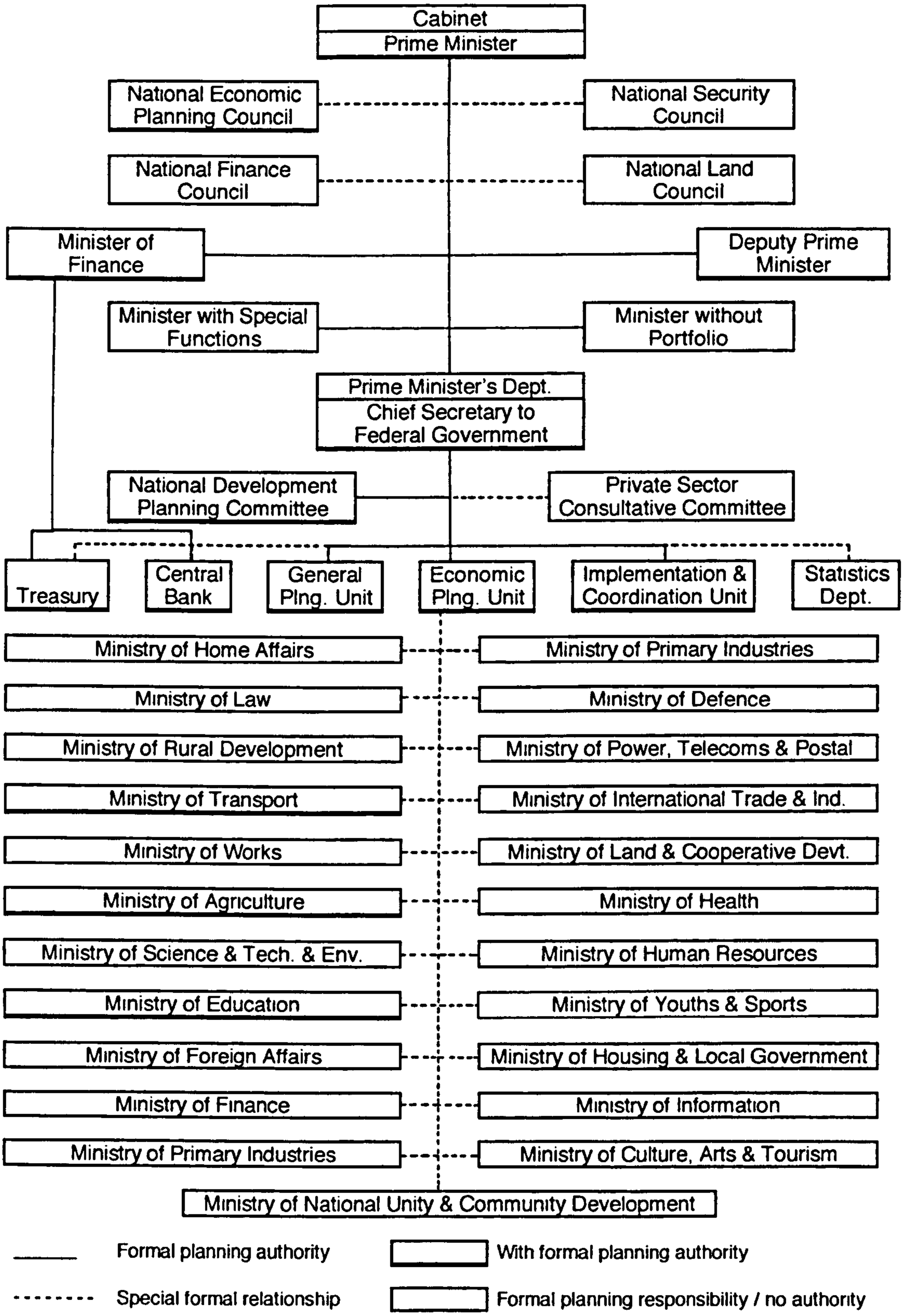
The state of affairs of monitoring and implementation is the same as with resource and allocation. Due to weak resource allocation and financing at the local level, it follows that monitoring and implementation too is weak at this level. As in Level 4, this weakness creates a breakdown in the strategic planning framework.

7.3.8 Overview of national planning system within the strategic planning framework

Despite the seemingly good fit between Levels 1, 2 and 3 of the idealized framework for strategic planning and the Malaysian planning system, there are problems in practice, as elaborated in the implementation structure of the structure planning system among the local authorities. However, as described earlier, the weakness in the local government system which leads to problems in structure planning has been overcome through administrative measures.

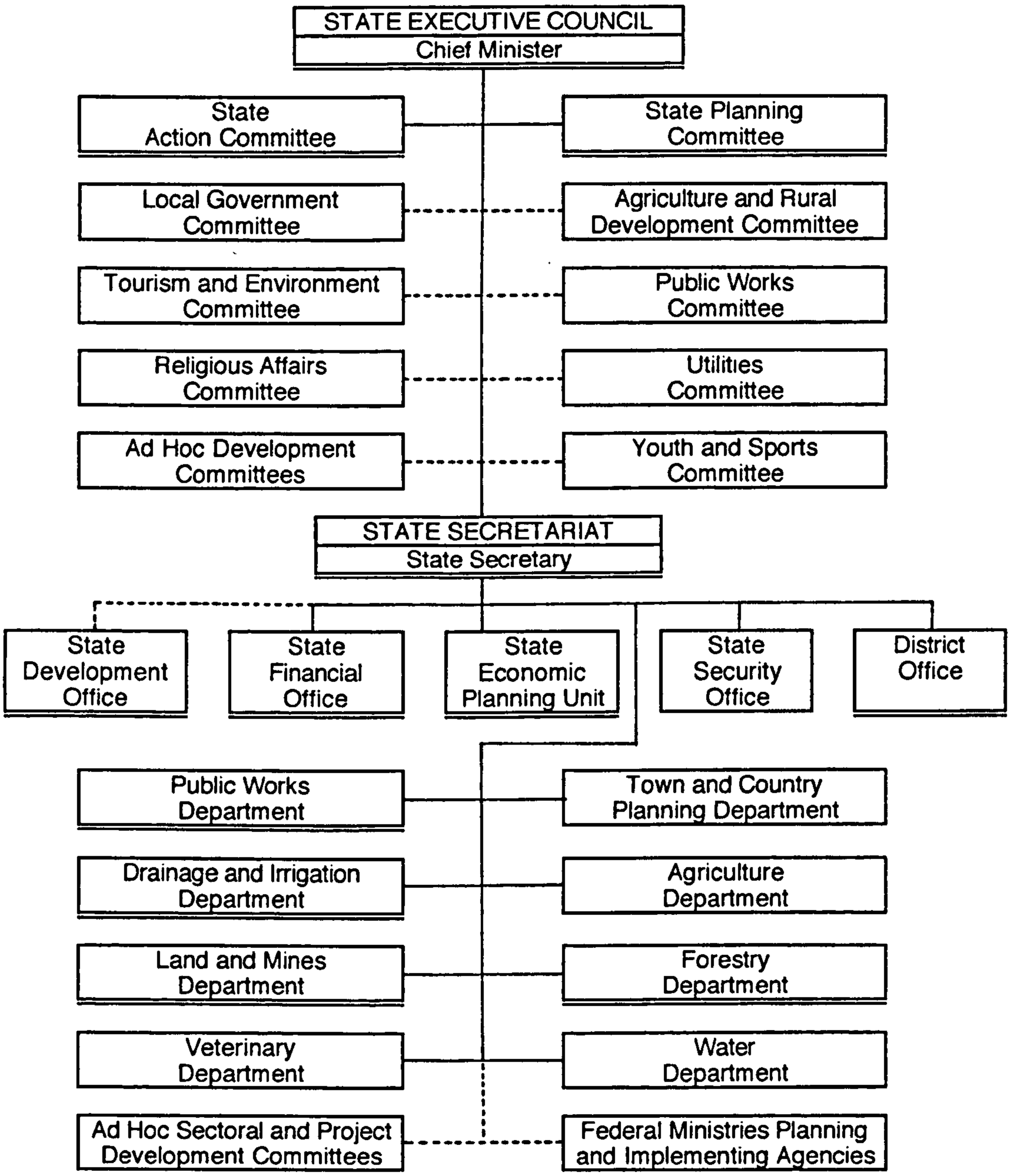
Levels 4 and 5 pose problems that cannot be solved administratively as yet. However, the fact that these activities are not formally present, puts a question mark on the capability of Malaysian land use planning to contribute to the achievement of social and economic changes as targeted by the national policies. If land use planning is to be made more effective, there is a need for a review of the local government system; the hierarchy and types of plans in the national planning system; and the planning, implementation and monitoring system which follows the framework of strategic planning. This is to be studied in line with the need for a national integrated development planning system as identified in Chapter 6.

FIG. 7.2: BASIC ORGANIZATIONAL STRUCTURE OF MALAYSIAN NATIONAL DEVELOPMENT PLANNING SYSTEM



Adapted and updated after Azman 1984.

FIG. 7.3: BASIC ORGANISATIONAL STRUCTURE OF MALAYSIAN STATE LEVEL DEVELOPMENT PLANNING SYSTEM



Adapted and updated after Azman 1984.

7.4 LINK BETWEEN SOCIO-ECONOMIC AND LAND USE PLANNING

7.4.1 Introduction

The idealized strategic planning framework and implementation which was examined in Chapter 3 has demonstrated the important link between socio-economic planning and land use planning. In a nation with a multi-economy like Malaysia's, strategic planning is considered as the ideal planning system to operate in, as the link between socio-economic planning and land use planning is formalised.

Having established the importance of land use planning in achieving national objectives while managing the inevitable environmental changes, this section examines decision-making in both socio-economic planning and land-use planning to see the extent of their relationship in Peninsular Malaysia.

7.4.2 Planning and decision-making

Fig. 7.4 illustrates the hierarchy of decision-making agencies in both socio-economic planning and land use planning. The diagram shows distinct vertical links between the agencies which are directly involved in the respective type of planning, but only weak informal horizontal relationships between socio-economic planning and land use planning. As shown the only horizontal link is provided by consultation activities between the responsible agencies.

The EPU of the Prime Minister's Department is the central agency responsible for socio-economic national plans. At the state level the EPU of the State secretariat [State EPU or SEPU] is the state agency which is responsible for the implementation of the plans. This task is also filtered down to district officers who are responsible for the district development plans which interpret the national development plans at the district level.

At the federal level, the Federal TCPD [FTCPD] is the responsible agency for coordinating the implementation of Act 172. FTCPD assists state governments and local authorities to carry out their responsibilities as required by the Act. In doing this the department is under the control of the Ministry of Housing and Local Government, which is responsible to the National Council for Local Governments [NCLG].

Because of the socio-economic nature of national plans, FTCPD is not directly involved with their preparation. Its involvement is only on matters which are directly related to urban policy and urbanisation, mainly through Inter-Agency Planning Groups which are

established by the EPU to review specific issues and make proposals to the main committee which is responsible for writing up the plans. The relationship between State TCPD and SEPU is also only on consultation basis. However SEPU is a member of the State Planning Committee [SPC] which is formed under Act 172, and therefore its involvement with decision-making on land use matters at the state level is more formal, and has statutory backing.

The weakness in the national planning system within the strategic planning framework, and the relationship between socio-economic planning and land use planning, as reflected in Fig.7.4, indicates a very weak integrated planning in Malaysia. While the strategic planning framework shows a vertical link between socio-economic planning and land use planning, the decision-making process and hierarchy only indicate a weak horizontal relationship through consultation. This weakness is reflected in the contents of the plans. The National plans consist of very little physical or land use implications of development, thus making it very difficult to be interpreted at structure plan level, particularly when there is no state physical plans which interpret these national socio-economic plans. This shortcoming is examined further in Chapter 8.

7.5 ENVIRONMENTAL PLANNING AND MANAGEMENT

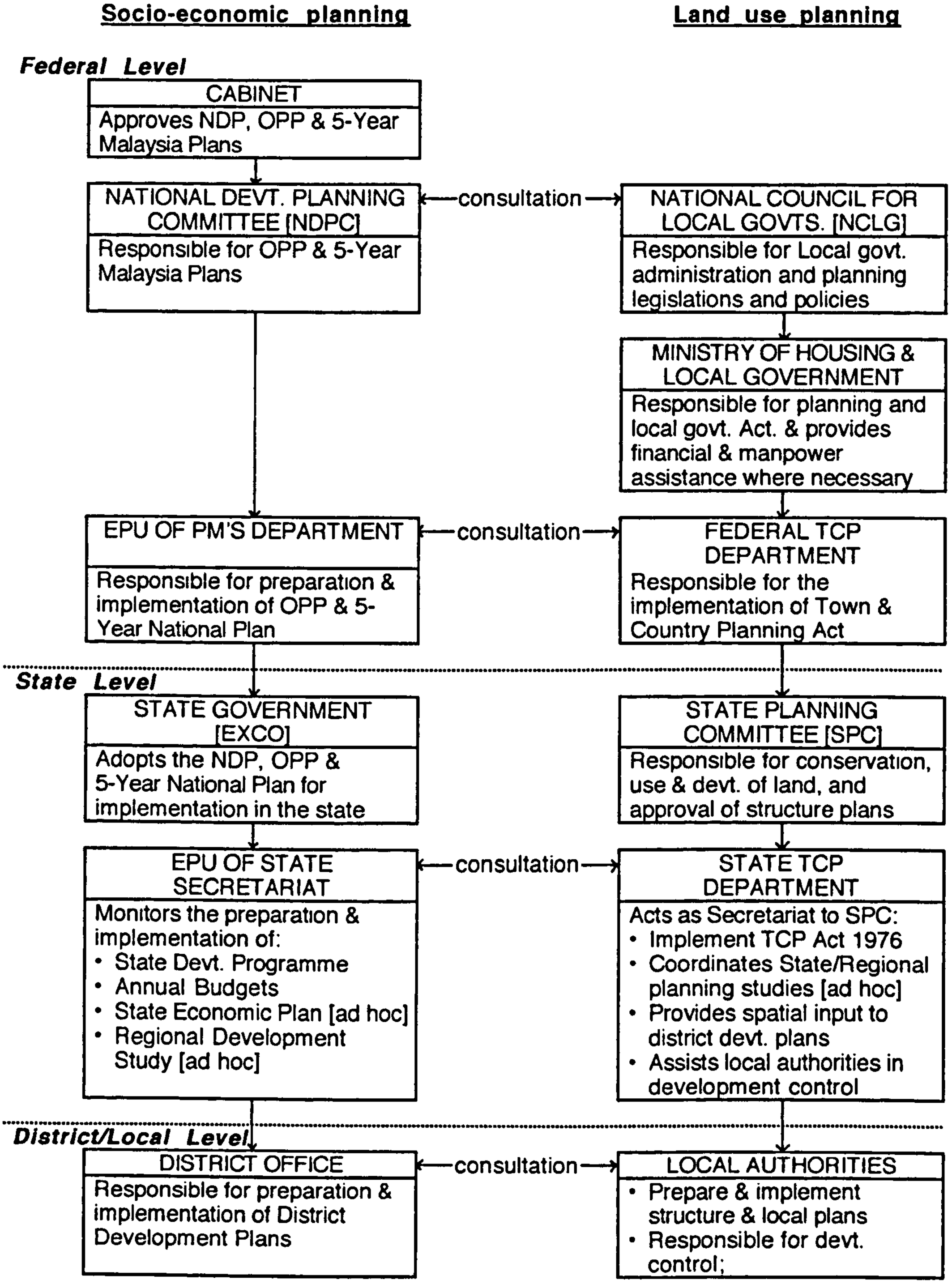
7.5.1 Introduction

This section examines Malaysia's environmental strategies, policies, laws and administration, and looks at environmental issues which are the concern of several environmental interest-groups. The objective of the examination is to assess its approach towards the global concern for the environment, and particularly its approach towards sustainable development. Malaysia's approach towards environmental planning and management has an implication on its potential for accommodating the integrated system of planning, and in particular the integration of SEA within its planning system.

7.5.2 Approach towards sustainable development

Malaysia is internationally known for its stand on environmental issues. In 1989 Malaysia initiated the Langkawi Declaration on Environment, in which "...The need to protect the environment should be viewed in a balanced perspective and due emphasis be accorded to promoting economic growth and sustainable development, including eradication of poverty, meeting basic needs, and enhancing the quality of life." One of the seventeen programmes of action is to advance policies and programmes which help to achieve sustainable development, including the development of new and better techniques in integrating the

FIG. 7.4: LEGISLATIVE & POLITICAL-ADMINISTRATIVE DECISION-MAKING IN THE PLANNING SYSTEM IN PENINSULAR MALAYSIA



NDP	National Development Policy	PM	Prime Minister
OPP	Outline Perspective Plan	EXCO	Executive Council
EPU	Economic Planning Unit	TCP	Town and Country Planning

environmental dimension in economic decision-making. This strategy towards sustainable development is apparent in the OPP2 and SMP.

Malaysia's stand on the sustainable development concept is best summarised in the summary of recommendations from the National Seminar on UNCED, 7-8 September 1992, in Kuala Lumpur. The summary of recommendations is as follows:

1. Malaysia is *ready to fulfil its commitments* arising out of the Rio decisions;
2. The Rio decisions, particularly Agenda 21, must be *examined by relevant agencies* in order to maximise those areas of interest and potential advantage to Malaysia;
3. As a developing country, Malaysia views *sustainable development as an evolutionary process* that would be phased in within the short, medium and long-term time frame;
4. As Malaysia keeps to the targets of Vision 2020, it is important to believe that *environmental imperatives need not be incompatible with development objectives*;
5. An *integrated approach on a national basis* requires and benefits from inputs and participation from the non-governmental sector, such as the business communities, academicians and other interest groups;
6. Malaysia has the *capacity to enhance the integration of environment and development nationally*, as the country has a resource base and potential as well as an endogenous capacity which allows for flexibility and choice of options;
7. There must be an *integrated approach between the centre and states*, and for *closer coordination between government agencies*, in order to achieve an effective national programme involving both development and environment;
8. There is a need to *review revenue sharing between states and the centre* in order to reduce state dependence on natural resources and thus promote sustainable development;
9. The government is to *review its national science and technology policy*, including special consideration for the development of environmentally sound technology, and research and development;
10. Other resources such as forestry and biological diversity require immediate attention in terms of their utilisation and the *requirement for sustainable management*;
11. At the institutional level, the preoccupation must be on *enforcement* and not excessive legislation;

12. *Sustainable development should be taught at institutions of higher learning* as well as at training institutes, such as INTAN, which should train public servants to be better able to face the challenges ahead in implementing Agenda 21; and
13. The proposed *National Council on Environment* [NCE] should be led at the highest political level by the Prime Minister.

7.5.3 Strategies, policies, law and administration

Strategies and policies

The trend in the development approach in national planning in post-independent Malaya [and then Malaysia] can be traced from the strategic approaches contained in the five-year plans. In the immediate post-independent years until early 1970s, the national goal was to increase economic wealth of the nation, in order to finance social and physical infrastructure development in the country. In line with this, the first plan [1965-1970] was essentially an economic development plan. With the adoption of NEP, the government adopted the 'place-oriented' or 'take people to jobs strategy' in the 1970s, followed by the 'people-oriented strategy' or 'take jobs to people strategy' in the 1980s. In line with these, the emphasis in the second plan [1971-1975] shifted from purely economic development to include the social dimension.

The 'people-oriented strategy' continued in the 1980s, but emphasis was also given to the environment. In fact starting from the third plan, the environmental element entered into national planning. This was the beginning of the 'environment-oriented strategy': "It is vital that the objectives of development and environmental conservation be kept in balance, so that the benefits of development are not negated by the costs of environmental damage" [Third Malaysia Plan 1976-1980, p.218].

The first active environmental movement was in 1970, when the Consumers Association of Penang [CAP] organized a seminar titled 'Environmental Control in Malaysia'. The seminar highlighted some crucial aspects of the problems of environmental pollution. However, environmental planning and management was only officially acknowledged in 1974 by the then Minister of Science, Technology and the Environment, while officiating a seminar on the environment, titled 'Modernisation and the Environment' organized by the Consumers Association of Penang and the Malaysian Nature Society. The seminar "acted as the first important step in influencing the development of environmental management in this country" [Minister of Science, Technology and the Environment 1982, p.8]. This was supported by Ken Rubeli [1982] who claims 1974 to be the beginning of public and government awareness of the need for environmental conservation.

1974 was significantly marked by the legislation of the Environmental Quality Act of 1974 and the focus by CAP on EIA of large-scale projects such as the Tembeling Hydro Electric project. In the same year the Malaysian government invited the World Bank to send a team to advise on environmental management. The work started in 1975, and was probably the principal influence in the environmental policy formulated for the Third Malaysia Plan [Ken Rubeli 1982].

Malaysia does not have a national environmental policy *per se* [Abu Bakar 1992a]. However environmental matters are covered in many policy areas such as: sustainable resource-use development; protection and maintenance in water, forestry, fisheries, wildlife and nature parks and reserves; human habitation, safety, health and welfare; soil conservation; maritime jurisdictions and resource use conflict resolution; and pollution control and preventive procedures.

In the preparation for the future, Malaysia has adopted the sustainable development concept in its development strategies. Towards its development by 2020, "Malaysia: The Way Forward" stresses that there must not be any waste of valuable natural resources; there must be productive and fertile land, clear and clean atmosphere, unpolluted water, and forest resources that are capable of regeneration. It is also stressed that the beauty of the land must not be desecrated, for its own sake, and for economic advancement. The significance of this vision is included in the development thrusts of the OPP2, which includes as its one of the critical aspects of its development thrust: "ensuring that in the pursuit of economic development, adequate attention will be given to the protection of the environment and ecology so as to maintain the long term sustainability of the country's development." [OPP2 1991-2000, p.5]. Sustainable development is also included as the fourth NDP strategy: "prudent management of natural resources and ecology as well as the preservation of natural beauty and clean environment are important to ensure sustainable development for the present and future generations." [OPP2 1991-2000 p. 6].

Environmental laws and administration

The Department of Environment has identified twenty-two environment-related laws and regulations in Peninsular Malaysia [Abu Bakar 1992a], covering sixteen resources/sectors. Table 7.4 shows these laws against the respective strategies which are related to the respective resources/sectors.

The administration of the various environment-related laws is the responsibility of a number of federal, state and local government agencies. By virtue of the Cabinet functional set-up, the Minister of Science, Technology and the Environment [MSTE] has the overall responsibility over environmental matters in the country. He is assisted by three implementing agencies, namely the Department of Environment [DoE], Department of Wildlife and National

Parks and the Secretariat to the Atomic Energy Licensing Board. As outlined in Table 7.5, there are 27 agencies that are directly involved in some aspects of the environment.

TABLE 7.4 : ENVIRONMENT-RELATED LAWS IN PENINSULAR MALAYSIA

Resource/ sectors	Strategy	Legislation	Year
Water	Resource use-sustainability	Water Enactments	1920
Forestry		Forest Rules	1935
Fisheries		Fisheries Ordinance	1936
Wildlife		Wildlife Protection Act	1972
Mining	Human safety and welfare	Mining Enactments	1929
Road transport		Road Transport Ordinance	1952
Merchant shipping		Merchant Shipping Ordinance	1952
Industry		Factories and Machinery Act	1967
Population	Human health	Public Health Ordinance	1960
Housing	Human settlement	Street, Drainage and Building	1974
Township		ActLocal Government Act	1976
		Town and Country Planning Act	1976
Agriculture	Human health	Pesticides Act	1974
	Soil conservation	Land Conservation Act	1960
	Pollution control	Piggery Enactments	1980
Radioactivity	Human health and safety	Atomic Energy Licensing Act	1984
Maritime matters	Resource use and conflict	Economic Exclusive Zone Act	1985
		Continental Shelf Act	1960
		Petroleum Mining Act	1972
Nature	Conservation for biodiversity	State Parks Ordinance	1930
		National Parks Act	
Environment	Pollution control & prevention	Environmental Quality Act [EQA]	1974
		Amendment to EQA	1985

Source: Abu Bakar 1992a.

The national Council for the Environment is still being formulated, to coordinate the policies as well as the functioning of all agencies, and to consider strategies and programmes which have implications on the environment, and to advise the government on policies towards a more holistic approach to environmental management [SMP 1991-1995]. In the meanwhile, the coordinating mechanism is through the political and administrative channels: at the political [since 1988], there are the annual meetings of the Federal-State Ministers and EXCO-members in charge of the environment; at the administrative level, there are the Environmental Quality Council, Federal-State Liaison Committee, and the Inter-Agency Planning Group related to the environment [Malaysian DOE 1991].

TABLE 7.5 : MALAYSIAN AGENCIES DIRECTLY INVOLVED IN ENVIRONMENTAL MATTERS

Environment-related subject matter	Agency
1. Aircraft safety and noise control	Civil Aviation Department
2. Animal husbandry.	Veterinary Services Department
3. Coastal erosion protection	Drainage and Irrigation Department
4. Energy	Ministry of Energy, Post & Telecommunication
5. Exclusive Economic Zone [EEZ]	Prime Minister's Department
6. Fisheries and Marine Parks	Fisheries Department
7. Forest	Forestry Department
8. General cleanliness/ streets/ building/drainage	Local Authorities [Local Governments]
9. Geology and hydrogeology	Geological Survey Department
10. Industrial pollution control and pre vention through Environmental Impact Assessment [EIA]	Department of Environment
11. Land and mines	Department of Land and Mines
12. Mining	Department of Mines
13. Navigational safety	Marine Department
14. Nuclear radiation	Atomic Energy Licensing Board
15. Occupational safety	Factories and Machinery Department
16. Pesticides	Department of Agriculture
17. Petroleum	National Petroleum [PETRONAS]
18. Physical [land use] planning	Town and Country Planning Department
19. General [economic] planning	Economic Planning Unit [EPU]
20. Public and occupational health	Health Services Department
21. Radioactive substances	Nuclear Energy Unit
22. Road vehicles	Roads Transport Department
23. Socio-economy	Socio-Economic Research Unit
24. Soil conservation	Department of Agriculture
25. Water Sources	District Office
26. Irrigation water	Drainage and Irrigation Department
27. Wildlife reserve and national parks	National Parks Department

Source: Abu Bakar 1992a.

There are four implementing strategies for the environment:

1. Monitoring and enforcement;
2. EIA in project planning;
3. Integration of environmental dimension in policy and development planning; and
4. Increase public awareness.

Under the first strategy, there will be more emphasis on prevention rather than on curative measures, and monitoring by regular collection of environmental data, particularly air and water quality . Under the second strategy i.e. EIA in project planning, potential problems are identified, and mitigating measures in planning prior to project approval and implementation is undertaken. This is implemented according to the Environmental Quality [Environmental Impact Assessment] Order of 1987, which came into force since April 1 1988. This strategy is further examined in Chapter 9.

Under the third strategy i.e. the integration of environmental dimension in policy and development planning, more efforts are made to ensure that policies, plans and programmes incorporate environmental dimension in its planning and implementation. For this, efforts are made to improve guidelines, regulations, rules and environmental standards. DOE also provides inputs to structure plans, master plans/development plans, and coastal protection works. The fourth strategy of increasing public awareness is carried out through formal and informal education, wide-dissemination of environmental information through environmental publication, exhibitions, seminars, workshops, lectures, and the mass-media. These efforts are shared between DOE, National Institute for Public Administration [INTAN] and the private sector [Malaysian DOE 1991, Abu Bakar 1992a].

7.5.4 Environmental issues

The DOE [1992a] has compiled a list of 55 environmental issues or problems, based on the opinions of four environmental interest groups in Malaysia, namely EPSM [Environmental Protection Society of Malaysia], SAM [Sahabat Alam Malaysia or Friends of the Earth, Malaysia], FOMCA [Federation of Malaysia Consumers Association], and EQC [Environmental Quality Council] [see Table 7.6].

It is noted that the first three issues agreed by all four groups are the common pollution problems which are normally associated with urban and industrial development. Loss of habitat and wildlife species reduction are associated with rural infrastructure development which are commonly associated with developing countries. Considering the relatively new environmental movement in Malaysia, the issues which have been identified reflect an awareness of the need for sustainable development.

7.6 CONCLUSIONS

The examination of Malaysia's political-ideological framework has identified a complexity of national, state and local administrative links, while there is a strong influence of the federal government over state and local governments. National strategies, policies, plans and programmes, through the National Development Policy, are aimed towards national unity, which is to overcome national problems such as economic disparities, urban-rural disparities, regional disparities, and the association of economic activities with ethnic groups. Encompassing these is the strategy for sustainable development which underlies all national strategies and policies.

Although the hierarchy of policies and plans seem to 'fit' in with the idealized framework for strategic planning and implementation for the public sector, there are underlying problems which make the 'fit' ineffective. The NDP, OPP2 and SMP do not contain

TABLE 7.6: ISSUES IDENTIFIED BY ENVIRONMENTAL GROUPS

	ISSUES	INTEREST GROUPS			
		EPSM	SAM	FOMCA	EQC
1.	Air pollution	X	X	X	X
2.	Surface water pollution	X	X	X	X
3.	Soil erosion	X	X	X	X
4.	Loss of habitat [terrestrial]	X	X	X	X
5.	Wildlife species reduction	X	X	X	X
6.	Solid waste management	X	X	X	
7.	Flashfloods	X	X	X	
8.	Siltation of surface water	X	X	X	
9.	Depletion of fishery resources	X	X	X	
10.	Acid rain	X	X		
11.	Toxic chemicals in the environment	X	X		
12.	Hazardous waste management	X	X		
13.	Lead in atmosphere	X	X		
14.	Noise	X	X		
15.	Domestic sewage in surface water	X	X		
16.	Industrial effluents in surface water	X	X		
17.	Chemicals in surface water	X	X		
18.	Marine pollution	X	X		
19.	Pig waste	X	X		
20.	Quality of agriculture land	X	X		
21.	Beach erosion	X	X		
22.	Flora, species reduction	X	X		
23.	Parks and recreation areas	X	X		
24.	Deforestation	X	X		
25.	Mangrove destruction	X	X		
26.	Coral reef destruction	X	X		
27.	Nuclear energy	X	X		
28.	Energy resources management	X	X		
29.	Dislocation of Aborigines	X	X		
30.	Fishermen's income reduction	X	X		
31.	Occupational health	X	X		
32.	Environmental impact assessment	X	X		
33.	Data/Information dissemination	X	X		
34.	Environmental education	X	X		
35.	Citizen representation in EQC	X			
36.	Federal-State relations	X	X		
37.	Environmental Quality Act	X	X		
38.	Ambient air quality standards	X	X		
39.	Occupational health law [co-ordination]	X	X		
40.	Pesticides, use	X			
41.	Droughts	X			
42.	Heat Island	X			
43.	Haze	X			
44.	Ground water depletion / contamination	X			
45.	Surface water depletion	X			
46.	Soil management	X			
47.	Mining land rehabilitation	X			
48.	Forest management	X			
49.	Rural poverty	X			
50.	Over exploitation of fisheries	X			
51.	Rural medical facilities	X			
52.	Public transport	X			
53.	Rural potable water supply	X			
54.	Research	X			
55.	Enforcement	X			

Note: EPSM = Environmental Protection Society of Malaysia; SAM [Friends of the Earth Malaysia]; FOMCA = Federation of Malaysia's Consumers' Association ; EQC = Environmental Quality Council.

Source: Abu Bakar 1992a.

the substantive matters for land use planning. However they form the framework for determining the use of land in the country. The sporadic nature of the local authorities, and their small sizes, make it difficult to provide the framework needed to establish a coherent physical planning strategy at the local level. This is made more difficult by the planning vacuum between national socio-economic plans and structure plans at the local level. Nevertheless this problem has been overcome by the administrative initiative to prepare 'joint' structure plans for local authorities. Although by form and content local plans under Act 172 should perform local spatial planning, in reality the function is inadequately and ineffectively performed. This is because of the inadequacy of the local authorities in terms of finance and manpower. This also makes implementation and monitoring very ineffective, since resource allocation and finance is very much under central government control, although the administrative machinery filters down from federal level to district and local levels.

The above weakness in the planning system provide a question mark on the capability of land use planning to contribute to the achievement of social and economic changes. There is a need to study further the local government system, the hierarchy and types of plans and policies, and the planning, implementation and monitoring system. The potential for a national integrated planning system needs further study, in view of the identified weak horizontal links/relationships between agencies which are involved in socio-economic planning and those involved in land use planning, although there seems to be very strong vertical links among the respective agencies.

Malaysia has no national environmental policy per se, but its stand on the relationship between development and environment, specifically on sustainable development, is clear from the recommendations from the national seminar on UNCED. However, although the NDP, OPP2 and SMP, which put forward the 'environment-led strategy', serve well as the policies for social and economic change, there is a need to review the machinery which is required to interpret these policies in spatial terms and effectively implement and monitor them, in consonance with limited valuable resources.

Chapter 8

Malaysian land use planning system

8.1 INTRODUCTION

This chapter examines the Malaysian land use planning system in order to establish how it can be integrated into a national integrated planning system, and how SEA can be integrated into land use planning in Malaysia. With this objective, the chapter first examines the legislative-administrative framework of land use planning, where the roles and responsibilities of the respective planning authorities are examined.

Section 8.4 examines the form and content of Malaysian structure plans, and identifies some outstanding issues that need to be addressed. The planning process, public participation process and the decision-making and plan-making processes are examined . Section 8.5 describes the evaluation exercise that has been carried out on four structure plans. The objective of the exercise is to determine the level of performance of these structure plans in their consideration of sustainable development issues. Finally section 8.6 examines various opinions on national integrated planning and SEA in land use planning. These opinions have been obtained from land use planning and environmental experts who were interviewed in Malaysia.

8.2 LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

8.2.1 Introduction

Although there are two planning acts in operation, the examination in this section is only of Town and Country Planning Act 1976 [Act 172], which governs 95 out of 96 local authorities. Other planning-related legislation is also mentioned, but not examined.

The roles and responsibilities of the planning authorities at Federal, State and local levels are illustrated, while the section on Development Plan System highlights the strategic importance of structure and local plans, and the role of public participation in the plan-making and decision-making process.

The examination of the planning legislation in this section is to prepare the background for the examination of structure plans in section 8.4 and their roles in sustainable development and national planning in sections 8.5 and 8.6 respectively.

8.2.2 Legislation

Land use planning in Peninsular Malaysia [except the Federal Territory of Kuala Lumpur] is regulated by the Town and Country Planning Act 1976 [Act 172], while the Federal Territory [Planning] Act 1982 [FTP Act] operates for Kuala Lumpur. The major differences between the two planning acts are in the administrative frameworks and mechanisms for development control, since both incorporate the structure plan system of planning. This thesis only examines Act 172, since this is the planning act which covers the 95 local authorities which are formed under the Local Government Act 1976 [Act 171].

Town and Country Planning Act 1976 [Act 172]

Land use planning, or town and country planning as it is termed in Malaysia, is in the Concurrent List of the Federal Constitution. Therefore Act 172 is an adoptive act, i.e. the state governments, which are the bodies responsible for planning in their areas, can adopt all or part of the Act for all or part of their areas. The Act is modelled on the Town and Country Planning Act 1971 for England and Wales [Bruton - undated, Lee et. al. 1990, Goh 1991].

Under Act 172, all local authorities which are formed under Act 171 are local planning authorities [provided under Section 5(1) of Act 172]. Where it is necessary, the act provides that person or persons can be appointed to be the local planning authority of an area which is not covered by a local authority under the Local Government Act [provided under Section 5(1) and (2) of Act 172].

Act 172 introduced many changes in the land use planning system in Peninsular Malaysia. The most prominent change is the introduction of the development plan [under Part III] which comprises of structure and local plans, to replace the 'town plans' which were prepared under the old Town Boards Enactment [Cap 137]. With this act also came the more formal process of publicity and public participation in plan-making [provided under Section 9 for structure plans and Sections 13 and 14 for local plans], instead of merely the opportunity to object to the plan under the former legislation.

Act 172 also streamlines the development control procedure by introducing the development charges concept [under Part IV] and provides for the formation of Appeal Boards [under Part VI] for the service of the people. To facilitate development, the Act introduces the Development Area concept [under Part VIII]. Since this thesis is concerned

only with land use planning, reference to the act in this chapter is confined to Part III, which is on Development Plans.

Planning-related legislation

Beside Act 172, there are 22 planning-related pieces of legislation which have varying degrees of influence in development planning and development control at the local authority level. These are listed in Table 8.1.

TABLE 8.1: PLANNING AND PLANNING-RELATED LEGISLATION IN PENINSULAR MALAYSIA

nos.	LEGISLATIONS
1.	Town and Country Planning Department 1976 [Act 172]
2.	Federal Territory [Planning] Act 1982
3.	National Land Code 1965
4.	Malay Reserve Land
5.	Land Acquisition Act 34/1960
6.	Land Conservation Act 3/1960
7.	National Forestry Act
8.	National Land Rehabilitation and Consolidation Authority [Incorporation] Act 22/1966
9.	Urban Development Authority Act [Act 46]
10.	Burials Enactment F.M.S. Cap 189.
11.	Regional Development Authority Acts [for DARA, KETENGAH, KESEDAR, JENGKA, PERDA, LANGKAWI
12.	Control of Rent Land Act 56/1966
13.	Housing Developers [Control and Licensing] Laws [Act 118]
14.	Local Government Act 1976 [Act 171]
15.	Streets, Drainage and Building Act 1974 [Act 133]
16.	Uniform Building By-Laws.
17.	Environmental Quality Act 1974
18.	Federal Constitution
19.	Piggery Enactments
20.	Economic Exclusive Zone Act 1 1985
21.	State Parks Ordinances 1930
22.	National Parks Act 1930

Source: Federal Department of Town and Country Planning, Peninsular Malaysia 1992a.

8.2.3 Roles and responsibilities

Act 172 provides for specific functions to authorities which are directly involved in land use planning. Four major authorities with their specific roles and responsibilities are illustrated in Fig. 8.1. They are the Federal Minister of Housing and Local Government at the Federal level, the State Authority, the State Planning Committee and the Local Authority.

Minister of Housing and Local Government

Being an adoptive act, Act 172, which is passed in Parliament, is only implemented when it is adopted by the State Government [Section 1(2)], with the *concurrence of the Minister*, and by notification in the State Gazette. By virtue of the Cabinet set-up the Minister of Housing and

Local Government is the Minister responsible for this act. As the chairman of the National Council for Local Governments [NCLG] the Minister is also responsible for any amendment to the act, or any regulations pertaining to the implementation of the act.

FIG. 8.1: MAJOR ROLES AND RESPONSIBILITIES AS SPECIFIED BY THE TOWN AND COUNTRY PLANNING ACT 1976 [ACT 172]

Section 1(2)

FEDERAL MINISTER OF HOUSING & LOCAL GOVERNMENT

Provides concurrence to the adoption of the Act by the State Authority

Sections 3 & 4

STATE AUTHORITY

- Responsible for the general policy in respect of the planning of the devt. & use of land s & buildings within the local planning area.
- Establish the State Planning Committee [SPC]

Section 4

STATE PLANNING COMMITTEE

- Promotes in the state, within the framework of national policy, the conservation, use & devt. of lands in the state.
- Advises the State Govt. on matters relating to the conservation, use & devt. of land in the state.
- Undertake, assist in, & encourage the collection, maintenance, & publication of statistics, bulletins & monographs & other publications relating to town & country planning & its methodology.
- Approves the structure plan.
- Issues certificate of conformity with structure plan to local plans

Sections 5 & 6

LOCAL AUTHORITY

- Acts as local planning authority for its area.
- Regulates, control, & plans the devt. & use of all lands & buildings within its area.
- Undertakes, assists in, & encourage the collection, maintenance, & publication of statistics, bulletins & monographs, & other publications relating to town & country planning & its methodology.
- Performs other functions as the State Authority or SPC assign.
- Prepares and implements structure and local plans.
- Responsible for development control in its area.

State Authority

By adopting Act 172 the State Authority legally enforces its *responsibility over all planning matters in the state.* It is responsible for the general policy in respect of the planning of the development and use of lands and buildings within the area of every local planning authority in the state [Section 3]. The State Authority establishes the State Planning Committee [SPC] and is empowered to give directions to it on any matters related to land use planning and development [Section 4]. For the Development Plan, the structure plan only comes into effect after it has been given assent by the State Authority, after the approval by the State Planning Committee [Section 10(6)].

State Planning Committee [SPC]

Next to the State Authority, the SPC is the most powerful body in the land use planning system. While it is the authority which approves structure plans prepared by local planning authorities [Section 10], the SPC is *responsible for the conservation, use and development of land in the state* [Section 4]. While it is also the adviser to the State Authority on matters relating to land use and land development, it is also *responsible for the promotion of the land use planning system and planning methodology.* The SPC consists of the following members:

a] a Chairman, being the *Mentri Besar* or Chief Minister of the State;

b] a Deputy Chairman, being a member of the State Executive Council, to be appointed by the State Authority;

c] the State Secretary;

d] the State Director of Town and Country Planning, who shall be the Secretary of the Committee;

e] the State Director of Lands and Mines;

f] the State Director of Public Works;

h] the State Legal Adviser; and

i] not more than four other members to be appointed by the State Authority.

Local authority

Local authorities which are formed under the Local Government Act [Act 171] are local planning authorities over their areas [Section 5(1) of Act 172]. Besides this, under Act 172, other person or persons can also be appointed to be the local planning authority for an area which does not fall under the jurisdiction of Act 171 [Section 5(2)]. These local authorities are *responsible to regulate, control and plan the development and use of all lands and buildings within their areas,* and are also *responsible to undertake activities which will promote the advancement of land use planning and its methodology* [Section 6]. Under Part 3, local planning authorities must prepare and implement structure and local plans.

Overview

Act 172 provides for the development of an efficient land use planning system in the country. However in reality most of the functions listed in Fig. 8.1 have not been effectively carried out by the respective authorities, although the act was passed in 1976. The State Authority does perform its responsibility over the development and use of lands and buildings, but generally not through this Act. Subdivision and conversion of land for development are made under the National Land Code of 1965 and the State Land Rules, while environmental management is carried out under various legislations, particularly the Environmental Quality Act 1974. Other than examining structure plans which are submitted to it by the local authorities for approval, the SPC has performed relatively very little of its other functions. Other than preparing structure and local plans [those which are fortunate to have the resources], and being actively involved in planning control activities, local planning authorities too are not performing their roles effectively.

As examined in Chapter 7, the main reason for the above deficiency is the lack of manpower and finance at the state and local levels of planning organizations [this conclusion is supported by opinions which are obtained from interviews with planning officials]. While there is a legislative machinery for the implementation of an effective planning system, there has not been a complementary development in manpower and financial resources in land use planning.

8.2.4 Development plan system

Part III of Act 172 requires all local planning authorities to prepare Development Plans for their areas. A development plan is made up of a structure plan and one or more local plans for the whole or parts of the area. The principles and concepts of the plans are examined below.

Structure plan

The structure plan preparation follows the rational planning process of survey - analysis - proposals. The prerequisite for a survey before planning is made under Section 7. Matters to be surveyed include the principal physical, economic, environmental, and social characteristics and land uses of the local planning area and those of the neighbouring area; population; transport and communication systems; and any changes already projected and are likely to have effects on the development, or the planning of the development of the planning area [Section 7(3)]. The structure plan is defined as:

> "a written statement -
> [a] formulating the policy and general proposals of the local planning authority in respect of the development and use of land in that area, including measures for
>
> the improvement of the physical environment, the improvement of communications, and the management of traffic;

[b] stating the relationship of those proposals to general proposals for the development and use of land in the neighbouring areas that may be expected to affect that area; and
[c] containing such other matters as may be prescribed or as the State Planning Committee may in particular specify;"
[Section 8(3) Act 172].

The policies and general proposals must be justified by the results of the survey under Section 7 and by any other information [Section 8(4)]. They must have particular regard -

[a] to current policies in respect of the social and economic planning and development and the environmental protection of the State and the Nation;
[b] to the resources likely to be available for the carrying out of the proposals of the structure plan; and
[c] to such other matters as the Committee may direct it to take into account.
[Section 8(4) Act 172].

As mentioned earlier, Act 172 introduced a formal system of public participation in plan-making. The first formal stage of public participation is when the public is given the opportunity to make representations to the local planning authority on matters that are included in the report of survey and matters which are considered to be included in the structure plan [Section 9(1)]. The second formal stage is when the public is given the opportunity to inspect the draft structure plan and make objections to its policies and proposals [Section 10(3)].

The structure plan is therefore more than merely a physical land use plan, because it also considers social and economic developments which affect land uses and the environment. The role of the structure plan in sustainable development is examined later in section 8.4.

Local plan

The local plan is prepared for the whole or part of the local planning authority area, and it must conform to the approved structure plan [Section 12(8) of Act 172]. It interprets strategic and spatial implications of structure plans and presents the local and spatial implications of national objectives and policies for social and economic changes. In doing so it should provide the framework for resource allocation and financing of development projects. A local plan consists of:

"a map and a written statement which:
[a] formulates, in such detail as the local planning authority thinks appropriate, its proposals for the development and use of land in the area of the local plan, including such measures as the local planning authority thinks fit for the improvement of the physical environment, the improvement of communications, and the management of traffic: and
[b] contain such matters as may be prescribed or as the State Planning Committee may in particular case specify."
[Section 12(3) Act 172].

Act 172 also provides for a formal system of public participation in local plans preparation. The public is given the opportunity to make representations on the draft local plans before it is adopted by the local planning authority [Sections 13 and 14].

8.3 STRUCTURE PLANS

8.3.1 Introduction

The importance of structure plans in national development planning has been examined and acknowledged in Chapter 7. Under Act 172, structure plans have the strategic role of interpreting national socio-economic policies into spatial dimensions for local authority areas, and providing the framework for the proposals for the development and use of land in local plans.

This section examines the Malaysian framework for the preparation of structure plans; its planning process; the publicity and public participation process; and its decision-making structure. The objective of this section is to highlight some pertinent issues which have relevance in the examination of the role of structure plans in sustainable development and in national planning, and subsequently, the potential for integrating SEA into Malaysian land use planning in Part III.

8.3.2 Planning process

As stated earlier, Act 172 provides the framework for the rational planning model of survey-analysis-proposals. The preparation of structure plans in Peninsular Malaysia follows the normal planning process commonly adopted elsewhere, including the UK, with only minor variations to comply with legislative and administrative requirements. The general steps followed are listed in Table 8.2, which also identifies the responsible authorities as provided in Act 172. The various steps are set against the typical land use planning process which has been examined in Chapter 3, and which has been incorporated in the idealized conceptual framework in Chapter 6.

The planning process is illustrated in Fig. 8.2. The whole process results in four official reports: the Report of Survey [ROS], the Statement on Publicity and Public Participation [SPPP], the Draft Structure Plan [DSS] [or Draft Written Statement], and the Structure Plan [SP] [or Written Statement].

The Report of Survey [step 4], which contains the results of the analysis of the existing situation or baseline information [step 2], and findings on problems and issues, as well as general strategies and proposals [step 3], are made accessible for public examination.

This is the opportunity given to the public to make representations on matters relevant to structure plans to the local planning authority. Representations by the public are considered [step 5] for the preparation of the Draft Structure Plan by the local authority [step 6].

TABLE 8.2: STEPS IN THE PLANNING PROCESS AND THE RESPONSIBLE AUTHORITIES UNDER ACT 172

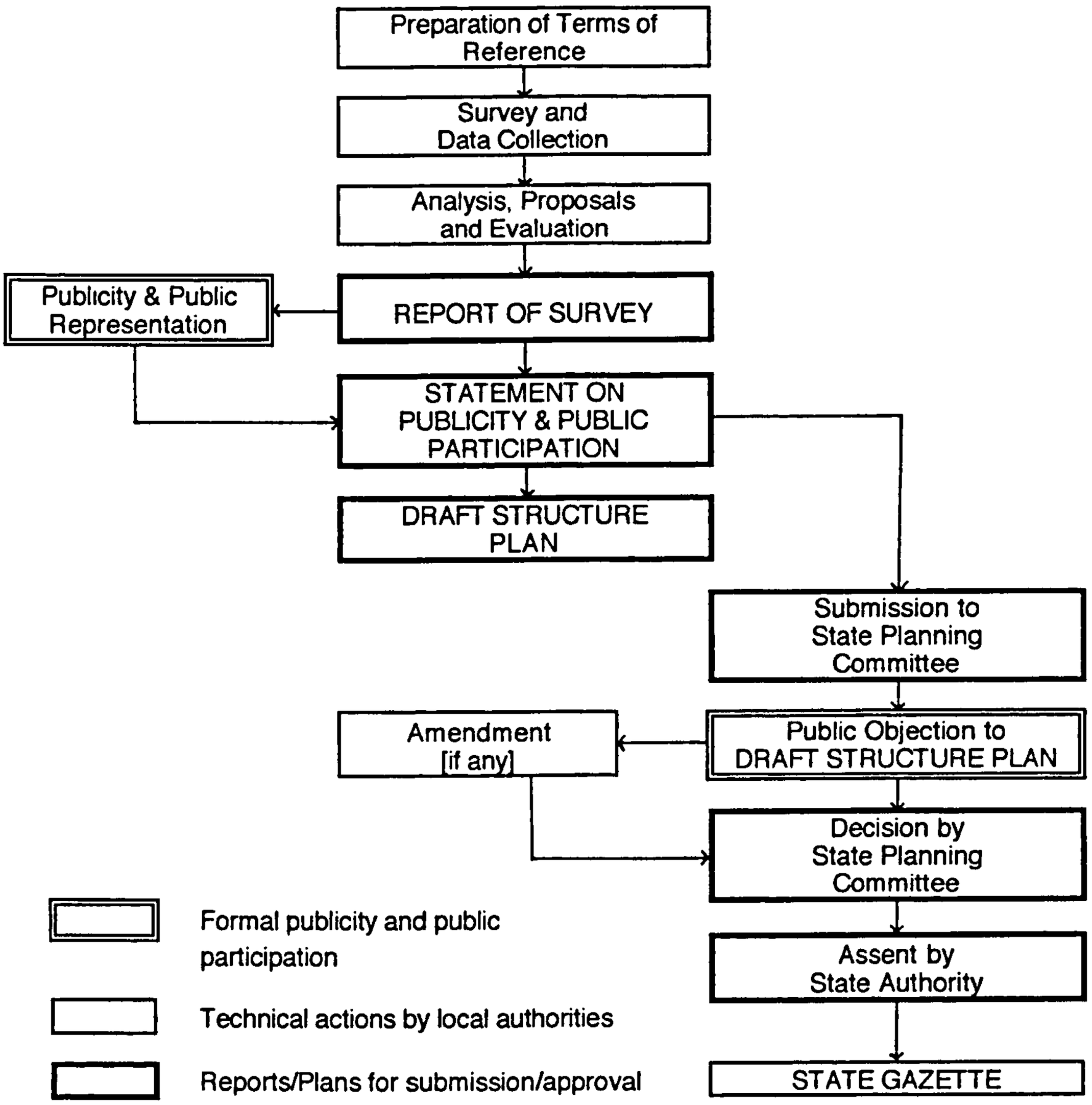
Typical planning process	Malaysian planning process	Responsible Authorities
Stage 1: Formulation of goals and objectives	1. Preparation of TOR	LA
Stage 2: Survey, prediction and analysis	2. Survey and data collection	LA
	3. Analysis, proposals and evaluation	LA
Stage 3: Generation and evaluation of alternative plans	4. Preparation of ROS	LA
	5. Consideration of public participation on ROS	LA
		LA
	6. Preparation of DSP	LA
	7. Submission of SPPP & DSP to SPC for approval	LA
Stage 4: Decision, implementation and monitoring	8. Consideration of public objections to DSP	SPC
	9. Decision on DSP	SPC
	10. Assent on approval of DSP	SA
	11. Publication of State assent in State Gazette	SPC
	12. Implementation & monitoring of SP	LA

Note: TOR = Terms of Reference; ROS = Report of Survey; DSP = Draft Structure Plan; SP = Structure Plan; LA = Local Authority; SPC = State Planning Committee; SA = State Authority; SPPP = Statement on Publicity & Public Participation

The period of public representation is preceded by a publicity drive which is mandatory by law, to ensure that the public is adequately informed of their rights to make representations in plan-making, and is given the opportunity to do so. Proof of 'adequate publicity' given to the public and the considerations made on the public representation by the local planning authority is contained in the Statement on Publicity and Public Participation [step 5], which is submitted to the State Planning Committee together with the Draft Structure Plan [step 7].

The State Planning Committee, after receiving the Draft Structure Plan, will consider any objections, if there are any [step 8], and will decide whether or not to approve it whole or in part, or approve with conditions, or reject it [step 9]. If the Committee approves it with conditions, the Draft Structure Plan will have to be amended and re-submitted for approval. The cycle of public objections will apply again in this case. If the Committee decides to approve the plan, it is then forwarded to the State Authority for assent [step 10], before it is published in the *State Gazette* [step 11].

FIG. 8.2: STRUCTURE PLAN PREPARATION PROCESS IN PENINSULAR MALAYSIA



Immediately after the structure plan is gazetted, it will become the basis for planning and development control in the local planning authority area [step 12].

The Report of Survey and Structure Plan cover issues, strategies, policies and proposals on planning matters or components which are relevant to the planning areas. Generally, but depending on the specific planning areas, the issues could cover any or all of the following sectors [in alphabetical order]:

Agriculture	Infrastructure and Utilities
Commerce	Land use
Economic Framework/Base	Mining
Environment	National and Regional Framework
Finance and Institutions	Population
Fishing	Social and Community Services and Facilities
Forestry	Tourism
Housing	Town Centre
Industry	Transportation and Traffic
	etc.

The multi-sectoral nature of structure plans indicates the comprehensiveness, in theory at least, of consideration of social, economic, and physical environmental conditions during the formulation of strategies, policies and proposals in the structure plan. However it is observed that in all cases, 'environment' is just another sector for consideration; it is not the underlying factor in influencing the plan. However, being included as one of the four national implementing strategies for the environment i.e. the integration of environmental dimension in structure plans, lately this 'sector' gets heavy input from the DOE, either in terms of direct personnel involvement as a study-team member, or by providing data, comments and advice.

To this researcher's knowledge as an officer in the TCPD in Peninsular Malaysia, and from information derived from interviews with land use planners for this thesis, none of the structure plans prepared so far in Malaysia has ever included any formal assessment of environmental impacts of land use proposals. The implication of this observation is examined in section 8.4.

8.3.3 Public participation

The first public participation exercise under Act 172 was in 1982 for the Report of Survey of the Seremban Structure Plan, thus indicating the relatively short history of public participation for structure plans in Malaysia. There is no record of any literature which compiles all public participation exercises under Act 172, and their performance, to date. However Goh [1991] provides some indicators of the extent of public participation in structure plan studies for five towns in the period 1983-1987 [Table 8.3], in which the performance of public participation is measured against the number of population in the towns [Table 8.4].

To assess the current performance in public participation, the public participation performance of five structure plans in the period 1988-1992 [only Kuala Terengganu's Report of Survey was published in 1984] was analysed in terms of the number of comments received [Table 8.5]. The analysis shows an improvement in the performance. On the average there were 356 comments for each ROS and 210 for each DSP. An interesting pattern which shows is that there are less comments on the DSP than on the ROS, with the exception of Kuala

Terengganu. From personal knowledge and experience in the preparation of structure plans, this could be attributed to the result of more enthusiastic and concerted efforts on the parts of the local authorities, the planning team, and the general public at the ROS stage than at the DSP stage. Content-wise, the number of non-relevant views, at 23 % and 37 % for ROS and DSP respectively, are still too high, indicating the need for more education on structure plans for the public.

TABLE 8.3: SOME INDICATORS OF PUBLIC PARTICIPATION UNDER ACT 172 [1983-1987]

Local Authority	No. of copies sold/given *	Price per copy [RM]	No. of memos received
Ipoh	67	40	34
Klang	450	30	21
Johor Bahru	436	40	53
Pulau Pinang	622	40	68
Kuala Lumpur	4860	50	178

* For Kuala Lumpur, the number shows the sale of the Draft Structure Plan, while for the other towns, they show the sale of Reports of Survey.
Source: Goh 1991.

TABLE 8.4: NUMBER OF VISITORS TO PUBLIC EXHIBITIONS UNDER ACT 172 [1983-1987]

Local Authority	No. of visitors	Total Population	% of visitors	Period of exhibition
Ipoh	1,700	350,000	1	1 month
Klang	7,500	312,000	2	1 month
Johor Bahru	11,100	285,400	4	1 month
Pulau Pinang	4,600	498,500	1	1 month
Kuala Lumpur	18,000	977,000	2	37 days

* For Kuala Lumpur, the number shows the sale of the Draft Structure Plan, while for the other towns, they show the sale of Reports of Survey.
Source: Goh 1991.

The above analysis indicates a relative improvement in the public participation performance in structure plans in Malaysia. However, due to the lack of more information, no judgement is made here on its effectiveness, or the impact of public participation on structure plans.

8.3.4 Decision-making and plan-making

The process of plan-making and implementation involves organizations at all levels of governments, namely federal, state and local, as well as the general public. Some authorities are involved through legislation, while others are involved through government administrative machinery. Decision-making process in the preparation of a structure plan is illustrated in Fig. 8.3

TABLE 8.5: CURRENT PUBLIC PARTICIPATION PERFORMANCE IN MALAYSIA

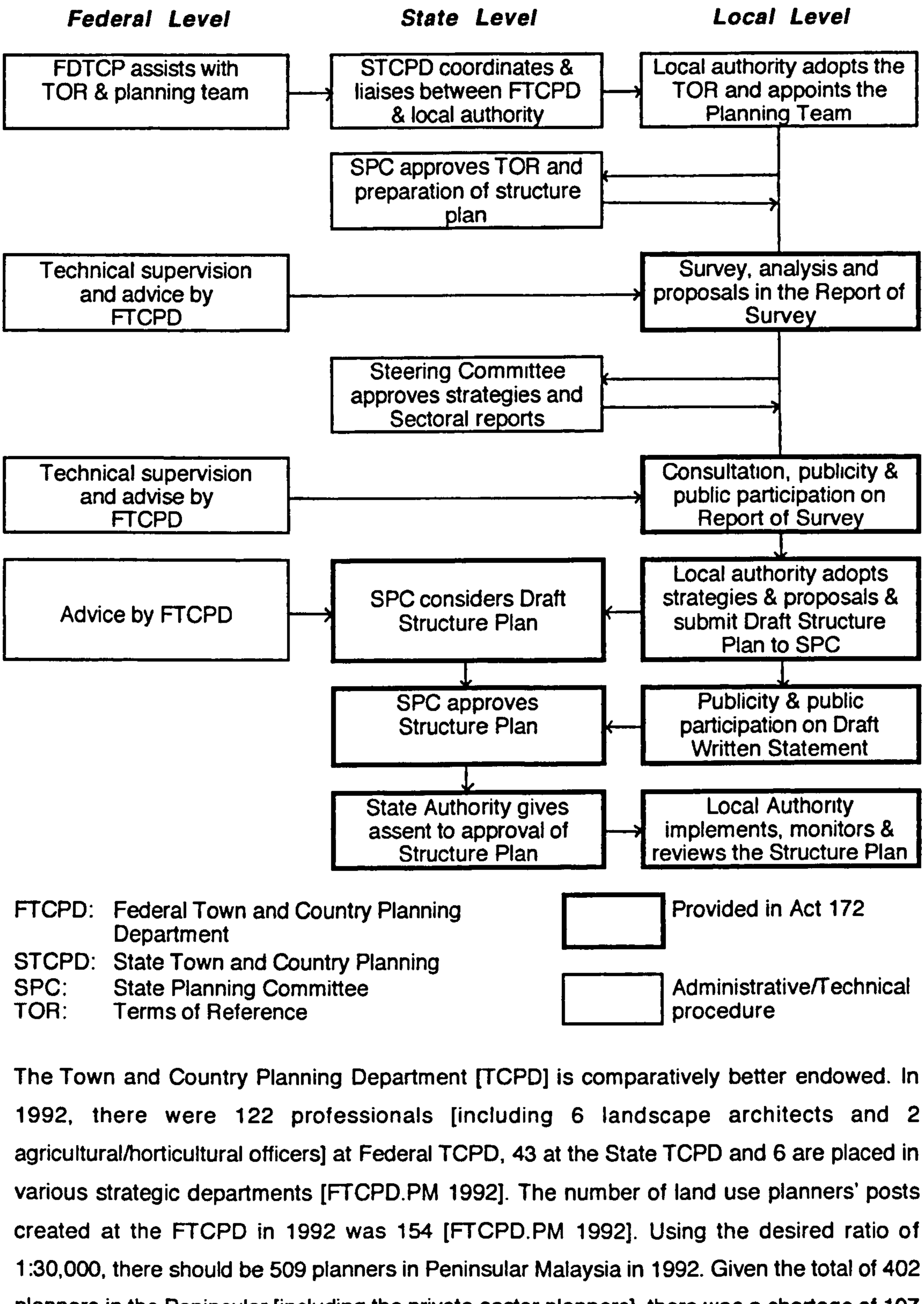
Local Planning Authorities	Type of Reports	Total Comments	AE (%)	TBC (%)	NR (%)
Kuala Terengganu	ROS [1984]	264	45	11	44
	DSP [1988]	194	39	3	58
Kangar	ROS [1987]	252	37	37	26
	DSP [1989]	157	48	9	43
Langkawi	ROS [1990]	238	59	26	15
	DSP [1991]	498	45	24	31
Kuantan	ROS [1991]	890	66	17	17
	DSP [1992]	74	41	36	23
Johor Bahru Tengah	ROS [1990]	130	57	12	31
	DSP [1992]	126	44	25	31
TOTAL	ROS	1774	57	20	23
	DSP	1049	44	19	37
AVERAGE	ROS	355.8	-	-	-
	DSP	209.8	-	-	-

Note: ROS Report of Survey; DSP Draft Structure Plan; AE Already Embodied in Report; TBC To Be Considered; NR Non-relevant Views

Source: Statements on Publicity and Public Participation and Reports on Public Objections from the respective structure plan studies.

Due to the lack of manpower in the local authorities, even the initiative of undertaking the structure planning process is generally taken by the Town and Country Planning Department [TCPD], both at federal and state levels. Table 8.6 illustrates the nearly non-existence of land use planners at the local level in 1986. Only fourteen local authorities have their own land use planners. Even by 1980 population level, the number of planners provide an average ratio of one planner for every 87,926 people. If the desired ratio of 1:30,000 is used [Mohd. Ishak 1988], this would mean a shortage of 87 land use planners, only in these fourteen local authorities. It is noted that until today there is no change in the number of planners in the local authority, and 82 other local authorities are still without any land use planner.

FIG. 8.3: PLANNING AND DECISION-MAKING IN THE PREPARATION OF A STRUCTURE PLAN UNDER ACT 172



The Town and Country Planning Department [TCPD] is comparatively better endowed. In 1992, there were 122 professionals [including 6 landscape architects and 2 agricultural/horticultural officers] at Federal TCPD, 43 at the State TCPD and 6 are placed in various strategic departments [FTCPD.PM 1992]. The number of land use planners' posts created at the FTCPD in 1992 was 154 [FTCPD.PM 1992]. Using the desired ratio of 1:30,000, there should be 509 planners in Peninsular Malaysia in 1992. Given the total of 402 planners in the Peninsular [including the private sector planners], there was a shortage of 107

planners in 1992. Facing this state of affairs in the land use planning manpower situation, TCPD is entrusted with the responsibility of preparing structure plans for the local authorities. This activity is in fact the biggest departmental programme of Federal TCPD since the Fourth Malaysia Plan [TFCPD.PM 1992]. By 1992, TCPD had undertaken 33 structure plan studies [this includes the 'joint structure plans'] which are in various stages of preparation [FTCPD.PM 1992].

TABLE 8.6: LOCAL AUTHORITIES WITH LAND USE PLANNERS

Local Authority	Population @1980	No. of Planners
Kota Setar M.C.	287,476	1
Seberang Perai M.C.	435,526	3
Penang Island M.C.	489,300	5
Ipoh M.C.	300,320	2
Kuala Lumpur City Hall	937,817	24
Klang M.C.	196,209	1
Shah Alam M.C.	24,138	1
Petaling Jaya M.C.	218,331	1
Seremban M.C.	136,252	1
Melaka Tengah M.C.	250,645	1
Johor Bahru M.C.	249,880	1
Kuantan M.C.	136,625	1
Kuala Terengganu M.C.	186,698	1
Kota Bharu M.C.	197,559	2
TOTAL	3,956,686	45

Source: Goh 1991.

Left to their own resources most local authorities would not be able to finance the preparation of structure plans. Therefore external financial assistance is necessary. However in order to ensure their commitment, it is normally required that local authorities contribute at least one-third of the cost of preparation. At the state level, the State TCPD assists in getting finance and in setting up the planning team. Financial assistance come from two sources. The first source is the state government which provides some of the operating expenses and consultant fees [only in some states]. The second source is the federal government. This is channelled through the the Federal TCPD with the approval from EPU. Federal contribution is mainly for consultant fees, although in some cases it covers operational expenses as well [FTCPD.PM 1992].

The Federal TCPD assists in preparing the Terms of Reference [TOR] for the planning exercise and provides the essential manpower for the planning team. The planning team is mainly comprised of land use planners and is headed by a senior planner from the Federal TCPD. Consultants are engaged only for some sectoral studies. The Federal TCPD also provides supervision in the form of a Supervisory Committee which monitors the planning process [Fig. 8.3].

Decision-making in structure planning is crucial at the local level. Although the structure plan is prepared by the Federal TCPD, with planning and coordination input from the State TCPD, the local planning authority is responsible for the adoption of the TOR, the Report of Survey and the Draft Structure Plan. It has to comply with the requirements of Act 172 with respect to publicity, consultation and public participation at the Report of Survey stage as well as at the draft structure plan stage. It is responsible for the draft structure plan which is submitted to the SPC for approval, and once it is approved, is responsible for its implementation and monitoring. Since the local authority does not possess the planning know-how, the State TCPD has made it its responsibility to undertake all these activities.

The State TCPD has four roles: one, as the secretariat to the SPC; two, as the project coordinator; three, as advisor to the local authority; and four, as the 'planning agency' for the local authority. Besides having a regulatory role, the State TCPD also has a supervisory role with the local authorities. In short, while advising the SPC to make decisions on the submissions by local planning authorities, it also assists the Federal TCPD and local authorities in the preparation of the Plan.

The SPC has the most important decision-making role i.e. the approval of structure plans. It is assisted by the Steering Committee which is normally chaired by the State Secretary.

The decision-making activities demonstrate the strong role played by the TCPD, at both federal and state levels. Although the legislative responsibility towards the preparation and implementation of structure and local plans lies with local planning authorities, the TCPD has a strong influence in the operational and planning process. This state of affairs reflects the strong central government influence in plan-making and decision-making in land use planning in Peninsular Malaysia.

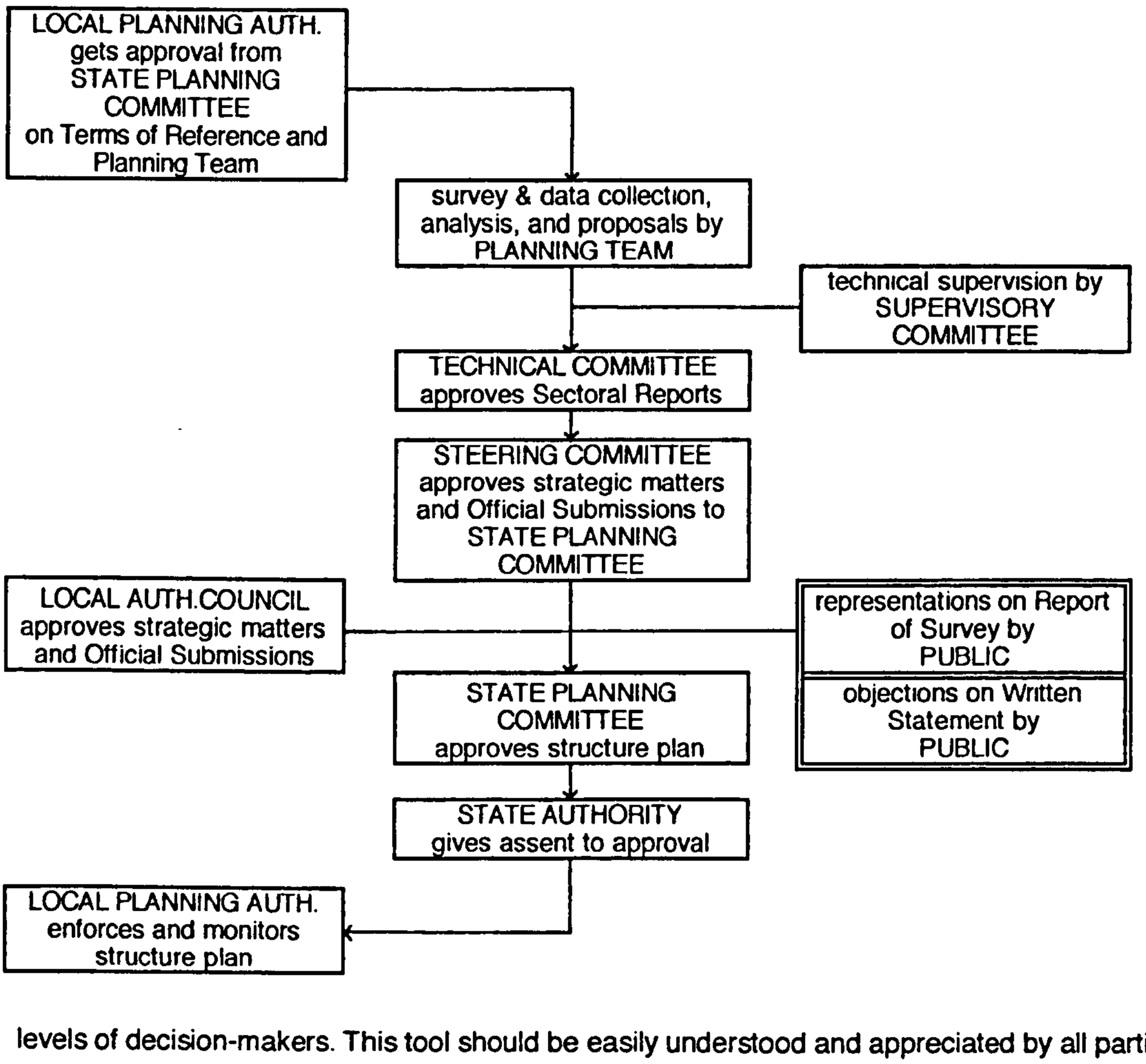
For the purpose of having access to multi-disciplinary expertise, consultation and education for the structure plan, plan-making as well as decision-making involves a big number of departments, organizations and committees, which are responsible in one way or another, for decision-making at each stage of the planning process. The organizations include:-

The Local Planning Authority
The Planning Team
The Project Coordinator
The Supervisory Committee
The Technical Committee
The Steering Committee
The Public Representations Committee
The Public Objections Committee
The State Planning Committee
The State Authority

The involvement of such a big number of agencies, organisations and committees in the preparation of a structure plan means that at every stage of the process, there is ensured a period of informal and formal consultation, followed by decision-making. The hierarchy of decision-making can be identified from the hierarchy in the committee system which is adopted, as shown in Fig.8.4.

If land use planning is accepted as a management of environmental change, and if it is also accepted as environmental planning and management while streamlining sustainable development, then there is a need for a systematic tool for decision-making for all groups and

FIG. 8.4: THE DECISION-MAKING HIERARCHY IN THE PREPARATION OF A STRUCTURE PLAN IN PENINSULAR MALAYSIA



levels of decision-makers. This tool should be easily understood and appreciated by all parties concerned. The ultimate aim of the tool is to ensure that while the goal of development is to achieve social and economic aspirations of the people, these should not be at the expense of the environment and the future generations. The tool to be used should highlight to decision-makers the various impacts of different development strategies, policies and proposals, so that each and every one of them understand the implications of decisions at the various levels of the planning process.

8.4 PERFORMANCE IN SUSTAINABLE DEVELOPMENT

8.4.1 Introduction

This section describes the performance of Malaysian structure plans in planning for sustainable development. The performance level is determined by the assessment of four Malaysian structure plans which have been selected as case studies [see Chapter 1]. The indicator that is used is a set of land use planning criteria which are identified as criteria for achieving sustainable development. The exercise involves:

1. Identification of land use planning criteria for sustainable development;
2. Assessment of the structure plans for their consideration of the above criteria;
3. Determination of performance levels of each plan;
4. Evaluation of performance levels.

8.4.2 Identification of criteria

Table 8.7 shows the land use planning criteria for sustainable development. These criteria are grouped according to sustainable development issues to which they are most related. As an example, criteria 1-5 are for the 'resource conservation' issue, and criteria 6-20 are for the 'built environment in harmony with natural environment' issue. The sustainable development issues are derived from an examination of the sustainable development concept in Chapter 2, while the criteria have been especially identified in this exercise. They are based on land use planning principles which are discussed in Chapter 3, within the context of sustainable development principles. Hence they are called *land use planning criteria for sustainable development*. There are altogether 125 land use planning criteria for sustainable development, grouped under 16 sustainable development issues.

The criteria have been identified from the analyses of planning legislation, manuals, guidelines and other literature on developments in land use planning for sustainable development, and environmental consideration and appraisal of development plans. From Malaysia, particular reference is made to *Act 172*, the *Town and Country Planning Act 1976* *Development Plans [Structure and Local Plans] Rules 1985*, and a paper by TCPD [1987] titled *Data Collection for Structure Plan: Problems and Recommendations*. Since the English structure plan is the 'model' for Malaysian structure plans, many land use planning documents in the UK have been analysed. Of particular importance are *Policy Appraisal and the Environment* [DoE.UK. 1991], *PPG 12* [DoE.UK. 1992a], and *Development Plans: A Good Practice Guide* [DoE.UK 1992b]. These are supplemented by the examination of *The Planning Balance in the 1990s* [Tromans 1991], and structure planning studies which have been widely acknowledged to have strong environmental assessment component, namely

TABLE 8.7: CONSIDERATION FOR SUSTAINABLE DEVELOPMENT IN MALAYSIAN STRUCTURE PLANS - AN ASSESSMENT OF FOUR STRUCTURE PLANS ... [1 OF 6]

	LANDUSE PLANNING CRITERIA FOR SUSTAINABLE DEVELOPMENT	Muar Selatan Structure Plan				Petaling and Klang [part] Districts StructurePlan				Melaka City Structure Plan				Langkawi Island Structure Plan			
		O	S	P	J	O	S	P	J	O	S	P	J	O	S	P	J
	GOALS OF SUSTAINABLE DEVELOPMENT																
	Resource conservation																
1	*efficient use of land*	x				x	x	x	x	x			x	x			
2	*maintenance of biological diversity*																
3	*conservation of natural beauty and amenity of land*		x	x	x		x		x	x				x	x	x	x
4	*conservation of green belt to prevent urban sprawl*		x	x	x		x	x	x							x	x
5	*exploitation of minerals/resources which considers the need of future generations*															x	x
	Built environment in harmony with natural environment																
6	balance and mutual enhancement of built and natural environments		x	x	x	x	x	x	x	x		x	x	x	x	x	x
7	*pattern and type of development which considers the environment*		x	x	x	x	x	x	x	x		x	x	x	x	x	x
8	safe and efficient transportation system			x	x	x	x	x	x	x	x	x	x	x	x	x	x
9	development that include flood defence and land drainage			x	x			x	x	x		x	x	x		x	x
10	*development that protects water quality*			x	x	x		x	x	x		x	x			x	x
11	development that takes account of location of hazardous installations			x	x			x	x	x			x				x
12	special actions on estuaries and coastlines			x	x	o	o	o	o	x		x	x	x	x	x	x
13	design, scale and type of materials used harmonise with the surroundings			x	x			x	x	x		x	x	x		x	x
14	new developments maintain or enhance existing landscape			x	x		x	x	x	x		x	x			x	x
15	presumption against development on forest land		x	x	x		x	x	x			x	x			x	x
16	*balance new development with need to conserve and enhance worthwhile features*		x	x	x		x			x		x	x	x			x
17	*fully integrated urban and rural strategic guidelines that relate to environmental policies*		x	x	x	x	x	x	x				x	x	x	x	x
18	*integrate use and design strategies of scientific, wildlife, historic and scenic areas*		x	x	x		x	x	x			x	x			x	x
19	urbanisation blends gently with the countryside			x	x		x	x	x							x	x
20	increase green open space in urban areas						x	x	x	x		x	x		x		x

Note: Area of context: O = Objectives; S = Strategies; P = Policies; J = Proposals/Justification; x = Have been considered/included; o = irrelevant.
Criteria which have not been considered, or have been insufficiently considered in the structure plans are emphasised in *italics*.

TABLE 8.7: CONT. [2 OF 6]

	LANDUSE PLANNING CRITERIA FOR SUSTAINABLE DEVELOPMENT	Muar Selatan Structure Plan				Petaling and Klang [part] Districts StructurePlan				Melaka City Structure Plan				Langkawi Island Structure Plan			
		O	S	P	J	O	S	P	J	O	S	P	J	O	S	P	J
	Environmental quality.																
21	*prevent developments that are detrimental to human health*							x	x								
22	prevent developments that diminish the quality of life	x	x	x	x	x		x	x	x		x	x			x	x
23	improve the physical environment			x	x	x	x	x	x			x	x		x	x	x
24	preserve green belts around urban areas/ concentrated dispersal		x	x	x		x	x	x	o	o	o	o			x	x
25	proper sewerage system			x	x			x	x	x		x	x	x	x	x	x
26	reclamation of derelict lands and buildings			x	x			x	x	x		x	x	x	x	x	x
27	maintain/enhance landscape quality			x	x		x	x	x	x		x	x	x	x	x	x
28	presumption against conflicting uses			x	x		x	x	x	x	x	x	x	x	x	x	x
29	presumption against polluting activities			x	x			x	x	x	x	x	x		x	x	x
30	*facilities for walking and cycling to reduce fuel emissions*				x												x
31	*settlement patterns which reduces car journeys and distances travelled*																
32	*settlement patterns which permit choice of more energy-efficient public transport*															x	x
33	bring vacant and derelict land into use more quickly			x	x			x	x	x		x	x		x	x	x
34	protect and enhance environment regarded as high quality and improve a poor one			x	x		x	x	x			x	x	x	x	x	x
35	self-sufficiency for industrial and household waste disposal and reduce landfills			x	x			x	x	x		x	x	x	x	x	x
	Social equality.																
36	*prevent developments that increase the gap between the rich and the poor*																
37	encourage developments that reduce social inequality [NEP/NDP objectives]		x	x	x			x	x			x	x	x	x	x	x
38	provide adequate land to meet housing need and demand			x	x	x	x	x	x	x		x	x	x		x	x
39	positive relationship with social needs/problems including impacts on different groups			x	x		x	x	x	x		x	x	x	x	x	x
40	land uses consider social benefits in terms of jobs and facilities			x	x		x	x	x	x		x	x	x	x	x	x
	PRINCIPLES OF SUSTAINABLE DEVELOPMENT SOCIETY																
	Respect and care for community of life																
41	*present developments not at the expense of future generations*																
42	developments that do not threaten the survival of other groups			x	x			x	x	x			x	x		x	x

Note: Area of context: O = Objectives; S = Strategies; P = Policies; J = Proposals/Justification; x = Have been considered/included; o = irrelevant.
Criteria which have not been considered, or have been insufficiently considered in the structure plans are emphasised in *italics*.

TABLE 8.7: CONT. [3 OF 6]

	LANDUSE PLANNING CRITERIA FOR SUSTAINABLE DEVELOPMENT	Muar Selatan Structure Plan				Petaling and Klang [part] Districts StructurePlan				Melaka City Structure Plan				Langkawi Island Structure Plan			
		O	S	P	J	O	S	P	J	O	S	P	J	O	S	P	J
43	*developments that do not threaten survival of other species/groups or eliminate their habitats*				x				x						x		x
44	everyone has equal access to employment and facilities [NEP/NDP objectives]			x	x			x	x	x		x	x	x		x	x
45	enhance the character of the city			x	x			x	x	x	x	x	x	x	x	x	x
	Improve quality of human life																
46	promote economic development	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x
47	provision of tourism, leisure and recreation facilities		x		x	x	x	x	x	x	x	x	x	x	x	x	x
48	provision of infrastructure eg. education, health care, roads, sewers	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
49	*transportation system which reduces pollutions and provide safety and convenience*					x	x			x	x			x		x	x
50	safeguard and improve the amenity of residential districts			x	x	x	x	x	x	x	x	x	x	x	x	x	x
51	*control pollution, limit and reduce nuisances such as noise, smells and dust*			x	x	x	x	x	x	x	x	x	x	x	x	x	x
52	*bring together land use and transportation policies*			x	x	x	x	x	x	x		x	x			x	x
53	*provide open space in congested urban areas*						x	x	x				x				
54	*pedestrian-vehicle separation*			x	x			x	x	x	x	x	x	x		x	x
55	*cycle-priority routes*																x
56	provide choices of houses, jobs, shops, services and other facilities, without requiring a significant increase in the distances travelled	x		x	x	x	x	x	x	x	x	x	x			x	x
57	*avoid developments which provide risks of life and health*															x	x
58	improvement of rural housing	x		x	x	x		x	x	o	o	o	o	x		x	x
59	consideration for special needs - elderly, disabled, homeless, economically deprived			x	x			x	x			x	x			x	x
	Conserve earth's vitality and diversity																
60	encourage conservation-based development		x	x	x		x			x		x	x	x	x	x	x
61	*conserve biodiversity by conservation of natural habitats*			x	x		x								x	x	x
62	*sustainable uses of renewable resources*					x											x
63	*presumption against developments which would result in ecological losses*			x	x		x					x	x		x	x	x
64	developments are made with special consideration to: - noise			x	x		x					x	x			x	x
65	*- air and atmosphere*			x	x		x	x	x	x		x	x			x	x

Note: Area of context: O = Objectives; S = Strategies; P = Policies; J = Proposals/Justification; x = Have been considered/included; o = irrelevant.
Criteria which have not been considered, or have been insufficiently considered in the structure plans are emphasised in *italics*.

TABLE 8.7: CONT. [4 OF 6]

	LANDUSE PLANNING CRITERIA FOR SUSTAINABLE DEVELOPMENT	Muar Selatan Structure Plan				Petaling and Klang [part] Districts StructurePlan				Melaka City Structure Plan				Langkawi Island Structure Plan			
		O	S	P	J	O	S	P	J	O	S	P	J	O	S	P	J
66	*- water resources*			x	x			x	x	x		x	x			x	x
67	*- water bodies*			x	x			x	x	x		x	x			x	x
68	*- soil*																
69	*- geology*																
70	*- climate*															x	x
71	*- energy*			x	x			x	x			x	x			x	x
72	- human beings	x		x	x			x	x	x		x	x		x	x	x
73	- cultural heritage			x	x					x	x	x	x	x	x	x	x
74	*- other living organisms*													x		x	x
	Minimise depletion of non-renewable resources																
75	*recycling or by substitution of renewable resources where possible*																
76	*long-term programme for minerals exploitation*																
77	preservation of special upland areas as nature reserve or for recreation			x	x			x	x			x	x			x	x
	Keep development within Earth's carrying capacity																
78	*population level that balance with nature's capacity*																
79	utilise most versatile agricultural land for food production	x	x	x			x								x	x	x
	Change personal attitudes and practices																
80	promote local pride by conserving and enhancing natural and built heritage				x				x		x	x	x	x	x	x	x
81	designation of Areas of Special Value	x	x	x				x	x	x	x	x	x	x		x	x
82	protection of historic buildings		x	x						x	x	x	x	x	x	x	x
83	protection of natural features	x	x	x				x	x	x		x	x	x	x	x	x
84	protection of features of ecological and archaeological importance	x	x	x				x	x	x	x	x	x	x	x	x	x
85	enhance the fabric and appearance of the environment		x	x				x	x	x		x	x	x	x	x	x
	Provide framework for integrating development and environment.																
86	*through foundation of information and knowledge*																

Note: Area of context: O = Objectives; S = Strategies; P = Policies; J = Proposals/Justification; x = Have been considered/included; o = irrelevant.
Criteria which have not been considered, or have been insufficiently considered in the structure plans are emphasised in *italics*.

TABLE 8.7: CONT. [5 OF 6]

LANDUSE PLANNING CRITERIA FOR SUSTAINABLE DEVELOPMENT	Muar Selatan Structure Plan				Petaling and Klang [part] Districts StructurePlan				Melaka City Structure Plan				Langkawi Island Structure Plan			
	O	S	P	J	O	S	P	J	O	S	P	J	O	S	P	J
87 through law and institution			x	x		x	x	x	x		x	x	x		x	x
88 through consistent economic and social policies			x	x		x	x	x	x		x	x	x		x	x
89 strategic transport and highway facilities			x	x	x	x	x	x	x		x	x		x	x	x
90 interpret national/regional development policies/objectives for the local strategy		x	x	x		x	x	x	x	x	x	x	x	x	x	x
91 *interpret national/regional environmental policies/objectives for local development*						x	x	x	x	x		x	x	x		x
92 *references to strategies, policies or proposals of other agencies/authorities which are related to the environment*			x	x		x	x	x			x	x			x	x
93 clear reference and consideration of strategies and actions of neighbouring authorities and agencies			x	x		x	x	x			x	x			x	x
94 clear relations with other types of plans				x		x	x	x				x				x
95 *planning the Sustainable City Region in which consideration for resources, densities and urban forms is made for the region instead of just for one settlement or city/town*		x	x	x	x	x	x	x	x			x			x	x
STRATEGIC IMPERATIVES FOR SUSTAINABLE DEVELOPMENT																
Revive growth.																
96 stimulate and revitalise urban economic growth and employment opportunities	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
97 stimulate the rural economy		x	x	x		x							x	x	x	x
98 new industries, business, retail and other employment-generating and wealth creating developments		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
99 strategic transportation network which considers economy and environment		x	x	x	x	x				x				x	x	x
100 urban regeneration			x	x					x		x	x		x	x	x
101 indication of priorities for types of economic development		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
102 maintain character and vitality of town centres and older urban areas			x	x					x	x	x	x		x	x	x
103 *comprehensive rural development strategy which complements urban development*		x	x	x		x			x		x	x	x	x	x	x
Change the quality of growth.																
104 *sustainability, equity, social justice, and security as part of major social goals*	x					x	x	x	x				x			
105 *traffic calming through traffic management*			x	x	x	x	x	x	x		x	x				
106 *land use-transportation integrated planning which benefits residents and business*			x	x	x	x			x		x	x		x	x	x

Note: Area of context: O = Objectives; S = Strategies; P = Policies; J = Proposals/Justification; x = Have been considered/included; o = irrelevant.
Criteria which have not been considered, or have been insufficiently considered in the structure plans are emphasised in *italics*

TABLE 8.7: CONT. [6 OF 6]

LANDUSE PLANNING CRITERIA FOR SUSTAINABLE DEVELOPMENT	Muar Selatan Structure Plan				Petaling and Klang [part] Districts StructurePlan				Melaka City Structure Plan				Langkawi Island Structure Plan			
	O	S	P	J	O	S	P	J	O	S	P	J	O	S	P	J
107 *growth that is related to public transport networks*			x	x		x	x	x	x		x	x	x		x	x
108 location of new developments that attract trips at points which are capable of acting as nodes for public transport networks			x	x		x	x	x				x	x			x
109 *limitations in town centre car parking*			x	x		x										
110 appropriate interchange opportunities between major public transport networks							x	x					x		x	x
111 maintain and enhance open space			x	x		x	x	x			x	x			x	x
112 balance between the provision of new improved highways, use of traffic arrangement techniques, provision of transport services			x	x	x	x	x	x	x			x	x		x	x
Conserve and enhance the resource base.																
113 *conserve environmental resources such as clean air, water, forests, soils*						x	x	x						x	x	x
114 *maintain genetic diversity*																
115 *use energy, water, and raw materials efficiently*							x	x				x			x	x
116 *agricultural land of high productivity are protected*						x							x		x	x
117 *less valuable land are assessed for more beneficial use*			x	x											x	x
118 *planning guidelines for hill lands and forest lands on the urban fringe*												x		x	x	x
119 *more positive about the consequences on the demand for water of future land uses*							x	x								
Ensuring a sustainable level of population																
120 *population policies integrated with economic and social development programmes such as education, health care*																
121 *expand the livelihood of the poor with more employment opportunities*														x		
Integrate environment and economics in decision-making.																
122 *Plan that is realistic with resources*						x			x							
123 *focus on environmental damage rather than on the symptoms*														x		x
124 *plan is within resource context, development and market conditions*						x			x				x		x	x
125 *a realistic plan in resource context and financial abilities of implementing agencies*						x			x							

Note: Area of context: O = Objectives; S = Strategies; P = Policies; J = Proposals/Justification; x = Have been considered/included; o = irrelevant.
Criteria which have not been considered, or have been insufficiently considered in the structure plans are emphasised in *italics*.

the *Cheshire County Structure Plan Including the First Alteration* and its *Explanatory Memorandum* [Cheshire County Council 1986a and 1986b respectively], and *Cheshire 2001* [Cheshire County Council 1990].

Other documents include the *Lancashire Report on the Environmental Appraisal of the 1986-1996 Structure Plan* [Lancashire County Council 1993], and the *Report on the Strategic Environmental Appraisal of Policies of Kent Structure Plan* [Kent County Council 1993]. These are supplemented by results of studies which include the *Cycle Routes* [Harland 1992], *Cycling and the Promotion of Health* [Hillman 1992], *City-wide Traffic Calming Through Urban Reorganization* [Brindle 1992], *Measuring the Environmental Impact of Road Traffic* [Klæboe 1992], *Comparing Transport Energy Consumption by Mode and Settlement Patterns* [Barrister 1992], and *Land Use and Travel Demand* [Roberts and Wood 1992].

8.4.3 Assessment of plans

The assessment follows a simple procedure whereby the plans' performance in sustainable development is determined by the level of consideration which is *indicated to have been given to sustainable development issues in the plans*. The analysis provides an indication of the degree of consideration given to sustainable development issues in the formulation of these instruments in the plans; and indirectly an indication of the use of types of data and level of analyses on these issues. Although sustainable development encompasses all aspects of environment and development, it is represented, in this analysis, by the 'land use planning criteria for sustainable development'.

The assessment is based on a content-analysis of the case studies. Using the set of criteria, an assessment is made on the contents of each plan [with reference to the respective report of survey when necessary], without any reference to the planning process or activities, or any other sources which may provide information which is related to environmental appraisal or consideration of sustainable development. The exercise also excludes the role of public participation in the planning process, although this is accepted as a conceptual key issue for sustainable development in Chapter 6.

This simple assessment approach is adopted in order to assess the plans from the view of a member of the public who is an 'outsider', and who does not have the 'inside information' on planning activities, other than structure plans and reports of survey which are made available to them. This is considered to be a rational approach, based on the assumption that if there has been any consideration of 'sustainable development issues', then it should have been indicated or reflected in the plans, since the objectives of planning are first to obtain public input in the planning process, and then to assist in decision-making.

Following the argument that environmental assessment has a dual role i.e. as a plan-making tool and a decision-making instrument, and that there is a very strong link between environmental assessment and sustainable development [see Chapter 4], if any assessment is made for sustainable development purposes, then the result should be communicated in the reports, since the report of survey is for plan-making and the structure plan is for decision-making.

The assessment is made by using a simple matrix which has 'land use planning criteria for sustainable development' in the vertical axis [rows], and the plan's 'objective [O]; strategy [S]; policy [P]; proposal/justification [J]' in the horizontal axis [columns], as shown in Table 8.7. Then for each cell in the matrix, a 'x' is made if each criterion has been *indicated [in the form of statements] by at least one* objective or strategy or policy or proposal in the plan.

For examples in Table 8.7, criterion 1 [efficient use of land] is mentioned in the statement of objective in the Muar Plan, and hence a 'x' is made in the cell [the statement of objective is: "to ensure that land, which is a limited development resource in MDMS is used at an optimum level"]. However, the criterion is not mentioned or indicated in the plan's statements of strategy, policies or proposals, and hence the cells are left empty. 'x's are made in the cells under 'S' and 'P' for Petaling because its statement of strategy includes "efficient use of land towards more effective development", and one of its policies states that "all developments must be coordinated with the transportation system, to produce a rational pattern of land uses". The 'x' under 'J'[Proposal] for Melaka is because the plan proposes that "in order to control, guide and rationalise planning and development in MPMBB, four categories of development areas have been identified". Nevertheless, all the examples do not clearly mention or refer to resource conservation, which is the sustainable development issue concerned. The same assessment is made for every cell in the matrix.

8.4.4 The determination of performance levels

The performance levels are determined by two methods which produce four options. The two methods are:

METHOD 1:

The indicator is the *number of criteria* that are *clearly indicated to have been considered in at least one policy, proposal, strategy, or objective* in the plans, as a percentage of the total number of criteria.

METHOD 2:

The indicator is the number of instances [represented by the number of cells with 'x' in the matrix] that are considered by at least one policy, proposal, strategy or objective, as a percentage of the maximum possible instances [represented by the

total number of cells in the matrix] if they are considered by all policies, proposals, strategies and objectives. There are three options in this method:

Option A: Policies, proposals, strategies and objectives have equal priorities in terms of plan effectiveness. In this option policies, proposals, strategies and objectives are assigned an equal weight of 1 [one].

Option B: Policies are the main priorities in terms of plan effectiveness. Weights which are consistent with their descending order of importance are assigned: 8 for policies; 4 for proposals; 2 for strategies; and 1 for objectives.

Option C: Strategies are the main priorities in terms of plan effectiveness. Weights which are consistent with their descending order of importance are assigned: 8 for strategies; 4 for objectives; 2 for policies; and 1 for proposals.

Method 1: Performance by the number of clearly considered criteria

The content-analyses of plans indicate that the number of criteria that are clearly indicated to have been considered is low. Out of 125 land use planning criteria for sustainable development that are looked for in the plans, only 63 i.e. 50.0% are largely clearly indicated or mentioned in all plans. The rest are not consistently mentioned or referred to. These criteria are highlighted in *italics* in Table 8.7. Examples are Criteria 1-5 and 7. From Table 8.8, it is concluded that for sustainable development goals, only 62.5% of the land use planning criteria are clearly referred to or mentioned; for sustainable development society principles, it is only 49.1%; and for strategic imperatives for sustainable development, only 36.7% are referred to or mentioned.

From this analysis, if the number of land use planning criteria for sustainable development that are *clearly referred* to is used as an indicator of the plans' performance in sustainable development, then the level of performance can be concluded as follows: 62.5% for sustainable development goals; 49.1% for sustainable development society; and 36.7% for strategic imperatives for sustainable development. The overall performance is 50.0%.

Method 2:Performance according to priorities of planning instruments

In this method the 'performance scores' for each plan are calculated by assigning the respective weights to the 'x's in Table 8.7 and calculating them as a percentage of maximum possible scores for each sustainable development issue. As an example, for 'resource conservation' in Table 8.7, the score for Muar Selatan is obtained by adding the scores in all the cells against criteria 1-5, which are the land use planning criteria for this issue; and for 'built environment in harmony with natural environment', the score for Muar Selatan is obtained by adding the scores in all the cells against criteria 6-20. The three sets of weights in Options A, B and C are assigned, producing three sets of performance levels which are shown in Tables 8.9, 8.10 and 8.11.

TABLE 8.8: LAND USE PLANNING CRITERIA FOR SUSTAINABLE DEVELOPMENT THAT ARE CLEARLY CONSIDERED IN STRUCTURE PLANS IN MALAYSIA-METHOD 1

SUSTAINABLE DEVELOPMENT ISSUES	No. of landuse planning criteria	Clarity in consideration	
		No	%
Sustainable development goals	40	25	62.5
• Resource conservation	5	0	00.0
• Natural and built environment in harmony	15	10	66.7
• Achieve acceptable environmental quality	15	11	73.3
• Achieve social equality	5	4	80.0
Sustainable development society principles	55	27	49.1
• Respect and care for community of life	5	3	60.0
• Improve quality of human life	14	7	50.0
• Conserve earth's vitality and diversity	15	4	26.7
• Minimise depletion of non-renewable resources	3	1	33.3
• Keep development in Earth's carrying capacity	2	1	50.0
• Change personal attitudes and practices	6	5	83.3
• Framework for integrating development and environment	10	6	60.0
Strategic imperatives for sustainable development	30	11	36.7
• Revive growth	8	7	87.5
• Change quality of growth	9	4	44.4
• Conserve and enhance the resource base	7	0	00.0
• Ensuring a sustainable level of population	2	0	00.0
• Integrate environment in economics in decision-making	4	0	00.0
OVERALL PERFORMANCE	125	63	50.0

The tables show that performance levels are measured by taking the scores for each sustainable issue as a percentage of the possible maximum score [if all criteria are considered by all policies, proposals, strategies and objectives, and assigned the respective weights].

8.4.5 Performance levels

Table 8.8 shows the performance level from Method 1 and Table 8.12 shows the performance levels from Method 2, while Table 8.13 summarises the performance levels of the plans in rank order which is determined by percentage scores.

Salient features

The assessment of performance of the four structure plans in sustainable development identified several salient features. The main feature is that the overall performance levels are generally low [below 60%] regardless of the method or option that is used, but there is a very small difference between average performance levels from Method 1 [50.0%] and Option A of Method 2 [50.8%], and a big difference between the average performance level from Option B [59.4%] and that from Option C [40.2%] .

TABLE 8.9: SUSTAINABLE DEVELOPMENT PERFORMANCE SCORES OF FOUR MALAYSIAN STRUCTURE PLANS - METHOD 2 OPTION A [EQUAL PRIORITIES OF POLICIES, PROPOSALS, STRATEGIES, OBJECTIVES]

SUSTAINABLE DEVELOPMENT ISSUES	MAX SCORE FOR FOUR PLANS	MAX SCORE PER PLAN	Muar Selatan Structure Plan		Petaling and Klang [part] Structure Plan		Melaka City Structure Plan		Langkawi Island Structure Plan		AVERAGE	
			Score	%	Score	%	Score	%	Score	%	Score	%
Sustainable development goals												
• Resource conservation	80	20	7	35.0	9	45.0	3	15.0	9	45.0	28	35.0
• Natural and built environment in harmony	240	60	34	56.7	45	75.0	38	63.3	41	68.3	158	65.8
• Achieve acceptable environmental quality	240	60	26	43.3	31	51.7	34	56.7	40	66.7	131	54.6
• Achieve social equality	80	20	9	45.0	12	60.0	11	55.0	15	75.0	47	58.8
	640	160	76	47.5	97	60.6	86	53.8	105	65.6	364	56.9
Sustainable development society principles												
• Respect and care for community of life	80	20	7	35.0	7	35.0	9	45.0	12	60.0	35	43.8
• Improve quality of human life	224	56	26	46.4	40	71.4	35	62.5	38	67.9	139	62.1
• Conserve earth's vitality and diversity	240	60	22	36.7	16	26.7	25	41.7	33	55.0	96	40.0
• Minimise depletion of non-renewable resources	48	12	2	16.7	2	16.7	2	16.7	2	16.7	8	16.7
• Keep development in Earth's carrying capacity	32	8	3	37.5	1	12.5	0	0.0	3	37.5	7	21.9
• Change personal attitudes and practices	96	24	14	58.3	9	37.5	21	87.5	23	95.8	67	69.8
• Framework for integrating development and environment	160	40	17	42.5	29	72.5	23	57.5	23	57.5	92	57.5
	880	220	91	41.4	104	47.3	115	52.3	134	60.9	444	50.5
Strategic imperatives for sustainable development												
• Revive growth	128	32	23	71.9	16	50.0	23	71.9	29	90.6	91	71.1
• Change quality of growth	144	36	15	41.7	25	60.4	15	41.7	17	47.2	72	50.0
• Conserve and enhance the resource base	96	24	2	8.3	8	33.3	2	8.3	13	54.2	25	26.0
• Ensuring a sustainable level of population	32	8	0	0.0	0	0.0	0	0.0	1	12.5	1	3.1
• Integrate environment in economics in decision-making	64	16	0	0.0	3	18.8	3	18.8	5	31.3	11	17.2
	464	116	40	34.5	52	44.8	43	37.1	65	56.0	200	43.1
OVERALL PERFORMANCE	1984	496	207	41.7	253	51.0	244	49.2	304	61.3	1008	50.8

Note:

The scores are calculated by adding all cells [in Table 8.8] which indicate occurence of consideration of land use planning criteria for sustainable development, and then total them up by each sustainable development issue. The performance of each plan is indicated by the % of scores out of the total possible maximum score if all criteria are considered by at least one policy, proposal, strategy and objective.

Max Score per plan = Total score if all criteria in Table 8.8 are considered by at least one policy, proposal, strategy and objective;
Max Score for four plans = Max Score per plan multiplied by 4.

TABLE 8.10: SUSTAINABLE DEVELOPMENT PERFORMANCE SCORES OF FOUR MALAYSIAN STRUCTURE PLANS - METHOD 2 OPTION B [POLICIES ARE THE MAIN PRIORITIES, FOLLOWED BY PROPOSALS, STRATEGIES, OBJECTIVES]

SUSTAINABLE DEVELOPMENT ISSUES	MAX SCORE FOR FOUR PLANS	MAX SCORE PER PLAN	Muar Selatan Structure Plan		Petaling and Klang [part] Structure Plan		Melaka City Structure Plan		Langkawi Island Structure Plan		AVERAGE	
			Score	%	Score	%	Score	%	Score	%	Score	%
Sustainable development goals												
• Resource conservation	300	75	29	38.7	35	46.7	6	8.0	40	53.3	110	36.7
• Natural and built environment in harmony	900	225	180	80.0	196	87.1	165	73.3	120	53.3	661	73.4
• Achieve acceptable environmental quality	900	225	141	62.7	156	69.3	147	65.3	172	76.4	616	68.4
• Achieve social equality	300	75	50	66.7	55	73.3	51	68.0	58	77.3	214	71.3
	2400	600	400	66.7	442	73.7	369	61.5	390	65.0	1601	66.7
Sustainable development society principles												
• Respect and care for community of life	300	75	40	53.3	40	53.3	33	44.0	47	62.7	160	53.3
• Improve quality of human life	840	210	122	58.1	159	75.7	150	71.4	166	79.0	597	71.1
• Conserve earth's vitality and diversity	900	225	123	54.7	71	31.6	100	44.4	161	71.5	455	50.6
• Minimise depletion of non-renewable resources	180	45	12	26.7	12	26.7	12	26.7	12	26.7	48	26.7
• Keep development in Earth's carrying capacity	120	30	14	46.7	2	6.7	0	0.0	14	46.7	30	25.0
• Change personal attitudes and practices	360	90	70	77.8	52	57.8	85	94.4	88	97.8	295	81.9
• Framework for integrating development and environment	600	150	92	61.3	128	85.3	94	62.7	102	68.0	416	69.3
	3300	825	473	57.3	464	56.2	474	57.5	590	71.5	2001	60.6
Strategic imperatives for sustainable development												
• Revive growth	480	120	109	90.8	52	43.3	88	73.3	117	97.5	366	76.3
• Change quality of growth	540	135	85	63.0	103	76.3	61	45.2	71	52.6	320	59.3
• Conserve and enhance the resource base	420	105	12	11.4	40	38.1	8	7.6	65	61.9	125	29.8
• Ensuring a sustainable level of population	116	29	0	0.0	0	0.0	0	0.0	2	6.9	2	1.7
• Integrate environment in economics in decision-making	228	57	0	0.0	6	10.5	3	5.3	19	33.3	28	12.3
	1784	446	206	46.2	201	45.1	160	35.9	274	61.4	841	47.1
OVERALL PERFORMANCE	7484	1871	1079	57.7	1107	59.2	1003	53.6	1254	67.0	4443	59.4

The scores are calculated by applying respective weights to each cell [in Table 8.8] which indicates an occurence of consideration of land use planning criteria for sustainable development, and then total them up by each sustainable development issue. The performance of each plan is indicated by the % of scores out of the total possible maximum score if all criteria are considered by at least one policy, proposal, strategy and objective.

The respective weights are in order of emphasis given to the present plans:

Policies = 8; Proposals = 4; Strategies = 2; Objectives = 1; Max Score per plan = Total score if all criteria in Table 8 8 are considered by at least one policy, proposal, strategy and objective; Max Score for four plans = Max Score per plan multiplied by 4.

TABLE 8.11: SUSTAINABLE DEVELOPMENT PERFORMANCE SCORES OF FOUR MALAYSIAN STRUCTURE PLANS - METHOD 2 OPTION C [STRATEGIES ARE GIVEN PRIORITIES, FOLLOWED BY OBJECTIVES, POLICIES, PROPOSALS]

SUSTAINABLE DEVELOPMENT ISSUES	MAX SCORE FOR FOUR PLANS	MAX SCORE PER PLAN	Muar Selatan Structure Plan		Petaling and Klang [part] Structure Plan		Melaka City Structure Plan		Langkawi Island Structure Plan		AVERAGE	
			Score	%	Score	%	Score	%	Score	%	Score	%
Sustainable development goals												
• Resource conservation	300	75	26	34.7	35	46.7	9	12.0	25	33.3	95	31.7
• Natural and built environment in harmony	900	225	90	40.0	154	68.4	90	40.0	119	52.9	453	50.3
• Achieve acceptable environmental quality	900	225	55	24.4	84	37.3	93	41.3	133	59.1	365	40.6
• Achieve social equality	300	75	20	26.7	40	53.3	24	32.0	52	69.3	136	45.3
	2400	600	191	31.8	313	52.2	216	36.0	329	54.8	1049	43.7
Sustainable development society principles												
• Respect and care for community of life	300	75	10	13.3	10	13.3	27	36.0	38	50.7	85	28.3
• Improve quality of human life	840	210	68	32.4	141	67.1	135	64.3	109	51.9	453	53.9
• Conserve earth's vitality and diversity	900	225	42	18.7	59	26.2	59	26.2	89	39.6	249	27.7
• Minimise depletion of non-renewable resources	180	45	3	6.7	3	6.7	3	6.7	3	6.7	12	6.7
• Keep development in Earth's carrying capacity	120	30	11	36.7	8	26.7	0	0.0	11	36.7	30	25.0
• Change personal attitudes and practices	360	90	40	44.4	13	14.4	70	77.8	82	91.1	205	56.9
• Framework for integrating development and environment	600	150	38	25.3	107	71.3	61	40.7	63	42.0	269	44.8
	3300	825	212	25.7	341	41.3	355	43.0	395	47.9	1303	39.5
Strategic imperatives for sustainable development												
• Revive growth	480	120	76	63.3	73	60.8	82	68.3	108	90.0	339	70.6
• Change quality of growth	540	135	25	18.5	97	71.9	34	25.2	44	32.6	200	37.0
• Conserve and enhance the resource base	420	105	3	2.9	25	23.8	2	1.9	25	23.8	55	13.1
• Ensuring a sustainable level of population	116	29	0	0.0	0	0.0	0	0.0	8	27.6	8	6.9
• Integrate environment in economics in decision-making	228	57	0	0.0	24	42.1	12	21.1	16	28.1	52	22.8
	1784	446	104	23.3	219	49.1	130	29.1	201	45.1	654	36.7
OVERALL PERFORMANCE	7484	1871	507	27.1	873	46.7	701	37.5	925	49.4	3006	40.2

The scores are calculated by applying respective weights to each cell [in Table 8.8] which indicates an occurence of consideration of land use planning criteria for sustainable development, and then total them up by each sustainable development issue. The performance of each plan is indicated by the % of scores out of the total possible maximum score if all criteria are considered by at least one policy, proposal, strategy and objective.

The respective weights are in order of emphasis given to strategies, objectives, policies, proposals in planning with SEA:

Policies = 8; Proposals = 4; Strategies = 2; Objectives = 1; Max Score per plan = Total score if all criteria in Table 8.8 are considered by at least one policy, proposal, strategy and objective; Max Score for four plans = Max Score per plan multiplied by 4.

TABLE 8.12: LEVELS OF PERFORMANCE IN THE CONSIDERATION OF SUSTAINABLE DEVELOPMENT IN FOUR MALAYSIAN STRUCTURE PLANS -METHOD 2

Sustainable development criteria	PERFORMANCE LEVELS IN %														
	OPTION A: Equal priorities					OPTION B: Policies are main priority					OPTION C: Strategies are main priority				
	A	**B**	**C**	**D**	**Av.**	**A**	**B**	**C**	**D**	**Av.**	**A**	**B**	**C**	**D**	**Av.**
SUST. DEVT. GOALS	47.5	60 6	53 8	65 6	56.9	66.7	73.7	61.5	65.0	66.7	31.8	52.2	36.0	54.8	43.7
resource conservation	35.0	45.0	15.0	45.0	35.0	38.7	46.7	8 0	53.3	36.7	34.7	46.7	12.0	33.3	31.7
natural & built environment	56.7	75 0	63.3	68.3	65.8	80.0	87.1	73.3	53.3	73.4	40.0	68.4	40.0	52.9	50.3
environmental quality	43.3	51.7	56.7	66.7	54.6	62.7	69.3	65.3	76.4	68 4	24.4	37.3	41.3	59.1	40.6
social equality	45.0	60.0	55 0	75.0	58.8	66.7	73.3	68 0	77.3	71.3	26.7	53.3	32.0	69.3	45.3
SUSTAINABLE DEVT. SOCIETY	42.4	47.3	52.3	60.9	50.5	57.3	56.2	57.5	71.5	60 6	25.7	41.3	43.0	47.9	39.5
community life	35.0	35 0	45.0	60.0	43.8	53.3	53.3	44.0	62.7	53.3	13.3	13.3	36.0	50.7	28.3
quality of life	46.4	71.4	62.5	67.9	62.1	58.1	75.7	71.4	79.0	71.1	32.4	67.1	64.3	51.9	53.9
earth's vitality and diversity	36.7	26.7	41.7	55.0	40.0	54.7	31.6	44.4	71.5	50 6	18.7	26.2	26.2	39.6	27.7
min. depletion of resources	16 7	16.7	16.7	16.7	16.7	26.7	26.7	26.7	26.7	26 7	6.7	6.7	6.7	6.7	6.7
devt within carrying capacity	37.5	12.5	0.0	37.5	21.9	46 7	6.7	0 0	46.7	25.0	36.7	26.7	0.0	36.7	25.0
personal attitude & practices	58.3	37.5	87.5	95.8	69.8	77.8	57.8	94.4	97.8	81.9	44.4	14.4	77.8	91.1	56.9
integrated devt. & env.	42.5	72.5	57.5	57.5	57.5	61.3	85.3	62.7	68.0	69.3	25.3	71.3	40.7	42.0	44.8
STRATEGIC IMPERATIVES	34.5	44.8	37.1	56.0	43.1	46.2	45.1	35.9	61.4	47.1	23.3	49.1	29.1	45.1	36.7
revive growth	71.9	50.0	71.9	90.6	71.1	90.8	43.3	73.3	97.5	76.3	63.3	60.8	68.3	90.0	70.6
change quality of growth	41.7	69.4	41.7	47.2	50.0	63.0	76.3	45.2	52.6	59.3	18.5	71.9	25.2	32.6	37.0
enhance resource base	8.3	33.3	8.3	54.2	26.0	11.4	38.1	7.6	61.9	29.8	2.9	23.8	1.9	23.8	13.1
sustainable level of pop.	0.0	0.0	0.0	12.5	3.1	0.0	0.0	0.0	6.9	1.7	0.0	0.0	0.0	27.6	6.9
env. & econs. in decisions	0.0	18.8	18.8	31.3	17.2	0.0	10.5	5.3	33.3	12.3	0.0	42.1	21.1	28.1	22.8
PERFORMANCE	41.7	51.0	49.2	61.3	50.8	57.7	59.2	53.6	67.0	59.4	27.1	46.7	37.5	49.4	40.2

Notes:
A = Muar Selatan Structure Plan 1991-2010
B = Petaling and Klang [part] Districts Structure Plan 1991-2010
C = Melaka Historical City Structure Plan 1991-2010
D = Langkawi Island Structure Plan 1990-2005
Av. = Average

WEIGHTS IN DESCENDING ORDER OF PRIORITIES OF INSTRUMENTS:
OPTION A: equal priorities
OPTION B: Policies - 8; Proposals - 4; Strategies - 2: Objectives - 1.
OPTION C: Strategies - 8; Objectives - 4; Policies - 2; Proposals - 1.

TABLE 8.13: SUMMARY OF PERFORMANCE OF FOUR MALAYSIAN STRUCTURE PLANS IN THE CONSIDERATION OF CRITERIA FOR SUSTAINABLE DEVELOPMENT

METHOD 1		METHOD 2					
		OPTION A [Equal priorities]		OPTION B [Policies are main priorities]		OPTION C [Strategies are main priorities]	
Rank order of Plans	Performance in %	Rank order of Plans	Performance in %	Rank order of Plans	Performance in %	Rank order of Plans	Performance in %
1 - D	50.4	1 - D	61.3	1 - D	67.0	1 - D	49.4
1 - A	50.4	2 - B	51.0	2 - B	59.2	2 - B	46.7
2 - B	49.6	3 - C	49.2	3 - A	57.7	3 - C	37.5
2 - C	49.6	4 - A	41.7	4 - C	53.6	4 - A	27.1
Average Performance 50.0 %		Average Performance 50.8 %		Average Performance 59.4 %		Average Performance 40.2 %	

Note:

A = Muar Selatan Structure Plan 1991-2010
B = Petaling and Klang [part] Districts Structure Plan 1991-2010
C = Melaka Historical City Structure Plan 1991-2010
D = Langkawi Island Structure Plan 1990-2005

In Method 1, where the assessment is based on general consideration of criteria, there is an insignificant difference between individual plan performance levels, which are only between 49.6% - 50.4%. The average performance level from Option A is nearly equal to that of Method 1, thus indicating that generally policies, proposals, strategies and objectives which assume equal values do not affect the average performance. However they affect the individual plan performance, which range between 41.7% - 61.3%.

The big differences in the average performance levels from Options A, B and C indicate that the significance and effectiveness of plans are determined by the different emphasis [in the form of different weights in this exercise] given to policies, proposals, strategies and objectives. Option B reflects the current structure plan approach in Malaysia, where policies, proposals, strategies and objectives are given priorities in that order. Option C is an option that is desirable in planning for sustainable development, particularly with the use of SEA, in which strategies are given the highest priority, followed by objectives, policies and proposals. When assigned the new priority values [weights] in Option C, the average performance level drops from 59.4% in Option B [Policies are priorities] to 40.2%.

Table 8.13 also shows a significant pattern in the rank order of plans under the four options. The Langkawi Plan has the highest score in all options. This is consistent with the relatively more conscious emphasis given to environmental considerations in the plan, as a result of its status as a tourist resort which is noted for its natural environment. Compared to the other plans, the Langkawi Plan is also more specific in its statements of strategies and

policies. Muar on the other hand, although having the same rank as Langkawi in Method 1, scores below average in the other options. This is partly due to its more general statements of strategies and policies [the strategies are in fact in a state-wide context]. Petaling scores reasonably well because of its conscious attempt towards an optimum pattern of land uses within the most densely developed corridor in the country.

This is a relatively simple analytical exercise, and the weights used are arbitrarily assigned. Different sets of weights will produce different averages and individual performance levels. However the exercise produced significant results to show that there is a need for more emphasis on strategies and objectives in planning for sustainable development in Malaysian structure plans. This is consistent with the main task in SEA, which is the assessment and evaluation of impacts of alternative strategies in policies, plans and programmes. The methods used in this exercise can also be further developed as part of a comprehensive analysis of a plan or a comparative evaluation method of several structure plans or other plans.

8.5 POTENTIAL FOR SEA

8.5.1 Introduction

This section describes the role of land use planning in Malaysian national integrated planning, and the proposal for SEA in land use planning from the views of land use planning and environmental experts in the Malaysian planning scene.

The following sections summarise opinions which were obtained from interviews conducted for this research between August-October 1992 in Malaysia. The rationale and approach for the interviews, as well as the list of interviewees, are described in Chapter 1. The opinions are not representative of the opinions of the whole population of land use planners and environmental experts but nevertheless give an indication of the issues that prevail in the land use planning scene in Malaysia, as well as planning, legal and administrative issues that need to be addressed before making any changes to the Malaysian land use planning system.

8.5.2 National integrated planning

On the subject of a national integrated planning system for Malaysia, in which land use planning and SEA are integrated with socio-economic planning at all levels of government and administration, the opinions are grouped into four issues: the general concept of National Integrated Planning System; benefits for project EIA; hierarchy and types of plans; and appropriate form of EIA for each type of plan in the planning hierarchy. For each issue, the

TABLE 8.14: SUMMARY OF OPINIONS ON A NATIONAL INTEGRATED PLANNING SYSTEM FOR MALAYSIA

Issues	Positive comments	Negative/Cautionary comments
• The general concept of National Integrated Planning System.	- Eliminate misinterpretation of spatial/land use policies from national economic plan. - Provide framework for regional and structure/ local plans and development projects. - Prevents duplication of planning activities. - Sensible way of practising strategic planning.	- There is already a system of hierarchy in the national planning system, starting from the national five-year plans to local land use plans. Introducing more plans would make the system more complicated and duplicating. - It is impossible to have a national land use plan since land is a state matter. Coordination and agreement for such a plan is very difficult. - Must study implications on the political-administrative organization and enabling machinery particularly the proposed National Physical Planning Council. - Need for stronger interaction and integration between all agencies, both horizontally and vertically. - Important to study TCPD's current role in national development planning.
• Benefits for project EIA.	- Reduce identification of projects for EIA. - Reduces differences of opinions between local planning authorities and DOE on development projects. - Reduces the basic data collection at project level.	
• Hierarchy and types of plans.	- With integration of socio-economic and land use/spatial plans, the determination of responsible and approving authorities of various plans is important.	- Essential to study manpower requirements in terms of numbers and qualifications. - Important that the present planning process is not unduly lengthened. - Implications on Town and Country Planning Act and other Legislations.
• Appropriate form of EIA for each type in hierarchy of plans.	- Desirable to ensure elimination of duplication of data collection and analysis at each level, down to project EIA.	- EIA at the plans level should in no way compromise the need for vigour at project EIA. - Important to study the legal implications.

Note: Opinions given at interviews with Malaysian land use planners and environmental officers from public and private sectors, August - September 1992.

opinions are again grouped into two i.e. positive opinions/comments and negative or cautionary opinions/comments [see Table 8.14].

Generally there is no rejection of the proposal for a national integrated planning system. It is acknowledged to be able to eliminate misinterpretation of spatial/land use policies from national economic plan at the structure plan level, and reduce the identification of projects for SEA is integrated within the planning system. However it is important that the determination of responsible and approving authorities of various plans are made, in order to avoid complication and duplication. On the negative side, there is a fear that a national integrated system of planning might make structure plan-making more complicated, need more manpower and unduly lengthen the present planning process. The implications on the State Authority's responsibility on land and planning matters and on Act 172 also need to be studied, and it is cautioned that SEA in plans should in no way compromise the need for rigour in project EIA. In summary the opinions provide a positive guidance for the development of the proposal in Part 3.

On the roles and responsibilities for SEA in the national integrated planning system, the positive and negative comments/opinions are grouped into five issues [see Table 8.15]. The first issue is the capability of TCPD to be the responsible agency for SEA for land use plans. The general opinion is that TCPD is capable to be the responsible agency, but this must be preceded with manpower planning and training. There is a need for a stronger interaction between TCPD and DOE, and a clear distinction of the responsibilities of the two agencies in the planning system. However it is cautioned that at current status of manpower in TCPD, it might not be able to cope with additional functions and responsibilities.

On the second issue, i.e. the capability of TCPD to provide physical planning inputs in macro- and micro-socioeconomic plans, and the third issue, i.e. the capability of TCPD in managing SEA , the general opinion is that TCPD is capable, provided that additional manpower for multi-disciplinary planning teams are available. There is a need for closer interactions with other agencies, universities and private consultants, and a comprehensive data bank in the department. The opinions on the fourth issue i.e. the capability of current structure plan project managers to manage SEA, and on the fifth issue i.e. measures to cope with additional roles and responsibilities in TCPD, the general opinion is that there is a need for increased manpower and training, and more interaction and exchange of knowledge between government planners and experts from other departments, universities and the private sector. The general caution on these issues is the unlikely event that additional manpower will be made available to TCPD, in view of the government's programme of trimming down the Civil Service. There is a need for a strategy and measures to overcome this hurdle.

TABLE 8.15: SUMMARY OF OPINIONS ON THE ROLES AND RESPONSIBILITIES FOR SEA IN THE NATIONAL INTEGRATED PLANNING SYSTEM FOR MALAYSIA

Issues	Positive comments	Negative/Cautionary comments
• Capability of TCPD to be the responsible agency for SEA for land use plans.	- Can perform this function with additional manpower and training in the appropriate disciplines. - Need for careful manpower planning and training. - Need for strong DOE involvement, as it is the national designated environmental authority. Need for close coordination between TCPD and DOE. - Need for clear distinctions between TCPD and DOE for all types of plans and EIA types.	- At current status, will not perform well, as the required manpower and expertise is not available.
• Capability of TCPD to provide physical planning inputs in macro- and micro-socio-economic plans.	- Can perform this function as it is currently doing. - Structure plan is more than a physical plan, so the proposal is an extension of current practices.	
• Capability of TCPD in managing SEA in structure and local plans and other land use plans.	- Can perform this function with additional manpower and training in the right disciplines. - Manpower for a multi-disciplinary team can be available from other agencies, universities and private consultants. - Need for a Data Bank for environmental data in TCPD, and this needs to be regularly updated.	- At current status, will not perform well, as the required expertise is not available.
• Capability of current structure/local plans project-managers to manage SEA.	- Can perform with some exposure and training to relevant requirements. - Need for special training for project managers in managing SEA.	
• Measures to cope with additional roles and responsibilities in TCPD.	- Increased staff and training. - Need for more interaction between government planners and other experts from other departments, universities and the private sector. - Training the public for effective public participation in all levels of planning.	- It is unlikely that additional manpower will be available as the Federal Government is actively trimming down the Civil Service.

Note: Opinions given at interviews with Malaysian land use planners and environmental officers from public and private sectors, August - September 1992.

On the whole the opinions throw a positive light on the proposal towards a national integrated planning system for Malaysia. However it is acknowledged that there would be problems in the legislative and administrative frameworks, as well as crucial need for education and training on SEA for land use planners and other experts from the public and private sectors, as well as for the public, if there is going to be effective public participation.

8.5.3 SEA in land use planning

Table 8.16 summarises opinions which are grouped into four issues. In general there is an agreement to integrate SEA into land use planning, but there is a need for a pilot project to test its function and viability. However there is a fear that this procedure in planning will further delay and lengthen plan-making and increase plan-making costs. There is an important opinion that SEA for Malaysia must perform the following functions in order of priority: [1] management of environmental change; [2] assist to achieve sustainable development; [3] assist in decision-making; and [4] overcome shortcomings of project EIA. Nevertheless there is still a caution in introducing SEA into land use planning because of political and bureaucratic sensitivities, for example questions like: will SEA be under TCPD's or DOE's jurisdiction?; Will SEA require DOE's approval, in view of the fact that DOE is the environmental authority for Malaysia?; Is TCPD capable of being SEA's responsible authority? All these issues and questions need to be addressed before the proposals could be put to test.

On the process, method and implementation, comprehensive comments and suggestions have been made, and are summarised in Table 8.17. There is a consensus of opinion that for SEA to be included in land use planning, there is a need for expertise in managing multi-disciplinary teams of experts in land use planning studies. A pilot project is necessary in order to produce cost-effective process and method. In particular, priority issues are additional staffing for TCPD; establishment of the National Physical Planning Council; establishment of a Data Bank on environmental data in TCPD; a review of the functions of participating agencies in the proposed national integrated planning system; and a review on the implications of the proposal on Act 172.

8.6 CONCLUSIONS

This chapter has established the Malaysian land use planning framework for the integration of SEA within a national integrated planning system. The examination of the Malaysian planning act has identified its significant contribution to Malaysian land use planning through the structure plan system and formal public participation procedures in plan-making. Act 172 has also provided for definite roles and responsibilities for federal, state and local authorities in planning matters, plan-making and decision-making. However the examination has also

TABLE 8.16: SUMMARY OF OPINIONS ON THE INTEGRATION OF SEA INTO MALAYSIAN LAND USE PLANNING

Issues	Positive comments	Negative/Cautionary comments
• The general SEA concept in Malaysian land use planning.	- Should be part of land use planning, provided that related resources are provided. - Useful for land use planning because it provides a formal procedure and method for assessing environmental impacts of land use plans' policies and proposals. - Provides the alternative to plan evaluation methods which are usually not performed in land use planning activities. - Ensures that policy and strategic matters are resolved earlier, before project EIA. - Reduce the number of project EIA. - More resources and emphasis would be put to data collection. This assist in project EIA. - Need for a pilot project to test its viability. - The right name for the concept is very important, in order to avoid confusion with project-EIA.	- Land use plans, already include environmental considerations. - Structure and local plans plan for quality of life. - Duplicates what is currently practised under the Planning Act. - Delays completion and lengthen plan-making. - Increases plan-making costs. - Implementation problems, such as in manpower and financial availability and administrative and legislative frameworks.
• Integrated SEA vs. EIA of land use plan	- Integrated EIA is better than EIA of plan.	- Irrelevant, since there is no need for SEA.
• The proposed functions of SEA: [a] management of environmental change [b] assist to achieve sustainable development [c] assist in decision-making [d] overcome shortcomings of SEA	- Priority for Malaysia is economic development, - [a] is important because of rapid development, - [b] is important because of limited resources. - [c] is important to overcome environmental deterioration. - [d] is important for informed decisions.	- Land use planning is capable of achieving the four objectives, provided that the plans are properly and rationally prepared. - By including environmental consideration, land use plans already perform the four functions. - [d] should not be a function of SEA since it is a rationale for having SEA.
• Politics and bureaucracy		- There must be caution in introducing SEA into land use planning, because of political and bureaucratic sensitivities, e g.. = SEA will be under TCPD/DOE's jurisdiction? = SEA to get DOE's approval? = Is TCPD capable to be SEA's approving authority?

Note: Opinions given at interviews with Malaysian land use planners and environmental officers from public and private sectors, August - September 1992.

TABLE 8.17: SUMMARY OF COMMENTS AND SUGGESTIONS FOR THE PROCESS, METHOD AND IMPLEMENTATION OF SEA IN LAND USE PLANNING FOR MALAYSIA

Issue	Comments / Suggestions
• Process & Method	- With multi-disciplinary experts simultaneously undertaking planning and EIA, the planning team would be big and its management more complex. This requires expertise in project management. - Data collection is the most rigourous activity. To meet schedules, data availability and accessibility is crucial. A relevant suggestion for a Data Bank on environmental data to be established at TCPD. This is a permanent data bank for the whole country. - A pilot project which involves a multi-disciplinary team consisting of experts from the public and private sectors and academicians should prepare the ground for a good implementation of the process and method in SEA. - A pilot project for each type of plan in the planning hierarchy is suggested. - The right presentation of findings is very important, so as to meet the requirements of all actors in the planning and decision-making process. - The critical factor is the increased cost and longer time it takes to prepare a plan with SEA. The need for cost-effective process and method is crucial. More coordination between all agencies.
• Implementation	- In general, the priority issues are: Training/Expertise: technical and non-technical training; Educating the decision-makers in the objectives and processes of SEA; Developing relationships between environmental sectors and sectoral development agencies; Facilitating public participation and improve access to information; Enhancing the role of non-governmental organizations [NGOs]; Establishing the policy framework for SEA.at all levels of government; Improving legislations, administration and enforcement; Learning from problems in project EIA which can be a lesson to SEA; Establishing guidelines for screening and scoping; Establishing guidelines for predictions and evaluation; Sharing environmental assessment experiences [project experiences and data banks]; and Some special issues such as research, reviewing EIA, having local expertise, and looking for cost-effective process and method in SEA. - In particular, the priority issues are: Additional staffing for TCPD; Establishment of the National Physical Planning Council; Establishing new organisational structure and working relationships between government departments; Finance for research and pilot projects; Establishment of a Data Bank on environmental data at TCPD; Study the implications on the Town & Country Planning Act; and Review the functions of participating agencies in the proposed national integrated planning system.

Note: Opinions given at interviews with Malaysian land use planners and environmental officers from public and private sectors, August - October 1992.

identified the ineffective performance of local authorities in plan-making, and the strong federal influence in plan-making through Federal TCPD and strong state influence in decision-making through State TCPD.

The examination of Malaysian plans has established that, like its English counterpart, the Malaysian structure plan is more than merely a physical plan, because it also considers social and economic developments which affect land uses and the environment. However the problem that is created by the local authority system under the Local Government Act still needs to be resolved. As far as planning is concerned, TCPD has made a headstart by proposing an amendment to Act 172 to include the provision for 'joint' structure plans. These are examined further in Chapter 12.

The examination of the public participation performance in ten structure plan studies reveals that the level of public participation in Malaysia is still low, even though Act 172 has been in force since 1976. The level of performance of Malaysian structure plans in terms of their consideration of land use planning criteria for sustainable development is found to be low. This conclusion is derived from the evaluation of four structure plans, as described in section 8.4.

From the opinions of some Malaysian land use planning and environmental experts, it seems that the Malaysian land use planning scene is ready to accept the integration of SEA into land use planning, within a national integrated planning system. There is no rejection on the idea for a national integrated planning system, although rightly there are cautionary remarks on the likely problems in the legislative and administrative frameworks as well as a need for education and training on this aspect. On SEA in land use planning, there is a majority agreement on this, although there are cautions of political and bureaucratic sensitivities between the TCPD and the DOE and possibly other departments/agencies. Priority areas that need to be looked into include the need for additional manpower in TCPD and other related agencies; the need to hasten the formulation of the National Physical Planning Council; establishment of a Data Bank in TCPD; and a review of Act 172. These are some of the issues that need to be addressed in the proposal for SEA in Malaysian land use planning in Part 3.

Chapter 9

Malaysian EIA system

9.1 INTRODUCTION

Malaysia had proceeded very cautiously with the implementation of Environmental Impact Assessment [EIA], and many lessons can be learnt from this experience. This chapter therefore examines Malaysian EIA system to identify issues which could assist in the integration of SEA in land use planning.

The following sections trace the development of EIA in Malaysia, and examine its legislative and institutional framework, including the part played by the public in the system. The examination of the time and cost it takes to prepare EIA reports could assist in the analysis for the SEA proposal, while lessons from the problems it faces in terms of delays in project planning and implementation can assist in outlining the proposal for SEA in Part 3.

The survey of government departments with environment-related activities in Malaysia, which is described in Chapter 1, gives an indication of the existing situation with regards to awareness, attitudes and capacity of various departments in environmental management, and the potential for introducing SEA into the planning process.

9.2 DEVELOPMENT OF EIA IN MALAYSIA

9.2.1 Introduction

This section traces the development of EIA in Malaysia, from its experimental days to its legislation. The policy objectives and strategies underlying the concern for the environment are examined in section 9.2.2, and the EIA concept as implemented in Malaysia is examined in section 9.2.3. All these explain the philosophy of EIA in environmental management in Malaysia.

9.2.2 Policies and principles

Malaysia's active environmental movement of the 1970s was officially rewarded when EIA was formally recognized as a tool for more effective environmental protection in the Third Malaysia

Plan 1976-1980, which required environmental assessment of major development projects. Of particular importance is the mention for the need for a National Environmental Policy and EIA [DoE Malaysia 1987].

The approach to EIA's implementation was a cautious one. Several approaches were experimented, using several projects as experimental projects for EIA. The most active experimental phase was from 1981-1985 [Omar 1990, Ho 1990, Ebisemiju 1991]. Efforts to formalise EIA were made in 1977 when EIA was introduced at the National Seminar on EIA in September of that year. The proposed procedure which was submitted to the government in 1978 was approved in principle, subject to the preparation of a set of guidelines for the preparation of EIA. The guidelines, in the form of *A Handbook of Environmental Impact Assessment Guidelines* [DoE Malaysia 1987] were subsequently approved by the Environmental Quality Council in 1979, after which EIA was enforced institutionally. This introduction of EIA through institutional procedures and not through legislative measures makes Malaysia unique from most other developing countries which introduced EIA through legislative measures [Ebisemiju 1991]. However this proved to be a difficult task [Ho 1990]. It was soon realized that EIA's implementation needed statutory backing.

In 1985, the Environmental Quality [Amendment] Act 1985, which is an amendment of the Environmental Quality Act 1974, made EIA mandatory for prescribed activities. These activities are contained in the Environmental Quality [Prescribed Activities] [Environmental Impact Assessment] Order 1987, which was gazetted and came into force on the first of April 1988.

Seven environmental policy objectives which were spelt out in Chapter IX of the TMP 1976-1980 set the basis for EIA operation in Malaysia. These were reordered and reiterated in the FMP 1986-1990 and SMP 1991-1995. The seven policy objectives are as follows:

[i] "...to maintain a clean healthy environment...";
[ii] "...to maintain the quality of the environment relative to the needs of the growing population...";
[iii] to minimise...the impact of the growing population and human activities relating to mineral exploration, deforestation, agriculture, urbanisation, tourism, and the development of other resources on the environment.";
[iv] to balance "[the] goals for socio-economic development and the need to bring the benefits of development to a wide spectrum of the population...against [the] maintenance of sound environment conditions...";
[v] "...to place more emphasis on prevention through conservation rather than on curative measures...*inter alia* by preserving the country's unique and diverse cultural and natural heritage";
[vi] "...to incorporate an environmental dimension in project planning and implementation...*inter alia* by determining...the implications of the proposed projects...and the costs of the required environmental mitigation measures through the conduct of EIA"; and

[vii] to promote "[greater] cooperation and increased coordination among relevant federal and state authorities..." as well as "...[among] the ASEAN Governments...". [DOE 1987 pp.1-2].

Although they were formulated in the 1970s the above policy objectives reflect the principles put forward by the World Conservation Strategy of 1980 and the sustainable development concept of *Our Common Future* . Objective [iv] in particular demands for a balance between needs and equity, and between development and environment. Objective [v] gives the emphasis on prevention rather than curative measures for achieving environmental quality and quality of life, a concept that was popularised by *Our Common Future*. However objective [vi] only stresses on the incorporation of environmental dimension in project planning and implementation, while policies, plans and programmes [PPPs] are not required to have any form of environmental assessment. The shortcoming to PPPs were remedied in the SMP 1991-1995 by including, as its one of four environmental strategies for the environment, the strategy for integration of environmental dimension in policy and development planning [see Chapter 7]. As noted, one of the other strategies is EIA in project planning.

The SMP 1991-1995 provides more precise directions for environmental management, in the form of major environmental issues and concerns which require effective management. These indirectly also become the terms of reference for EIA and other strategies for environmental management. The environmental issues and concerns which are listed in the SMP are as follows:

- the increasing air and noise pollution in the urban areas as a result of the expansion of automobile ownership and vehicular traffic, with increasing affluence of Malaysians;
- the constraints on the supply of affordable housing and efficient sewerage and sanitation facilities in major towns;
- the lack of adequate and efficient on-site and off-site waste disposal facilities;
- pollution caused by unorganized disposal of consumer projects;
- the encroachment of economic activities on vegetation, forest cover and catchment areas which have serious repercussions on sustained water supply; and
- soil-related pollution caused by unplanned construction activities.
[SMP 1991-1995, p.397].

It is clear that solutions to the above issues need more than EIA, for as acknowledged in Chapter 4, EIA is only reactive, while these issues need measures which are curative as well as preventive. An appropriate approach is SEA because it is more comprehensive, far-sighted, and value-based.

9.2.3 Concept

Different from the original EIA concept of NEPA 1969 of the USA, EIA in Malaysia is meant only for projects. The EIA procedure "...was developed primarily as an aid to the environmental planning of new development projects or the expansion of existing development

projects...Provisions has not been made for the planning of more generalised development concepts and strategies." [DOE Malaysia 1987, p.1]. The EIA activities have been designed with the objectives:

1. To examine and select the best from the project options available;
2. To identify and incorporate into the project plan appropriate abatement and mitigating measures;
3. To predict significant residual environmental impact;
4. To determine the significant residual environmental impacts predicted; and
5. To identify the environmental costs and benefits of the project to the community.

[DOE Malaysia 1990, p.3].

The EIA Handbook [DOE Malaysia 1987] includes some definitions which explain the Malaysian EIA concept which answers to the above objectives.:

> EIA: "...a *process* designed to identify and predict the impact on man's health and well-being *of development projects*, and to interpret and communicate information about the impacts."
>
> ENVIRONMENTAL EFFECT: "...a process [such as erosion of soil, the accumulation of pollutants or the displacement of people] that is *modified by man's action.*"
>
> ENVIRONMENTAL IMPACT: "The *net change [good or bad]* in man's health or well-being, including the ecosystems on which man's well-being depends, that results from an environmental impact. Environmental impact should take into account the change in environmental quality that would have occurred naturally, *without Man's Action.*"
>
> RESIDUAL ENVIRONMENTAL IMPACT: "...The potential impact remaining after mitigating measures have been adopted into a project plan."
>
> INTEGRATED PROJECT PLANNING: "...a process in which through the various procedures available, all *technical, economic and environmental factors in project planning are assessed and evaluated together* and throughout the course of project development." [Italics are for emphasis]

The terms define a Malaysian EIA concept which basically adopts the general perceptions of many EIA experts and authors [examined in Chapter 4] - EIA is a process; it is meant for development projects; it looks for net change [good or bad] or residual environmental impact; it asks for mitigating measures; and it includes the assessment of the no-action option. The most pertinent concept however, is that Malaysian EIA is meant for integrated project planning which is defined above.

Table 9.1 outlines the checklist of environmental components for Malaysian EIA [DoE Malaysia 1987]. Basically there are three major components: Physico-Chemical, Biological and Human, which are sub-divided into Land, Surface Water, Groundwater, Atmosphere, and Noise under Physico-Chemical; Species and Populations under Biological; and Health and Safety, Social and Economic and Aesthetic and Cultural under Human. This system of environmental components seems to be a combination of Lee's type of environmental impacts according to types of environment [1989] [see Table 4.1], Jain et.al.'s environmental

attributes [1981] [see Table 4.2] and Munn's impact categories in terms of areas of human concerns [1975] [see Table 4.3].

TABLE 9.1: CHECKLIST OF ENVIRONMENTAL COMPONENTS FOR MALAYSIAN EIA

A PHYSICO-CHEMICAL

1. LAND
   - [i] Landforms
   - [ii] Soil Profile
   - [iii] Soil Composition
   - [iv] Slope Composition
   - [v] Subsidence and Compaction
   - [vi] Seismicity
   - [vii] Flood Plains/Swamps
   - [ix] Engineering & Mineral Resources

2. SURFACE WATER
   - [i] Shoreline
   - [ii] Bottom Interface
   - [iii] Flow Variation
   - [iv] Water Quality
   - [v] Drainage Pattern
   - [vi] Water Balance
   - [vii] Flooding
   - [viii] Existing Use

3.GROUNDWATER
   - [i] Water Table
   - [ii] Flow Regime
   - [iii] Water Quality
   - [iv] Recharge
   - [v] Aquifer Characteristics
   - [vi] Existing Use

4. ATMOSPHERE
   - [i] Air Quality
   - [ii] Air Flow
   - [iii] Climatic Changes
   - [iv] Visibility

5. NOISE
   - [i] Intensity
   - [ii] Duration
   - [iii] Frequency

B BIOLOGICAL

1. SPECIES AND POPULATIONS
   - [i] Terrestrial Vegetation
   - [ii] Terrestrial Wildlife
   - [iii] Other Terrestrial Fauna
   - [iv] Aquatic/Marine Flora
   - [v] Fish
   - [vi] Other Aquatic/Marine Fauna

2. HABITATS
   - [i] Terrestrial Habitats
   - [ii] Terrestrial Communities
   - [iii] Aquatic Habitats
   - [iv] Aquatic Communities
   - [v] Estuarine Habitats
   - [vi] Estuarine Communities
   - [vii] Marine Habitats
   - [viii] Marine Communities

C HUMAN

1. HEALTH AND SAFETY
   - [i] Physical Safety
   - [ii] Psychological Well-Being
   - [iii] Parasitic Disease
   - [iv] Communicable Disease
   - [v] Physiological Disease
   - [vi] Disease Vectors

2. SOCIAL AND ECONOMIC
   - [i] Employment
   - [ii] Housing
   - [iii] Education
   - [iv] Utilities
   - [v] Amenities

3. AESTHETIC AND CULTURAL
   - [i] Landforms
   - [ii] Biota
   - [iii] Wilderness
   - [iv] Water Quality
   - [v] Atmospheric Quality
   - [vi] Climate
   - [vii] Tranquility
   - [viii] Sense of Community
   - [ix] Community Structures
   - [x] Man-made objects
   - [xi] Historic Places of Structures
   - [xii] Religious Places or Structures
   - [xiii] Landscape
   - [xiv] Compositions

Source: DeE Malaysia 1987.

9.3 LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

9.3.1 Introduction

Malaysia tried to enforce EIA through institutional measures, but found it very difficult and hence was forced to enforce it through legislative measures. However, as in any system, its

effectiveness depends on the interrelationship and interdependence between legislation and institutions. This section examines the legislative and institutional framework of Malaysian EIA, to see how the two support each other in the implementation of EIA in Malaysia.

9.3.2 Legislative framework

In line with the policy that EIA is meant for large projects, EIA is required of all projects which are included as a prescribed activity, as provided for under Section 34A (1) of the Amendment Act 1985. Nineteen categories of prescribed activities are listed in the Environmental Quality [Prescribed Activities] [Environmental Impact Assessment] Order 1987. The nineteen categories of activities cover the following:

Agriculture e.g. land development schemes.
Airport - all airport developments.
Drainage and irrigation schemes .
Land reclamation or coastal areas.
Fisheries e.g. aquaculture projects.
Forestry e.g. conversion of forests .
Housing - large schemes.
Industry - large polluting industries.
Infrastructure e.g. highways and industries.
Ports - all port developments.
Mining - mining and ore processing.
Petroleum - oil and gas field development.
Power generation - thermal and hydro.
Quarries - including near housing.
Railways - development of new routes.
Transportation - mass rapid transport projects
Resort and recreational development.
Waste treatment and disposal projects.
Water supply - surface and groundwater.

Under Section 34A (2) of the Amendment Act, "Any person intending to carry out any of the prescribed activities shall, *before any approval for the carrying out of such activity is granted by the relevant approving authority, submit a report to the Director General.* The report shall be in accordance with the guidelines prescribed by the Director General and shall contain an *assessment of the impact* such activity will have or is likely to have on the environment and the *proposed measures* that shall be undertaken to prevent, reduce or control the adverse impact on the environment." [Italics are for emphasis]

The above provision reflects the complexity of the system. While the EIA report has to be approved by the Director General of the DoE, the approving authority of the proposed projects are other agencies. While the DoE approves the proposed measures that shall be taken to prevent, reduce or control the adverse impact on the environment, it is not the responsible authority for the implementation of the project. This arrangement has produced

problems in the implementation of EIA. However, as stated by the Director General of the DoE in an interview with this author, this problem is partly solved by the fact that DoE is also responsible for pollution control, and partly by the close cooperation between DoE and the implementing agencies.

Many of the nineteen categories of prescribed activities are defined in terms of its size [as area] or in terms of capacity. The thresholds for the prescribed activities are listed in Table 9.2. Although it is acknowledged that the prescribed activities include a wide range of activities, the list precludes the assessment of small projects which nevertheless may produce major environmental impacts, such as a 40 hectare housing development on a hilly area, a 5 hectare holiday resort on an environmentally sensitive location, or a 20 hectare conversion of mangrove swamps for industrial, housing or agricultural use. These 'unprescribed' activities, when grouped together, may produce accumulative impacts which may be greater than a few of the 'prescribed' activities put together. The major problem arising from this threshold system of prescribing EIA is when developers avoid EIA by proposing projects of sizes which are below the thresholds.

9.3.3 Institutional Framework

"Although within the Government, DoE is charged with the responsibility to monitor the state of the environment, all public agencies are equally responsible for environmental preservation and resource sustainability." [SMP 1991-1995, P. 397]. In line with this, although DoE is responsible for the approval of EIA reports, it is also the responsibility of other agencies to undertake measures that contribute towards environmental management. The responsibility for the enforcement of legal requirements for EIA is with the DoE but other government agencies are required to, and they do provide assistance to complement DoE's efforts. Project monitoring to ensure that recommendations related to proposed measures to be taken to prevent, reduce or control adverse environmental impacts is a task that is jointly shared between the DoE and other relevant project supervising agencies. Project proponents may also be required to undertake monitoring of their projects where this is found to be necessary.

The EIA procedure involves many individuals and organizations and the public, as summarised in Table 9.3. The involvement of many individuals and organisations in the EIA procedure means that there is a need for a strong cooperation between groups from various levels of government. Consultation is required by DoE [1987] in the EIA Handbook. This is because particular environmental aspects of a proposed project may be subject by law, or Government policy, to approval or consideration by another government agency or Statutory

Authority or Local Authority. Due to the lack of a centralised data bank on the environment, data and advice are directly obtained from the relevant agencies.

TABLE 9.2: THRESHOLDS OF PRESCRIBED ACTIVITIES WHICH ARE SUBJECT TO EIA IN MALAYSIA

Quantum	Unit	Activity	Schedule
60,000	Barrel	Construction of product depot for strorage of petrol or diesel	12 [e]
5,000	Hectare	Irrigation scheme	3 [c]
5,000	Tonne	Shipyard	8 [f]
4,500	Cu.meter	Ground water development for industrial, agricultural or urban water supply	19 [b]
500	Hectare	Land development scheme to bring forest land to agricultural production	1 [a]
500	Hectare	Development of agricultural estate involving changes in type of agricultural production	1 [c]
500	Hectare	Logging	6 [c]
400	Hectare	Construction of dams and hydroelectric power scheme reservoirs	13 [b] ii
250	Hectare	Mining of mineral in new areas	11 [a]
200	Hectare	Construction of dams and man-made lakes and artificial enlargement of lakes	3 [a]
200	Ton/day	Iron and steel industries using scrap iron	8 [e]
200	Hectare	Construction of dams and impounding reservoirs	19 [a]
100	Family	Agricultural programmes involving resettlement	1 [b]
100	Hectare	Drainage of wetland, wild life habitat or virgin forest	3 [b]
100	Ton/day	Chemical production industries	8 [a]
100	Ton/day	Lime production industries using rotary kiln	8 [d]
100	Ton/day	Iron and steel industries using iron ore	8 [e]
80	Room	Construction of coastal resort or hotels	17[a]
50	Hectare	Coastal reclamation	4
50	Hectare	Land base aquaculture projects in mangrove swamps forest	5 [c]
50	Hectare	Conversion of hilly forest land	6 [a]
50	Hectare	Conversion of mangrove swamps for industrial, housing or agricultural	6 [d]
50	Hectare	Housing development	7
50	Ton/day	Non ferrous industries other than aluminium and copper	8 [c]
50	Ton/day	Lime production industries using vertical kiln	8 [d]
50	Ton/day	Pulp and paper industries	8 [g]
50	Hectare	Industrial estate development for medium and heavy industries	9 [b]
50	Hectare	Sand dredging	11 [c]
50	Kilometre	Construction of off-shore and on-shore pipelines	12 [b]
40	Hectare	Construction of dams for hydroelectric power scheme 15 metres high	13 [b] i
30	Ton/hour	Cement industries	8 [d]
10	Megawatt	Construction of steam generated power stations using fossil fuel	13 [a]
2.5	Kilometre	Construction of airports	2 [a]

Source: Omar 1990.

TABLE 9.3: ROLES AND RESPONSIBILITIES IN MALAYSIAN EIA

Roles	Responsibilities
The Project Initiator	The individual or organisation from the public or private sector, or represented by a consultant, is responsible for the planning of the project and its EIA report, and the EIA cost. Even when the EIA report is done by another consultant or organisation, the project initiator is responsible for the EIA report.
The Assessor	This is the individual who conducts or coordinates the EIA, and is responsible to the project initiator.
The Environment-related Agencies and Specialists	These have a role to play in obtaining data, environmental effects and impacts. Specialists may be called upon to assist in the review of impact assessments of individual projects.
The public	Public participation is regarded as the most reliable way of predicting the impact of a project on people. A responsible, interested and participating public is important in environmental management.
A Review Panel	An independent body to review Detailed Assessment Reports, and to evaluate the environmental and development costs and benefits to the community. It formulates recommendations on which approving authorities make implementation decisions. The Secretariat to the Review Panel is responsible for providing guidelines to conduct EIA.
The Approving Authority	That Government Authority which decides, in view of environmental and development costs and benefits to the community, how [or whether] a project should proceed. Approving Authorities include:The National Development Planning Committee for Federal Government-sponsored projects; State Planning Authorities for State Government-sponsored projects; Ministry of Trade and Industry for industrial projects; and Local Authorities for local development projects.

Adapted from DoE Malaysia 1987.

9.3.4 EIA Procedure

The EIA procedure consists of three major steps which accommodate seven phases, as shown in Fig. 9.1. The steps and phases are:

1. Preliminary Assessment [Phases 1 and 2];
2. Detailed Assessment [Phases 4 and 5]; and
3. EIA Review [Phase 3 and 7 for Preliminary Assessment, and Phases 6 and 7 for Detailed Assessment

The objectives of a Preliminary Assessment for a prescribed activity are:

1. to examine and select from the project options available;
2. to identify and incorporate into the project plan appropriate abatement and mitigating measures,
3. to identify significant residual environmental impacts.

[DoE 1987, p.6].

FIG. 9.1: EIA PHASES AND PROCEDURE IN MALAYSIA

PHASE 1: *Project proponent carries out screening by checking the Schedule of Prescribed Activities.*

PHASE 2: *Project Proponent prepares Preliminary Assessment 'in-house' or hires a consultant.*

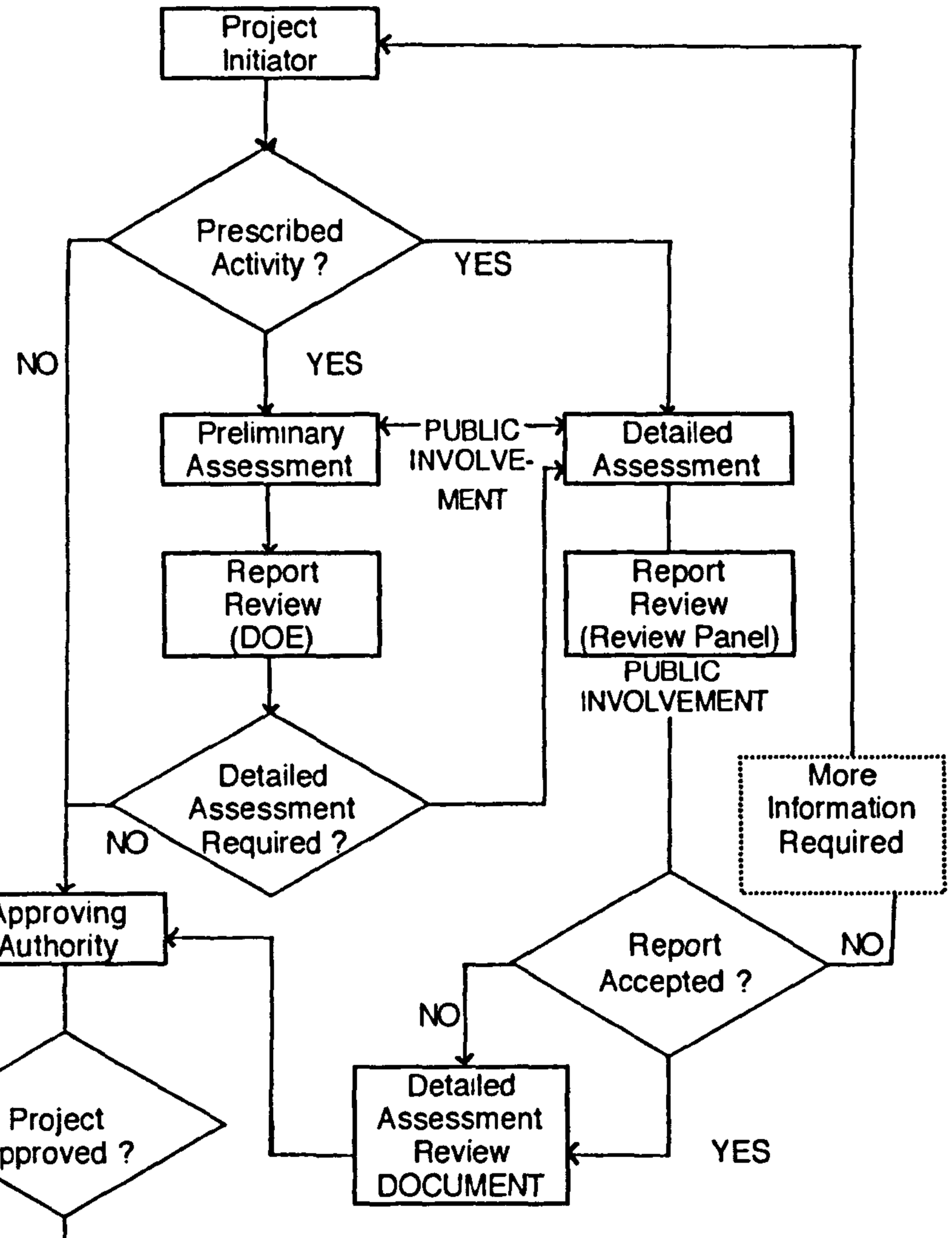
PHASE 3: *Preliminary Assessment is submitted to DOE for review. DOE decides if detailed assessment is required or not.*

PHASE 4: *Project proponent prepares the TOR for detailed assessment in consultation with DOE and concerned agencies.*

PHASE 5: *Detailed Assessment is prepared by Project Proponent.*

PHASE 6: *Detailed Assessment is reviewed by an independent and multi-disciplinary Review Panel.*

PHASE 7: *Approving Authority approves or rejects proposal, based on Assessment Review Document.*



The project proponent [identified in Table 9.2] first carries out screening by checking the Schedule of Prescribed activities [Phase 1 in Fig.9.1]. If EIA is required, then the Preliminary Assessment is prepared 'in-house' or by a consultant, and then submitted to the DoE for approval. If the Preliminary Assessment identifies any potentially significant residual environmental impact, then the project initiator proceeds with the Detailed Assessment, the objectives of which are:

1. to describe the significant residual environmental impacts predicted from the final project plan,
2. to specify mitigating and abatement measures in the final project plan,
3. to identify environmental costs and benefits of the project to the community.

[DoE 1987, p.6].

Although specified under Phases 4 and 5, in reality Detailed Assessment should continue during the project planning until the plan is finalised. Environmental data collection is necessary and the report is submitted to the independent ad hoc Review Panel which is set up by the DoE for each specific project. The Review Panel, through its secretariat i.e. DoE, submits its decision to the Approving Authority for a decision on the project The function of the Review Panel is as follows:

1. to critically review the Detailed Assessment reports,
2. to evaluate development and environmental costs and benefits of the final project plan,
3. to formulate recommendations and guidelines to the project approving authority relevant to the implementation of the project.

[DoE 1987, p.9].

The review process by the Review Panel takes a maximum period of two months. During that period, concerned environment-related agencies, and the public are invited to give comments. If the Review Panel recommends that the project should not proceed, the project initiator is allowed to revise or abandon his project.

9.3.5 Public participation

The EIA procedure does not indicate any formal phase for public participation. However Fig. 9.1 indicates the two phases where there are channels for public involvement. The first channel is during the preparation of the EIA report, where the project initiator is normally required to obtain public opinions on the project, possibly through surveys or dialogue sessions or meetings, or other channels of communication. The second channel is during the review of the Detailed Assessment. The independent Review Panel includes a member of the public, while other members of the public may submit written comments to the Review Panel within a stipulated period after an EIA report has been put on public display [Ho 1990, Omar 1990, DoE Malaysia 1992].

Public participation in Malaysian EIA has been poor. Records of written comments submitted for five detailed EIA reports reviewed between 1988-1991 show that the level of public participation has been low, except for the much-publicized proposal for developing Penang Hill [Table 9.4]. The figures show that public participation for EIA is much poorer than that for structure plans which were prepared during the same period [which is already considered as poor] in Chapter 8.

TABLE 9.4: PUBLIC PARTICIPATION ON DETAILED EIA REPORTS IN THE PERIOD 1988-1991.

Date	Project	Number of Written Comments
30 March 1989 - 30 April 1989	Tioxide	None
4 October 1990 - 3 November 1990	MTC	None
30 September 1990 - 30 October 1990	PUB - Linggiu Dam	6 [before closing date]
12 August 1991 - 12 September 1991	Penang Hill [Bukit Bendera]	419 [before closing date] 953 [after closing date]
12 August 1991 - 12 September 1991	Sungai Buloh	10 [before closing date] 2 [after closing date]

Source: DoE Malaysia 1992.

9.4 PROGRESS AND PROBLEMS

9.4.1 Introduction

This section examines some of the progress and problems in the preparation and review of EIA reports by DoE. Problems faced in EIA can be used as lessons in instituting SEA in the planning process, and are therefore outlined below, for reference in Part 3.

9.4.2 Preparation of EIA reports

Since its enforcement in 1988, there has been a steady increase in the number of EIA reports which are submitted to DoE for review and approval [see Table 9.5]. Most of the EIA reports are in the top eight activities of infrastructure, recreation and tourism development, industries, housing, quarries, petroleum, waste treatment and disposal, and power generation and transmission, all of which are normally related to urban and industrial development.

The above situation reflects increasing environmental problems which are associated with urbanisation which is growing at a very fast rate in Malaysia, as described in Chapter 7.

One would also expect that the number of projects under the same activities, but which are not required to submit EIA, by virtue of their size of development, are increasing too. These small developments are developed without any consideration for their cumulative environmental impacts, and is a cause for concern.

TABLE 9.5: CASES FOR EIA IDENTIFIED BY DOE AND THE NUMBER OF EIA REPORTS SUBMITTED TO DOE

ACTIVITIES	EIA Reports for review by DoE					
	1988	1989	1990	1991	1992	1988-1992
Infrastructure	0	1	17	40	19	77
Recreation and Tourism Development	0	0	15	33	17	65
Industries	1	9	16	24	15	65
Housing	1	3	9	21	17	51
Quarries	0	3	13	17	10	43
Petroleum	4	5	14	10	6	39
Waste treatment and disposal	1	3	10	1	5	20
Power generation and transmission	2	3	1	5	3	14
Land reclamation	0	3	3	3	3	12
Forestry	0	0	2	9	0	11
Mining	1	1	7	1	1	11
Water supply	0	1	3	2	1	7
Drainage and irrigation	1	1	0	3	2	7
Agriculture	0	1	0	3	2	6
Petroleum development in the Economic Exclusive Zone	0	1	0	3	0	4
Ports	0	0	2	0	0	3
Railways	0	0	1	0	0	1
Fisheries	0	0	0	1	0	1
Transportation	0	0	0	0	1	1
Airports	0	0	0	0	0	0
	11	36	113	176	102	438

Adapted from DoE Malaysia 1992b.

One of the greatest fears for EIA which has been identified in developing countries [in Chapter 4] is that it causes project delays and increases project costs and therefore is not encouraging to project proponents. This fear is also present in Malaysia and was also voiced by land use planning and environmental experts who were interviewed on the proposal for integrating SEA into land use planning. This issue is considered pertinent, and merits attention. For this purpose, Table 9.6, which illustrates the number of man-months and costs of carrying out EIA studies according to activity between 1988-1991 is also included here.

The minimum cost of an EIA study is RM 4,000.00 for a recreational development project which also took the least time to prepare i.e. one man-month. The maximum cost is RM2.27 million for a petroleum development project which also took the longest time to prepare i.e. 71 man-months. The minimum percentage of costs of preparing EIA reports to the total project costs is 0.001 % for a recreation project, and the maximum is 1.8 % for a waste treatment and disposal project.

TABLE 9.6: MAN-MONTH AND COSTS OF CARRYING OUT EIA STUDIES ACCORDING TO ACTIVITY, 1988-1991, MALAYSIA

Category of Prescribed Activities	Number of cases	Man-month				EIA Costs [RM]				Cost of EIA as Percentage of Project Cost [%]			
		Min.	Max.	Mean	Med.	Min.	Max.	Mean	Med.	Min.	Max.	Mean	Med.
Agriculture	1	1 0	1.0	1.0		30,000	30,000	30,000		N.A.	N.A.	N.A.	
Drainage and Irrigation	1	N.A	N.A	N.A		52,000	52,000	52,000		N.A.	N.A.	N.A.	
Land reclamation	2	12.0	12.0	12.0		50,000	202,000	126,120		0.057	0.297	0.177	
Fisheries	1	N.A	N.A	N.A		58,000	58,000	58,000		1.429	1.429	1.429	
Forestry	1	6.0	6.0	6.0		30,000	30,000	30,000		0.272	0.272	0.272	
Housing	16	2.0	5.0	3.1	3.0	15,000	50,000	31,860	35,000	0.003	0.249	0.064	0.020
Industry	29	2.0	24.0	7.3	6.0	25,000	1550,000	163,787	48,500	0.012	2.587	0.290	0.058
Infrastructure	28	2.0	24.0	7.3	4.0	16,000	220,000	48,400	40,000	0.011	0.398	0.101	0.050
Port	1	24.0	24.0	24.0		735,000	735,000	735,000		0.244	0.244	0.244	
Mining	2	N.A	N.A	N.A		60,000	195,000	127,850		0.381	1.471	0.927	
Petroleum	12	3.0	3.0	19.5	11.5	30,000	2270,000	577,222	422,000	0.016	0.401	0.167	0.104
Power generation and transmission	5	4.0	4.0	19.4		52,000	279,620	157,579		0.023	1.175	0.762	
Quarries	13	1.0	1.0	3.7	4.0	7,200	32,000	21,427	27,500	0.100	0.577	0.370	0.299
Resort and recreational development	23	1.0	1.0	6.8	5.5	4,000	142,000	42,526	35,000	0.001	0.547	0.084	0.028
Waste treatment and disposal	5	2.0	2.0			15,000	100,000	45,485		0.033	1.866	0.664	
Water supply	1	14.5	14.5	14.5		76,000	76,000	76,000		0.058	0.058	0.058	
	141												

Note: N.R. = No Report; N.A. = Not made Available.
Source: DoE Malaysia 1992a.

There is no standard measurement which determines the appropriate cost and time of preparation of EIA reports. Therefore it is not possible to categorize these man-months and costs as below or above standards. Nevertheless the figures show very low percentages in relation to the total projects cost, and therefore should not be much cause for concern. However at this stage, it is difficult to make a judgement whether or not these percentages will be similar in SEAs.

9.4.3 Problems

The biggest problem faced by DoE is the complaint by project proponents that the EIA procedure takes too long and causes delay to development projects. In view of this the Federal Cabinet, on 15 January 1992, had instructed the Malaysian Administration Modernization Planning Unit [MAMPU] of the Prime Minister's Department, to review the existing implementation procedure of EIA. The examination of the problems below is a summary of the report by MAMPU [1992]. The experience in overcoming problems in project EIA are relevant for the introduction of SEA, and are therefore appropriate to be outlined below:

Two major problems in the system and procedure of reviewing and approving EIA reports were identified:

1. The review and approval of EIA reports takes too long; and
2. EIA reports which are submitted are not in accordance with project planning phases as specified by Section 34A of the Environmental Quality Act.

The review by MAMPU identified the following reasons for the above problems, as well as several recommendations for overcoming them:

PROBLEM 1: EIA procedure takes too long to complete.

<u>Reasons for Problem 1</u>:

1. Incomplete information in the reports;
2. The procedure is not systematic;
3. Lack of reviewing officers at DoE; and
4. Lack of expertise and experience of reviewing officers.

<u>Recommendations for Reason 1</u>:

1. DoE is to prepare a uniform format of EIA reports for all prescribed activities;
2. DoE is to prepare a checklist of all required information;
3. DoE is to review and improve the EIA Handbook of 1987; and

4. DoE is to institute a system of registration of consultants in EIA, so that only registered consultants can undertake EIA studies.

Recommendation for Reason 2:

1. DoE is to institute a new procedure as recommended in the report;

Recommendation for Reason 3:

1. DoE is to use more appropriate time schedules to review EIA reports, and to submit justifications for increased manpower to the Public Services Department;

Recommendation for Reason 4:

1. DoE is to place its officers with local enterprises for experience, organise more visits to factories, etc, and to institute a programme for courses for its officers, so as to broaden knowledge and experience.

PROBLEM 2: EIA Reports submitted not according to planning schedule.

Reasons for Problem 2:

1. Approving authorities do not incorporate EIA as a condition for project approval; and
2. Lack of awareness by project proponents of the necessity to prepare and submit EIA reports at the early stage of project planning.

Recommendations for Reason 1:

1. Approving authorities are to institute a ruling that EIA reports are to be submitted together with applications for project approval; and
2. If EIA reports are not submitted together with the application, approving authorities can only give conditional approvals, on condition that EIA reports get DoE approval, before final project approval.

Recommendations for Reason 2:

1. DoE is to be a member of every committee which gives recommendations for project approval;
2. DoE is to organise more seminars/dialogues/forums with project proponents and consultants to stress the importance of EIA during project planning; and
3. DoE is to increase the publicity on the importance of EIA through mass media.

9.5 POTENTIAL FOR SEA

9.5.1 Introduction

Although SEA is widely acknowledged and adopted in many advanced countries, as described in Chapter 4, it is relatively unknown in Malaysia, as found out during interviews with land use planning and environmental experts there. This situation makes the introduction of SEA into the Malaysian planning scene a very challenging task, although during the

interviews there was a majority positive opinion for the proposal, albeit with some cautions on implementation problems.

A sound approach is to learn from the experience in the development of EIA and its implementation, and develop an approach that is conducive and applicable to the Malaysian political and institutional framework. As Ho [1990] summarised "Experience so far in Malaysia has shown that implementing EIA requires careful thought and requires that local issues are given the necessary considerations ... a flexible approach is necessary to take care of problems that may not have been anticipated earlier ... It would be best to test the proposed procedures ...and clear such problems prior to full implementation of the procedure ... the necessary commitment from policy makers, plan approving authorities and project initiators is necessary" [Ho 1990, p.318].

One particular aspect that is considered crucial in the development of SEA is institutional strength; for as already examined in Chapter 4, SEA, more than EIA, needs tremendous input from government machinery if it is to function effectively. This is particularly so when, as examined in Chapter 8, the land use planning profession [in TCPD] has a serious shortage of manpower in land use planning, and much more so, in the other fields of expertise which have relevance to SEA. This means that SEA's ability to function depends on the role played by other government departments besides TCPD and DoE.

As SEA develops from EIA, it is appropriate to examine the role played by government agencies in EIA, in order to assess the potential role that they can play for SEA. Having that in mind, this section examines the EIA scene in terms of government departments' involvement, their contributions, and the issues which they consider relevant for EIA. The examination determines the potential to implement SEA within the institutional setting in Malaysia.

The following information has been derived from the Information Availability Survey which is described in Chapter 1.

9.5.2 Involvement in EIA

Out of 49 departments which responded to the survey, 41 [83.4%] indicated that they are involved in EIA in one way or another. The negative answers from 8 departments indicate their interpretation of 'EIA involvement', which indirectly indicate their attitude to EIA. The Johor State Works Department and the Johor State Agriculture Department for instance, gave negative answers because the EIA activity is only listed in their Federal Headquarters. In actual fact, being on the ground, they are important sources of information to project proponents and EIA consultants. The same conclusion can be made of other departments whose

activities are environment-related [defined by DoE 1987], but where EIA is not listed as a departmental activity.

Table 9.7 indicates the different levels of involvement in EIA by different agencies. 74% of the respondents are aware of the relevance of their activities to EIA, but only 60% have participated in EIA. These percentages correspond to only 44% and 36% out of the total survey sample respectively. While only 29% have personnel who have any form of training in EIA, only 16% have any departmental training programme for EIA. Perhaps an indicator which indicate their perception of EIA is the fact that only 39% stated that they have environmental data, when in fact, they have 'environment-related' activities.

TABLE 9.7: LEVEL OF INVOLVEMENT IN EIA BY GOVERNMENT DEPARTMENTS

Awareness indicators	No.of Respondents	As % of Respondents	As % of Survey Sample
Comprehension of 'environmental data'	19	38.7	23.5
Availability of personnel with training in EIA	14	28.6	17.3
Availability of training programmes for EIA	8	16.3	9.9
Have participated in EIA projects	29	59.2	35.8
Awareness of relevance of activities to EIA	36	73.5	44.4

Information Availability Survey of Malaysian Government Departments, July-October 1992

Of the 29 departments which have participated in EIA projects, the majority [86%] participate in the form of providing comments to DoE, followed by those who are actively involved by being members of EIA teams [69%]. These two groups form 51% and 41% of the total respondents respectively [Table 9.8]. While 62% participated by providing information to EIA preparers, only 24% provide advice to project proponents/EIA consultants. These figures indicate only a fair level of involvement in EIA by government departments, which project a difficult task in introducing SEA in land use planning.

TABLE 9.8: LEVEL OF PARTICIPATION IN EIA BY MALAYSIAN GOVERNMENT DEPARTMENTS

Level of Participation	No of Respondents	As % of Depts which participate	As % of Total Respondents
Provide information to EIA preparers	18	62.1	36.7
Provide advice to proponents/EIA consultants	7	24.1	14.3
Member of EIA Review Panel	8	27.6	16.3
Member of EIA Team/Consultants	20	69.0	40.8
Provide comments to Dept. of Environment	25	86.2	51.0
Provide advice to local planning authorities	2	6.9	4.1

Information Availability Survey of Malaysian Government Departments, July-September 1992

9.5.3 Environmental issues

74% of the survey respondents have given their opinions on what they consider are environmental issues which should be considered in/for EIA. The opinions cover a relatively broad range of issues which have been grouped into 10 categories, as shown in Table 9.9. It is significant that the issues cover socio-economic-institutional aspects, beside biological. The issues cover socio-economic aspects; rural development; transportation; water supply; primary industries; agriculture; national parks; urban development; culture, arts and tourism; and training.

The issues identified by the departments generally confirm the list of problems in developing countries which are examined in Chapter 4. However it is promising for SEA that some of the environmental issues identified by the departments are beyond the scope of conventional project EIA in Malaysia. Among issues which are most pertinent to SEA are the consideration of socio-economic development policies; use of socio-economic research; enhancing quality of life; management of land use development in water catchment areas; information [data] bank relating to physical environment; development, redevelopment, resettlement and public housing, urban renewal and new towns development; full consideration of environmental impacts of development in land use development plans; and the importance of research programmes at government departments and educational institutions. On the implementation of SEA, relevant issues are the suggestion for manpower training for EIA; the need for the availability of trained personnel in multi-disciplinary interests covering basic and applied sciences and social sciences to manage EIA; and the need for closer cooperation and collaboration between government departments, private sector bodies and educational institutions in EIA preparation, and in environmental planning, research and management.

9.5.4 Training in EIA

From the survey of Malaysian government departments with 'environment-related' activities, only eight departments reveal that they have training programmes in EIA for their personnel. This forms only 16% of the respondents and 10% of the total sample, thus reflecting the low priority given to EIA. The types of programmes vary [see Table 9.10]. The DoE for instance has a more comprehensive programme with the objective of enhancing the awareness of EIA among developers, decision-makers, professionals, and the public. This is conducted in association with government departments, public training institutes, professional organizations and non-governmental organizations.

TABLE 9.9: IDENTIFICATION OF ENVIRONMENTAL ISSUES FOR EIA BY ACTIVITIES

SOCIO-ECONOMIC
- Consideration of socio-economic development policies.
- Use of socio-economic research.

RURAL DEVELOPMENT
- Regrouping of Orang Asli [Aborigines].
- No cleared land should be left longer than necessary.
- Consideration of method of shredding and cutting of oil palm trees instead of open burning in the replanting programme.
- Beautification and environmental improvement of FELDA agricultural villages to enhance the quality of life of villagers.
- Land development for agriculture, tourism, mining, quarrying, township, infrastructures, reclamation of swamps for aquaculture, industrial development, palm oil mills and rubber processing plants.

TRANSPORTATION
- Marine pollution and dumping of wastes in port areas.
- Port Development Plans should consider impacts of dredging and reclamation works, construction/expansion, and development of port-related industries and port infrastructure.
- Industries near ports must be environmentally-friendly and safe of risks/hazards in relation to port assets.
- Design of roads and bridges through new alignments.
- Design of airport facilities.

WATER SUPPLY
- EIA in project planning and project inception stage of water supply facilities.
- Management of land use development in water catchment areas/river basins, recreational or tourism-related development in national parks.
- Erosion as a result of earthworks, particularly in the water catchment areas.

PRIMARY INDUSTRIES
- Practice of selective logging instead of clearfelling in the forests.
- Management of toxic wastes by the tin-based products and the radiation hazard in tin sheds and among plants.
- Proactive promotional activities such as creating public awareness on efforts to rehabilitate ex-mining lands.
- Ensure that all mitigating measures are implemented.
- Importance of post-EIA monitoring.

AGRICULTURE
- Information [data] bank relating to the physical environment.
- Expertise in providing appropriate mitigating measures in soil erosion control and water management.
- Manpower training for EIA.
- Establishment of large livestock farms.
- Construction of dams, drainage schemes, land reclamation in coastal areas.
- Monitoring of pesticides and agro-chemical use and their impacts on the environment.
- Monitoring data on metal pollution and their impacts on the fisheries sector and marine parks.
- Conversion of forest land to agricultural land.

NATIONAL PARKS
- Wildlife /fauna in national parks.
- Recreational or tourism-related development in national parks.

TABLE 9.9: ...CONT.

URBAN DEVELOPMENT

- Development, redevelopment, resettlement and public housing, urban renewal and new towns development.
- Planning and implementation of major housing programmes.
- Land use development plans must take full consideration of environmental impacts of development.

CULTURE, ARTS AND TOURISM

- Preservation of historic monuments and buildings and sites, and research on archeological sites.
- Tourism-related facilities in coastal areas and national parks.

TRAINING

- Availability of trained personnel with multi-disciplinary interests covering basic and applied sciences and social science.
- Importance of research programmes at government departments/agencies and educational institutions.
- Cooperation and collaboration between government departments, private sector bodies and educational institutions in EIA preparation, and environmental planning, research and management.
- Manpower planning for the preparation of EIA.

Information Availability Survey of Malaysian Government Departments, July-October 1992.

The Public Works Department, Petroleum Nasional and the Agriculture Department have their own training programmes which are conducted at their own departmental training institutes. These are specialised courses which are for specific functions. The Agriculture Department for instance, conducts courses which are geared to practical soil erosion control and water management techniques, where evaluation of land attributes such as soil physical and chemical properties, terrain and other environmental-related parameters are also highlighted. Other departments like the Town and Country Planning Department and Kuala Lumpur City Hall only have programmes to have officers trained in EIA at universities or training institutes like the Institute Tadbiran Awam Negara [INTAN] i.e. the National Institute of Public Administration Malaysia. The Agriculture University [Science and Environment Faculty] has the most formal training programme, in the form of two courses at undergraduate level. Like the other universities, particularly the Science University and the University of Technology, there are integrated multi-disciplinary programmes which cover basic and applied sciences and social research. A large proportion of the academic staff have been involved in preparing EIA reports as well as evaluation of EIA reports.

INTAN has a very formal and wide range of organised courses in EIA. These courses are conducted at the main campus as well as the branch campuses on a regular basis twice a year. The courses are mainly directed at officials who are responsible for the assessment of environmental impacts, from government and quasi-government bodies. They include land administrators from the Land and Mines Department, project planning officers, and officials

TABLE 9.10: EXAMPLES OF DEPARTMENTAL TRAINING PROGRAMMES IN EIA

Department of Environment [DoE]
To enhance the awareness of EIA among developers, decision-makers, professionals, and the public, the Department present lectures, briefings and seminars on EIA and issues related to its implementation, in association with government departments, public training institutes, professional organizations and Non-governmental organizations, etc.

Briefings are held for project proponents and consultants and advice and guidelines are contained in departmental booklets such as 'Environmental Impact Assessment [EIA] Procedure and Requirements' and in the departmental newsletter 'BERITA EIA' [EIA NEWS].

Public Works Dept. [Water Supply Branch]
The target groups in the training programmes are designers/ engineers involved in project construction or operation. The department is in the process of setting up one 'EIA Unit' under the Design and Specialized Engineering Branch in the near future. The departmental programme is:
- Conducting workshops at the Public Works Department Training Institute [IKRAM] with the Department of Environment.
- Organizing and delivering talks on EIA pertaining to Public Works Department projects.

Public Works Dept. [Road Design & Research Section]
Under the Highway Rehabilitation and Improvement Project Loan 3145, from the World Bank to the Malaysian Government, one of the project component is the provision of consultants services and technical assistants to establish methodologies for determining the environmental impact of road works within the Road Section of the Public Works Department of Malaysia. The departmental programme is:
- Conducting workshops at the Public Works Department Training Institute [IKRAM] with the Department of Environment.
- Organizing and delivering talks on EIA pertaining to Public Works Department projects.

National Petroleum [PETRONAS]
A course in EIA is conducted at the PETRONAS Training Institute [PERMATA]

Agriculture Department
The training programme is geared to practical soil erosion control and water management techniques. Evaluation of land attributes such as soil physical and chemical properties, terrain and other environmental-related parameters are also highlighted.

Town and Country Planning Department
There is no formal training programme but a programme to have officers trained in EIA at local and external institutions, e.g. at the Institute for Public Administration, and universities. Land Use Planners are sent for short and long post-graduate courses in environmental science and management. Planners are also exposed to EIA and its implementation during seminars and workshops organized by DoE, and professional organizations.

Kuala Lumpur City Hall
There is no formal training programme except for exposing personnel to EIA at short courses and seminars.

Agriculture University [Science and Environment Faculty]
The faculty offers two courses at undergraduate level in the B.Sc. [Environment] programme: [a] SAS 354 Environmental Impact Assessment; and [b] SAS 475 Environmental Impact Assessment for Developing Countries.

Information Availability Survey of Malaysian Government Departments, July-October 1992.

who are responsible for project implementation at the state and local level. Courses are conducted with guest lecturers from DoE, other government departments and universities, as well as private consultants who are normally invited to talk on case studies. International speakers are also invited at workshops and seminars, such as speakers from the Centre for Environmental Management and Planning [CEMP], Aberdeen; Institute of Environmental Assessment, UK; Curtin University of Technology, Australia; the World Health Organisation, the World Bank and many others [INTAN 1990, 1991, 1992a, 1992b, 1992c, 1993a, 1993b].

EIA workshops are also organised for project managers and assessors, such as 'Quality Assurance in EIA' and 'Environmental Risk Assessment and Control Technology'. These workshops are normally organised jointly with DoE and other professional bodies such as the Malaysian Institute of Planners [MIP] and Environmental Management and Research Association of Malaysia [ENSEARCH].

The objectives of the courses and workshops are mainly: [i] to promote the understanding and experience of participants on the concept and function of EIA; [ii] to expose participants to the formulation of the Terms of Reference for an EIA, through the use of case studies; and [iii] to manifest how results from EIA can be incorporated into project planning.

The examination of the EIA training programmes above indicate that there is no shortage of avenues for training in EIA at all levels. Given the finance and manpower, and with political will, these training programmes can be strengthened to include a programme for SEA when it is required.

9.5 CONCLUSIONS

The history of EIA, and the experience from its development; its underlying policies and strategies; its concept; legislative and institutional framework and procedure; the level of involvement of government agencies in the EIA system and their awareness of the importance of environmental assessment and EIA; the availability of training avenues for EIA; and the progress and problems and the recommendations which are related to them, are very important lessons from the Malaysian EIA system that can contribute towards the development of SEA for Malaysia. The fact that the system was first enforced on an institutional basis, before the EIA legislation was introduced, indicates the cautious and experimental approach taken. This is in line with the philosophy that any introduction of a 'foreign' concept requires careful thought and requires that local issues are given the necessary considerations. It also points to the requirement of a flexible approach to take care

of problems that may not have been anticipated earlier when developing the system. The need for tests and experiments is clear, as proven by the experience in EIA.

Malaysian EIA was devised for project planning and approval. The Act and the EIA Handbook make no provision for impact assessment of more generalised or strategic development plans or land use plans. There seems to be a complexity in the institutional set-up; while DoE is the approving authority for EIA reports, it does not play an active role in the implementation of the projects, a fact that has created problems in the implementation of EIA. There is no formal provision for public participation, and this results in a very poor performance by the public.

The majority of the EIA reports are for projects which are associated with urban and industrial developments, such as infrastructure, recreation and tourism development, industries, housing, quarries, petroleum development , waste treatment and disposal, and power generation and transmission. This reflects increasing environmental problems which are associated with urbanisation which is growing at a very fast rate in Malaysia. One would expect that the number of projects under the same activities, but which are not required to submit EIA, by virtue of their size of development, are increasing too. These small developments are developed without any formal consideration for their cumulative environmental impacts. This is a cause for much concern.

Although the number of government departments which claim to have 'environmental' data are few in the survey, it is promising for SEA that many can identify issues that are suitable for SEA, and can identify their departmental activities with EIA. The number of departments with training facilities for EIA, and those with programmes for EIA training for their officers however are low and need to be addressed in Part 3.

Chapter 10

Key Malaysian issues

The examination of the Malaysian national planning system, land use planning system and the EIA system, has identified legislative, institutional, procedural and methodological frameworks for introducing and integrating SEA into Malaysian land use planning in particular, and the Malaysian national planning system in general. The key issues which have been identified will contribute towards the formulation of an effective SEA framework that operates within a national integrated planning system, towards social and economic changes within a sustainable society, in Part 3. These key Malaysian issues, which are grouped according to instruments for environmental action, are listed below:

KEY MALAYSIAN ISSUES

A. NATIONAL PLANNING SYSTEM

1. There is a very strong influence of the Federal government over state and local governments in planning and management;

2. There is a complexity of national, state and local administrative links;

3. The National Ideology [Rukunegara] is the foundation of all planning and management;

4. The institutional hierarchy and types of plans produced in the planning system 'fit' into the idealized strategic planning framework for planning and administration in the public sector;

5. There is a breakdown in the function of the strategic planning framework because of the structure of the local government system;

6. Due to the lack of finance and manpower, local authorities cannot perform their functions in the strategic planning framework effectively;

7. There are strong vertical links among agencies which are responsible over land use planning and among those which are responsible over socio-economic planning, but there is a very weak link between the two groups;

8. The development strategy in the OPP2 1991-2000 and SMP 1991-1995 is environment-led and there are strong elements of sustainable development included in national policies and strategies;

9. The OPP2 and SMP do not outline the strategies for sustainable development explicitly, and the framework for land use planning is very weak and therefore much is left to interpretation at the local level;

B. LAND USE PLANNING SYSTEM

10. The Town and Country Planning Act 1976 provides the framework for a strategic planning system, but the accompanying local government system causes its breakdown;

11. Due to the lack of finance and manpower, local authorities are not performing their responsibilities as local planning authorities effectively, particularly in the preparation of Development Plans for their areas;

12. The State Planning Committee has a very strong role in the land use planning system, but at the moment is not very effective, due to limitations in the State Town and Country Planning Department [State TCPD] and local authorities;

13. Federal TCPD, with the assistance of State TCPD, play the most important role in the preparation of structure and local plans.

14. There is a strong influence of the TCPD in the planning of local authority areas and on land use planning matters at state and federal level;

15. Existing structure plans perform poorly in the consideration of land use planning criteria for sustainable development;

16. There are positive opinions on the integration of SEA within the land use planning system, within a national integrated planning system, but with cautions on legislative, institutional and financial problems in its implementation.

C. STRATEGIC ENVIRONMENTAL ASSESSMENT AND EIA

17. The development of the existing EIA system provides valuable lessons and experience in the development of a SEA system for Malaysia;

18. For any system to function effectively, there is a need for strong interrelationship and interdependence of legislative and institutional machineries;

19. The number of government departments which are actively involved in EIA is low, but the number which seem to be aware of the need for EIA /SEA , and who understand the relevance of their activities to EIA/SEA, is promising;

D. LEGISLATION

20. The development of a SEA system must be accompanied by reviews of relevant legislation, particularly the Town and Country Planning Act 1976, The Local Government Act 1976 and the Environmental Quality [Amendment] Act 1985;

E. INSTITUTIONS AND TRAINING

21. There is a need for stronger cooperation and integration between government departments, quasi-governments, private consultants, developers, non-governmental organisations, and the general public, particularly as most agencies are currently facing manpower shortage;

22. There is a need for programmes to overcome institutional and resource deficiencies such as shortage in human resources, financial resources, lack of information on environmental and social systems, low status of planning and environmental departments, and the lack of information exchange;

F. CONSULTATION AND PUBLIC PARTICIPATION

23. Both Malaysian land use planning and EIA systems have poor levels of public participation, although the former fares better than the latter.

24. There is a need for a comprehensive programme for effective public awareness and participation in environmental concerns generally and in planning activities specifically.

Part 3

Proposals for Malaysia

Introduction to Part 3

The results of the analyses of philosophies and principles of sustainable development, land use planning and environmental impact assessment concepts, and their applications in Malaysia, are synthesized in this Part to formulate proposals for the integration of Strategic Environmental Assessment [SEA] into Malaysian land use planning. The key conceptual issues from Part 1 [The Conceptual Framework] and the key Malaysian issues from Part 2 [The Malaysian Framework] form the underlying philosophy, criteria and assumptions for the proposals which range from the proposed National Integrated Planning System to a list of immediate actions to be taken.

Chapter 11 iterates that the proposal to integrate SEA into the Malaysian land use planning cannot be treated in isolation. Accordingly the chapter proposes an Ideal National Integrated Planning System which integrates in it a hierarchical system of SEA for the various forms of policies, plans and programmes, from national to local level of governments. However emphasis is given to land use planning, and on this, an SEA [Structure Plan] system and process is proposed and described in the chapter. The chapter concludes with a list of methodological guidelines for the implementation of SEA [Structure Plan].

To put the proposals into action, Chapter 12 reviews the existing resources in terms of national development policies, current planning legislation, machinery, personnel and information, and identifies existing strengths and constraints. These strengths and constraints form the basis for the formulation of an outline strategy for actions in Chapter 13. The chapter defines the scope, approach and programme for actions, and identifies a list of tasks for immediate actions. The chapter also identifies the organisation which is charged with the responsibility of putting the proposals into effect.

Chapter 11

Aiming for the ideal

11.1 INTRODUCTION

The results of the analyses in Part 1 provide the justifications and conceptual framework for the concept of integrating SEA within the land use planning process which aims for sustainable development. Two main conclusive arguments put forward are [i] that land use planning lacks a systematic assessment of environmental impacts of land use proposals; and [ii] project EIA has shortcomings in its role towards sustainable development. One of the solutions to these shortcomings is the development of SEA which is proposed to be integrated within the land use planning system and land use planning process. To facilitate SEA, the examination of several approaches in national development planning, particularly in the ESCAP region, has produced some concepts which could be the framework for SEA, particularly for developing countries like Malaysia.

The examination of the principles of sustainable development concept in Chapter 2, land use planning principles in Chapter 3, EIA and SEA in Chapter 4, and several approaches to planning for sustainable development in Chapter 5, has culminated with a set of 23 key conceptual issues to be considered in the development of an ideal system of national development planning towards social and economic changes within a sustainable society. These conceptual issues in Chapter 6 are grouped according to the six instruments for environmental action which have been identified by UNEP: national planning system; land use planning system; environmental assessment; legislation and environmental law; institutions and training; and consultation and public participation. Basically these key conceptual issues form the operational features for the integration of SEA within the land use planning system, which, in turn, is integrated within a national environmental planning and management system.

In Part 2, the contextual study of the system of national development planning towards social and economic changes in Malaysia, through the examination of its national development planning system in Chapter 7, its land use planning system in Chapter 8, and its EIA system in Chapter 9, has identified legislative, institutional, procedural and methodological frameworks for introducing and integrating SEA into the Malaysian national

planning systems in general, and Malaysian land use planning in particular. The key Malaysian issues which have been identified in Chapter 10 justify this proposal as well as contribute towards the development of an effective SEA system in Malaysia. These key issues have also been grouped under the same headings as the key conceptual issues of Part 1.

While acknowledging the shortcomings in the Malaysian planning and environmental assessment systems, such as manpower and financial constraints at all levels of government, this thesis takes the stand that the best approach for the achievement of any system is by aiming for the ideal which, nevertheless, falls within the country's political-legislative-institutional framework, and has taken into consideration existing shortcomings, opinions of relevant experts, as described in Chapters 8 and 9. When reviewed against the existing resources, the ideal system will indicate the immediate actions that need to be taken in order to make the system operational.

Within the above context, this chapter sums up the justification for, and describes the proposed ideal SEA system [in section 11.3] which takes into consideration the key issues which have been identified, and is based on a justified underlying philosophy. The description of the system starts with the functions of Malaysian SEA in section 11.3.2, the proposed national planning system which incorporates SEA in section 11.3.3, the Malaysian SEA [Structure Plan], and methodological guidelines for Malaysian SEA [Structure Plan] in section 11.3.5. Significant issues arising from these are concluded in section 11.5.

11.2 THE UNDERLYING PHILOSOPHY

Amidst growing international and national concern for the environment, and amidst concerted efforts towards sustainable development, the Malaysian government, in its 'Vision 2020', has set a target for a GNP increase by eight times in twenty years. In keeping with its goal to be a developed nation by the year 2020, there is an urgent drive for modernisation, industrialisation and ultimately urbanisation. This sets the agenda for increasing utilisation of natural and human resources, which could, if unchecked, produce adverse impacts on the human and physical environment. In view of this, the traditional national planning methodology, which concerns itself mainly with an increasing rate of GNP, has to give place to an altogether new planning approach. The growth of GNP should be structured not only to assure a minimum per capita income but also not to go beyond the trade-off point between economic growth and the loss of amenities and depletion of natural resources. This approach is consistent with Chandrasekhara's [1975] hypothesis for developing countries, of which Malaysia is one.

Malaysian land use planning, which is acclaimed to be for the management of environmental changes in Chapter 8, cannot be treated in isolation, since it operates within

the national planning system. The integration of SEA into the land use planning system too has to be examined within a wider framework, since SEA is within a hierarchical system which covers a hierarchy of policies, plans and programmes at various levels of governments. Therefore any proposal to integrate SEA into the land use planning system and process has to be within the framework of the national planning system. For this reason, the ideal SEA system which is proposed for Malaysia is comprehensive, and covers the whole national development planning system, within which the land use planning system operates.

The ideal planning approach for Malaysia is the adoption of the integrated planning system, as opposed to comprehensive or co-ordinated planning. The definition of integrated planning by Leonhardt [1982] illustrates this concept explicitly:

> "... integrated planning is a *continuous process of related sequential and simultaneous actions* ... it should possess a substantial *management element* ... a guide to action, which, unlike comprehensive planning, *concentrates selectively on key issues* and, unlike co-ordinated planning, *does not seek to impose a rigid framework at any stage of the process.*"
> [Leonhardt 1982] - Italics are for emphasis.

The '*continuous process of related sequential and simultaneous actions*' of integrated planning is consistent with SEA which is considered as a '*process*' which combines both a *procedure* and a *method*. The 'procedure' is to ensure that all policies, plans and programmes are subjected to environmental assessment, and that all results influence the planning, decision-making and execution of policies, plans and programmes; and 'a method' is for analysing and assessing the effects of policies, plans and programmes on environmental systems and the quality of the environment, and the achievement of sustainable development.

The '*management element*' of integrated planning is consistent with the '*environmental management*' element which is the 'heart' of SEA, as opposed to 'environmental evaluation' which is the 'heart' of EIA. The former applies because SEA systematically includes the function of a *planning tool* [to minimize adverse impacts caused by a proposal, assuming the proposal will be approved], besides being a *decision-making instrument* [to decide upon acceptability of a proposal, based on its environmental costs]. Of particular significance in this context is the inter-relationship between SEA, political policy-making, and the longer-term interests of future generations which is the essence of sustainable development.

Environmental management in this context follows the regional analysis approach i.e. the focus is on the full range of impacts within a spatially defined area, such as a structure plan area in land use planning. Within the bounded area, the various interactions and linkages would be identified, giving this approach a distinct system analysis characteristics. The

rationale for this approach derives from the observation that environmental changes do not result from developments which occur in isolation.

Although the integration of SEA in planning is in support of rational planning, land use planning in Malaysia takes a 'disjointed incrementalism' approach rather than the rational approach. Therefore the prospects of undertaking EIA on radical alternatives are less alarming. If the 'mixed scanning paradigm', which is a comprehensive examination of parts of a system and an incomplete review of the rest [Voogd 1985] is adopted, the 'comprehensiveness' of the process is eliminated. This is because the problem of adopting the conventional paradigm of a comprehensive approach, which requires a lot of data, is avoided. In the mixed scanning paradigm which is proposed, a finite set of choice possibilities is assumed, instead of all conceivable alternatives to be identified and evaluated against all relevant objectives.

The SEA procedure, method and presentation for policies, plans and programmes, by their different nature, must be different. Therefore there cannot be any rigid process, method, form and content of the reports. This is consistent with the integrated planning concept which "*does not seek to impose a rigid framework at any stage of the process*".

The above comparison between integrated planning and SEA concepts serve to prove the compatibility of SEA within the integrated planning system. Below are descriptions of the approach and procedure of SEA which has been proposed for Malaysia.

The approach

The proposed approach for SEA in Malaysian land use planning is one of an SEA in plan making, i.e. an integrated SEA. SEA would be integrated into the planning process, and hence there would be integrated reports, such as the Draft National Spatial Plan/SEA Report, and Draft Structure Plan/SEA Report. These terms are explained in section 11.3.4. In this sense, SEA is a planning tool as well as a decision-making tool. The approach to be taken should fit into the planning process and the hierarchical decision-making structure.

If it is necessary to label the Malaysian SEA into descriptive terms used by Wood [1983], then the Malaysian SEA would be a combination of Plan EIA, Strategic EIA and Programme EIA. However SEA for structure plans cannot constitute the Policy EIA since that is for the assessment of national and legislative policies which is beyond the scope of land use planning, and it does not constitute Project EIA since that is already concluded as unsuitable for land use planning.

The description by Foster [1983] of the characteristics of different forms of EIA are adaptable to the Malaysian scenario and therefore have been adopted in the process-formulation exercise. The characteristics are summarised below:

Spatial Scale	Can be national, regional or local; distribution of localities or sites suitable to a particular category of development in a region.
Main subjects of analysis	Collections of policies constituting plan; sites or localities suitability to be defined; category of development or technologies suitability to sites or localities; linked series or actions over defined areas.
Alternatives	Different integrations of policy options; alternative ways of implementing policies; alternative series of localities or sites; alternative uses of sites or localities.

The above characteristics of EIA for policies, plans and programmes, are consistent with the proposal that the Malaysian SEA should not only apply to statutory development plans i.e. Structure Plan and Local Plan under Act 172, but should also be applied to all policies, plans and programmes, including the proposed National Spatial Plan and State Spatial Plans. With a flexible procedure and method to be adopted, this should be possible.

The procedure

The crucial factor in the enforcement of SEA is the understanding and appreciation of the rationale for integrating this form of EIA into the planning process by all parties concerned, including the planning team [which includes the environmental assessment personnel], the local planning authority, the working committees [which include the SEA Review Panel], the decision-making committees, and the approving authority. The complete appreciation of the system would mean the adoption of a procedure which is adaptable to the context of the environment being planned, by the relevant actors involved for the particular plan. This justifies the proposal for a flexible procedure for SEA to be integrated into the Malaysian planning process.

SEA has been developed from EIA. Therefore it is logical that its procedure is developed from the adaptation of EIA procedure, as long as it conforms to the principles of plans, policies and programmes. Taking this stand, examples of EIA procedures which are available in the numerous literature on EIA have been reviewed. Three processes by Lee and Wood [1978], Ministry of Environment, Ontario [1983], and Wood and Djeddour [1990] have been examined in Chapter 4, in addition to the Malaysian EIA procedure which is illustrated in Chapter 9. Several positive aspects from these procedures have been identified and considered in the development of Malaysian SEA.

The procedure by Lee and Wood [1978] is that of a project EIA. It starts from survey, prediction and analysis of environmental conditions and ends with post-auditing of impacts. The formal stage of consultation and public participation, and the inclusion of analysis of alternatives are two aspects that are not much imposed in project EIA in Malaysia and in most countries. The procedure by the Ministry of Environment, Ontario [1983] is of integrated environmental planning, in which EIA is integrated into project planning. In this procedure EIA starts from the identification of objectives and alternatives. The effects and impacts on the environment by the alternatives are studied, and mitigation possibilities are proposed. The EIS consists of a suggestion for the most acceptable alternative. The monitoring of the implementation, with all practical mitigation, is a part of the EIA procedure. What is emphasised in this procedure is the iteration exercise which follows from an informal system of consultation and public participation.

The procedure by Wood and Djeddour [1990] is of that of an SEA. The process stresses the importance of integrating the assessment activity into the formulation of the action. The procedure also involves the designation of the Lead Authority [LA], the Competent Authority [CA] and the Designated Environmental Authority [DEA]. The LA is the authority putting forward the action i.e. the authority undertaking the action. If this is applied to the Malaysian development plan system under Act 172, the LA should be the Local Planning Authority. The CA for policies, plans and programmes in the U.K. and the U.S. will often [but not always] be the lead authority, but in the Malaysian context, the local planning authority needs assistance from other agencies, in the form of the planning team, with the SEA process. The designated environmental authorities are similar to the agencies appointed as members of the EIA Review Panel in Malaysia. What is common with the other two procedures is the opportunity for consultation and public participation, and the inclusion of monitoring of environmental impacts as a part of the procedure.

As already emphasised several times, the political-institutional frameworks and characteristics of different policies, plans and programmes differ. Therefore any SEA process for a particular policy, plan or programme should differ. Due to resource limitations, only the SEA process in the preparation of a structure plan is developed for this thesis. Proposals for other planning processes which incorporate SEA have not been developed, until further development on the scope, content and process of preparing these plans have been established by the relevant planning authorities. It is adequate to emphasise at this stage that the procedures proposed for the structure plan is flexible enough to be adapted to any level of land use planning. The illustration and description of SEA [Structure Plan] is in section 11.3.4.

11.3 THE IDEAL SEA SYSTEM FOR MALAYSIA

11.3.1 Introduction

The ideal national SEA system for Malaysia, which is described in section 11.3.3, consists of several forms of SEA, which are consistent with the various forms of policies, plans and programmes at the respective levels of governmental administration. Basically the system is developed within a framework that enables it to perform the four identified functions which are described in section 11.3.2. Due to the different nature of policies, plans and programmes, the form and content of the respective type of SEA that can be used necessarily differ too. For an example, Fig. 11.1 shows an SEA [National Policies] and SEA [National Sectoral Policies] at the national level, and SEA [Programme] at the regional level. For land use planning, there is the SEA [National Spatial Plan] at the national level, SEA [State Spatial Plan] at the state level, SEA [Structure Plan] and SEA [Local Plan] at the sub-regional and local levels respectively.

The functions of Malaysian SEA [Structure Plan] are described in section 11.3.2. This is followed by an illustration and description of the Malaysian national planning system which incorporates SEA in section 11.3.3. Sections 11.3.4. and 11.3.5 describe the Malaysian SEA [Structure Plan], and the methodological guidelines, respectively. Although the emphasis is on SEA [Structure Plan], where it is relevant and appropriate, references to other types of policies, plans and programmes, and the respective forms of SEA, are also made.

11.3.2 Functions of Malaysian SEA

The key Malaysian issues which are listed in Chapter 10, backed by the key conceptual issues which are listed in Chapter 6, justify the identification of the following functions of Malaysian SEA :

1. To promote the management of environmental change;
2. To promote planning for sustainable development;
3. To promote a well-informed decision-making in the planning process; and
4 To overcome the shortcomings of project EIA.

The arguments for the above functions are explained below:

Promotion of management of environmental change

The strategic planning framework, which aims towards the achievement of national objectives and policies, has created a significant role for land use planning at regional and local levels, while the integrated planning approach ensures that land use planning plays its role at all

levels of planning and implementation. Within the Malaysian context, land use planning cannot be dissociated from the Malaysian Government's 'vision' of turning Malaysia into a "fully developed nation by the year 2020 not only economically but also in all other aspects" [OPP2 1991-2000, p.4]. Although NDP has only outlined the changes in terms of "social justice, political stability, system of government, quality of life, social and spiritual values, national pride and confidence" [OPP2 1991-200, p.4], it is implicit that these changes will be hand in hand with changes in the physical environment.

Physical changes are expected in the national landscape of Malaysia: conversion of rural to urban areas; conversion of agricultural to industrial areas; forests clearance for roads and amenities; opening of more land to accommodate the increase in population; greater exploitation of natural resources; and more. All these have to be guided by development policies and strategies which take into cognizance the diversities of Malaysians - ethnic, linguistic, cultural, socio-economic and religious as well as regional. These changes are expected in the path of achieving the NDP objective of "attaining a balanced development" and "growth with equity".

Before NDP, all policies, plans and programmes were developed with the main goal of achieving the objectives of NEP. It is to be expected that these policies, plans and programmes after the inception of NDP in 1991 have been and will be developed with the main goal of achieving the objectives of the new national policy.

The social, economic and physical changes in the country have to be guided so as to ensure that in the pursuit of economic development, adequate attention will be given to the protection of the environment and ecology, so as to maintain the long-term sustainability of the country's development. As emphasised in the NDP, "prudent management of natural resources and the ecology as well as preservation of natural beauty and clean environment are important to improve the quality of life for the present as well as future generations. The balanced development of the economy is essential to ensure stable growth, minimize social conflicts, promote racial harmony and enhance national unity." [OPP2 1991-2000, p.6].

The above scenario indicates that economic planning [currently the emphasis in the five-year national plans] alone cannot achieve the aspirations of the Malaysian government and Malaysians. Land use planning has to play the critical role of forecasting the resultant physical changes which follow social and economic development, and vice versa. Land use planning has to play its role in assessing the impacts of social, economic and physical development on the environment and accordingly streamline land utilisation and land use pattern towards achieving a quality of life, rural and urban.

One of the ways of managing environmental changes is through assessing the impacts of social and economic changes, and prescribing measures or mitigations to avoid or minimise any unavoidable negative impacts of these changes, particularly through a rational pattern of land uses. Structure and local plans under Act 172 provide good avenues for this, for their form and content ensure that they are more than physical plans. Structure and local plan policies and proposals on land uses have to be justified by physical, social and economic frameworks. By integrating SEA into land use planning, which in turn is integrated with socio-economic planning, environmental management is enforced at an early stage, where mitigation measures can be formulated as strategies and policies, instead of only as conditions attached to planning permissions which are given to individual development projects.

Planning with this function represents a proactive approach to environmental management, instead of a reactive approach which is normally associated with EIA.

Promotion of land use planning in planning for sustainable development

As examined in Chapter 7, the Malaysian government's commitment on environment is included as one of the strategies of NDP, which is to maintain the long-term sustainability of the country's development. The Langkawi Declaration on the Environment [1989] epitomized Malaysia's continued commitment to the global plan of action which is aimed at arresting possible environmental degradation and promoting environmentally-sound and sustainable development.

Within the above context, the Malaysian government has high-lighted the need for integrated project planning, and emphasised the role of EIA in project planning and implementation, under DOE 's responsibility. As far as land use planning is concerned, the SMP 1991-1995 only emphasises that the preparation of structure plans should continue to 'incorporate environmental considerations'. However the extent of 'consideration' is not mentioned. This state of affairs is inconsistent with the important role of land use planning in the management of environmental change, as described under the first function.

Notwithstanding the contents of the Malaysia Plan, development plans as provided under Act 172 can play a very important role in the achievement of sustainable development. As a tool which determines future land uses, and therefore future development and environmental change, it is crucial in determining sustainable utilisation of resources, preservation of the natural environment, and enhancing the quality of life in towns and countryside. However the analysis of four Malaysian structure plans in Chapter 8, which assesses the level of consideration of land use planning criteria for sustainable development, only shows a low achievement of 54 % average. The highest achievement is 62 % while the

lowest is 49 %. These figures indicate the need for an improvement in land use planning for the achievement of sustainable development in Malaysia.

The role of land use planning in achieving sustainable development in Malaysia is particularly crucial in urban areas, which are under the jurisdiction of land use planning more than the rural areas. This is perhaps due to the historical development of 'town planning' and the current legislative framework of land use planning in Malaysia. The 'town plans' under the old planning legislation, by their term, were prepared only for towns, while the first generation of structure plans in Malaysia were for the urban metropolitan council areas. Local authorities jurisdictions mainly cover urban areas, therefore planning and development control only cover urban areas. Even today urban areas are under more strict planning control than rural areas, which are not under the jurisdiction of a planning authority as provided by Act 171 [Local Government Act].

By adopting 'sustainable development' as a goal for land use planning, and by adopting the concept of 'sustainable urban development' as proposed by Breheny [1990] for urban areas in particular, land use planning can help to ensure that natural and man-made stock of resources are not so depleted that the long term future is jeopardised. Land use planning can relate development patterns to the utilisation of resources, for instance the relationship between the use of cars [private transport] to the level of carbon monoxide in the atmosphere; and the relationship between the use of public transport [such as the mass transportation system] and the reduction in the level of atmospheric pollution and traffic congestion in urban areas. Land use planning can also relate transportation patterns to settlement forms, thus bringing into consideration the atmospheric pollution problems [as related to the transportation system] in land use planning.

With the above in mind, planning for sustainability would encompass planning concepts such as urban forms, new settlements, settlement patterns, transportation patterns, and land use patterns, all of which are integrated with natural and man-made capital stock. In this respect, the concept of urban sustainable development is very relevant to land use planning.

When used as a planning goal, planning and management for sustainability can be monitored through the integration of SEA within the land use planning process. In this approach, any strategy and proposal would be assessed in terms of its impact on natural and man-made resources. Any avoidable negative impact would be detected and rejected at the early stage in the development process. Any unavoidable negative impact to the local environment [as a result of national social and economic policies] would be minimised through mitigating policies and measures which would be enforced from the early stage, so that unavoidable impacts are not widespread [although this may not be accepted as a rule].

Promoting well-informed decision-making in the planning process

The planning process in Malaysia involves a large number of agencies and organisations in plan-making as well as in formal decision-making. As examined in Chapter 8, every stage in the land use planning process involves decision-making by different non-environmental organisations; for instance the decision by the local planning authority on the terms of reference which is prepared by the planning team; the decision of the Technical and Steering Committees on sectoral/technical reports; and the decision by the State Planning Committee on the submissions by local planning authorities for its approval.

Organisation-wise, none of the local planning authorities in Malaysia can be considered as competent authorities in environmental management, or even in environment-related matters, since the majority of them do not have expertise in any planning or environmental field of study, with the exception of civil engineering in a few cases. Advice on planning matters are obtained from TCPD, while environmental matters are referred to DOE, whose role is also limited by the lack of manpower and experienced expertise. In the preparation of structure and local plans, DOE is only a member of the Steering Committee, and at most the Technical Committee too. Therefore decisions at all stages in the planning process are made by bureaucrats and technocrats from other fields, whose main concerns are naturally for their particular fields of expertise and jurisdiction. A systematic presentation of environmental impacts of decisions at all levels in the planning process will assist non-environmental officials and politicians to make decisions on policies and strategies which are non-environmental in their objectives.

The assessment of environmental impacts and its presentation in a form which is nearly akin to EIA will assist decision-makers to realise the implications of making decisions which are detrimental to the environment. This is particularly crucial in decisions on alternative strategies and policies. There would be ensured a procedure for decision-makers to take account of possible effects of development investments on environmental quality and natural resources productivity. Decision-makers would be informed of the pros and cons of decisions made at every stage of the planning process.

Overcoming shortcomings of project EIA

Much of the literature which popularises the advantages of applying EIA to policies, plans and programmes, sums up the reason for it as the shortcomings of EIA that is focussed on specific projects. Being reactive in nature [only impacts of projects being proposed by project initiators are considered] project EIA has overlooked many factors and projects which contribute to environmental deterioration.

Being relatively recent in its role in EIA enforcement, Malaysian DOE is facing the big responsibility of having to educate decision-makers and implementors in the importance of

EIA in the development process. Project-development in Malaysia has been so divorced from planning that it is very difficult to convince policy makers, plan approving authorities and project initiators to accept EIA as a planning tool. Therefore the enforcement of EIA as a prerequisite for planning permission for certain types of development is often considered as a big stumbling block to development, as it is taken to be the "cause of delays" in project implementation. Being understaffed itself, DOE has a big task in advising local planning authorities to enforce EIA.

The inadequacy of local authorities on environmental matters, and particularly in handling of EIA in development control, places a heavy burden on DOE. The department is the sole adviser on environmental matters and implementation of EIA regulations. This state of affairs could lead to considerable delays in some projects, thus causing antagonism towards EIA, not only among project proponents, but also among politicians and decision-makers.

While it is appreciated that not all development projects can be, or should be, subjected to EIA, it is also appreciated that due to the 'prescribed activities' concept of determining the need for EIA, many projects which fall below the threshold levels of the 'prescribed activities' and which have escaped assessment, have, at a later stage after implementation produced negative environmental impacts. As in the same system of EIA in other countries, project EIA in Malaysia ignores the additive effects of repeated developments in the same ecological system; it does not deal adequately with precedent-setting developments that stimulate other activities, especially in fragile environments; it ignores changes in the behaviour of ecological systems in response to increasing levels of perturbation; and it does not encourage the development of comprehensive environmental objectives that reflect the broad goals of society [Ahmad 1992].

11.3.3 Malaysian national SEA system

The proposed Malaysian national SEA system, which aims towards sustainable development through the four functions described in section 11.3.2, is developed in conformity with a set of criteria and is based on a set of assumptions. These criteria and assumptions are derived from the analysis of the conceptual framework and of Malaysian planning and environmental assessment systems, and the respective key issues which have been identified in Chapters 6 and 10.

The criteria

The goal of the SEA system is the achievement of sustainable development. Towards this end, the proposed system is developed based on the following criteria. Since these criteria

have been developed based on the results of the conceptual analysis and the Malaysian framework, there is no necessity to elaborate on them here.

1. The land use planning system operates effectively within a national strategic planning framework;
2. There is an integration of environment and economics in decision-making;
3. Land use planning is based on an interdisciplinary approach to integrate consideration of physical, biological, economic and other sciences;
4. Planning procedures comply with the three characteristics of [i] flexibility; [ii] match the characteristics of 'political ring'; and [iii] able to integrate research contributions;
5. There is a social response to environmental planning i.e. the outcome of the assessment depends on the criteria used, and these differ from group to group. Environmental assessment is not a purely scientific exercise but rather an informed expression of socio-political needs and aspirations;
6. Consultation and public participation is an integral component of the planning and decision-making process;
7. SEA functions and operates within a national integrated planning system;
8. SEA is integrated within the planning system and the planning process;
9. SEA deals with alternatives and impacts not covered adequately at the project level in more detail than other types of impacts, e.g. cumulative impacts.
10. The environmental evaluation approach is one which promotes sustainable development, because procedures which are perceived to act against economic growth opportunities are often unwanted; and
11. The impact assessment process is one which encourages early evaluation of socially responsible and realistic alternatives, directed at solving the problems associated with development instead of attempting to stop development;

The assumptions

The development, operation and effectiveness of the proposed system are based on the following assumptions:

1. All policies, plans and programmes aim for sustainable development and sustainable society;
2. All other existing political and institutional arrangements [other than those directly affected by this proposal] will remain in effect without substantial change for a significant period;
3. There is a more effective role by the local authorities as local planning authorities;
4. Decision-making is based on choice among alternative proposals;
5. Falling short of the rational planning model [due to shortage of data] the mixed scanning paradigm in planning is adopted;

6. There is an availability of sufficient and effective backing of complementary support for the system, such as trained human resources; financial resources; adequate information on environmental and social system; information exchange; effective interaction between government departments; the use of the Geographical Information System [GIS], and the like;
7. All management actions and designations will be adequately funded and staffed;
8. There is an effective mechanism for close interaction between managers, policy-makers, practitioners, and applied researchers;
9. There is an availability of expertise from related disciplines such as land use planning, ecology, biology, physics, biochemistry, agronomy, archaeology, sociology, economics, political science, climatology, medicine, geography, etc. to be involved in planning and environmental assessment activities;
10. The role of land use planners is not to be ecologists; but to utilize the knowledge from ecologists and environmentalists, and other specialists, to produce an 'environmentally sensitive plan';
11. Management problems can be resolved outside the structure plan/SEA system through administrative process;
12. There is an effective legislative and institutional framework for SEA within the land use planning system;
13. The SEA methods are able to make the values and norms upon which the results will be based explicit;
14. The operation of a structure plan/SEA process and method is attainable, for example in terms of the financial criteria; differences of opinions with other sectors or government plans or proposals; availability of policy instruments like grants, subsidies, etc; complexity of the implementation, etc;
15. There is an effective public awareness improvement programme;
16. There is an effective publicity and public participation programme;
17. There is a methodological eclectism i.e. the use of several methods of analysis rather than seeking to develop a 'one-step' comprehensive method;
18. There is a general awareness, concern and concerted effort among government departments, institutions of higher learning, research bodies, private sector experts, non-governmental organisations, and the general public, for the environment, and the need to integrate economic and environmental considerations in planning and decision-making; and
19. Falling short of immediate implementation, the operation of SEA in Malaysian planning system in general, and Malaysian land use planning system in particular, will be incremental.

The system

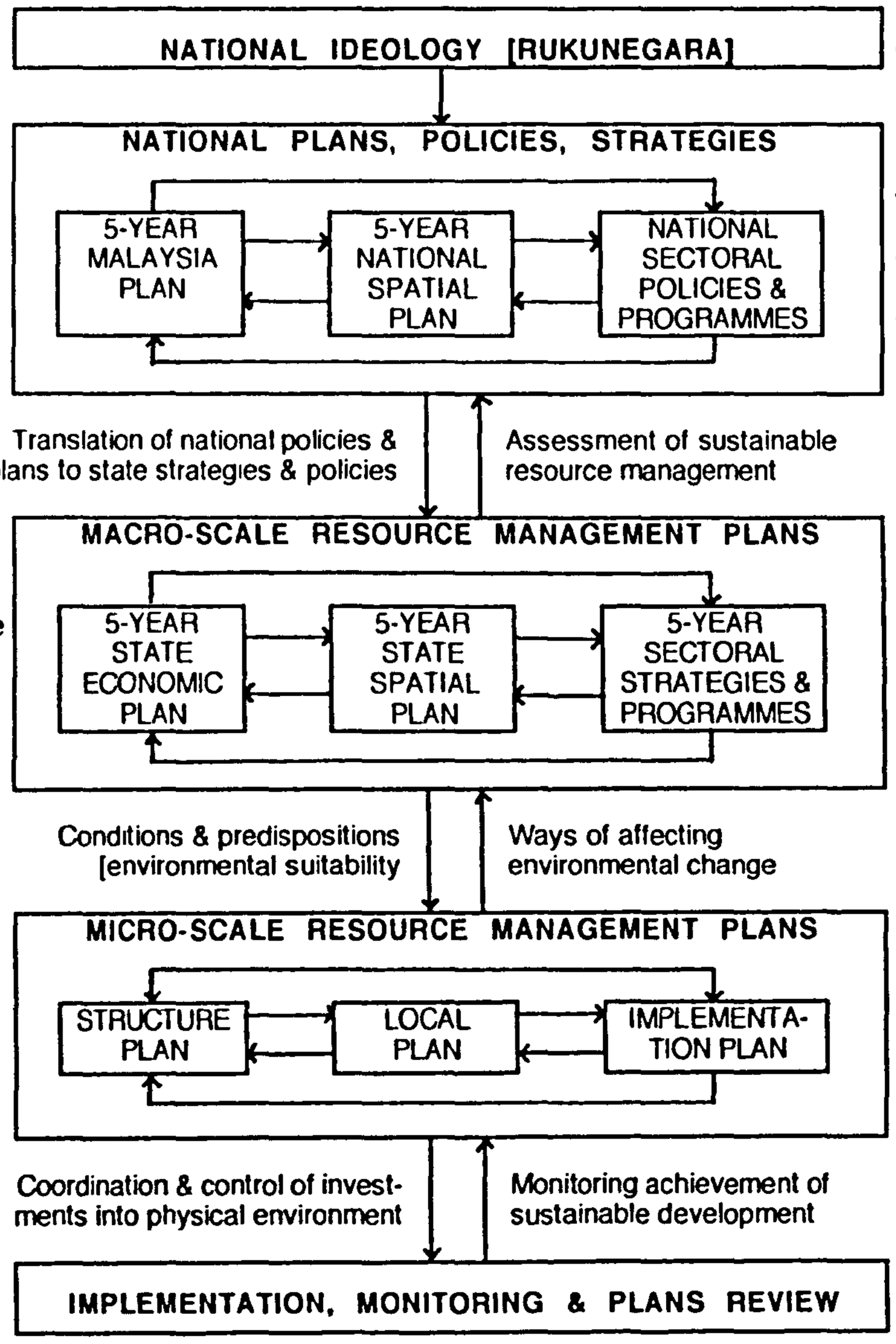
The proposed Malaysian national planning system in Fig. 11.1 shows eight forms of SEA which are associated with the various forms of policies, plans and programmes at national, regional/state and local levels. However the flexibility characteristic of SEA dictates that the types and number of SEA indicated is not conclusive. As the system develops, more types of SEA may be developed where and when necessary. Generally however these eight forms are expected to be the most critical, if the system is to perform the four functions described earlier.

The national planning system is based on the integrated planning approach which has adapted into it the strategic planning framework for social and economic objectives and policies. Rukunegara [National Ideology] is recognized as the national goal. To achieve this goal, resource planning and management is conducted through four levels of planning, namely:

NATIONAL GOAL:	Rukunegara [National Ideology]
RESOURCE PLANNING & MANAGEMENT LEVELS:	
Level 1: National Planning	National plans, policies, strategies
Level 2: Regional resource allocation and integration	Macro-scale resource management plans
Level 3: Local impact minimisation	Micro-scale resource management plans
Level 4: Implementation	Implementation, monitoring, plans review

The proposal accommodates the strategic planning concept where "... each level of planning forms a strategic function for the level below and conversely is constrained by the strategic planning of the level above" [Diamond 1979, in Bruton 1984]. However the five levels of planning in the framework for strategic planning and implementation have been reduced to four. Levels 3 and 4 of the strategic planning framework [local spatial implications and resource allocation and financing, respectively], have been combined into one, since under integrated planning, they fall under micro-scale resource management, i.e. Level 3 [Local impact minimisation] in the proposal. This is the solution to the weakness of Malaysian structure and local plans in resource management, which has been identified in section 7.3. Level 2 [Regional Strategies] of the strategic planning framework has been expanded to form Regional Resource Allocation and Integration, as a solution to the weakness identified at state/regional level planning, as also identified in section 7.3

FIG.11.1: PROPOSED MALAYSIAN NATIONAL PLANNING SYSTEM WITH SEA



	MAIN ANALYSIS	FORMS OF SEA
LEVEL 1: National Planning	• National Goal • Plans, policies & strategies to achieve national goal. • Assessment of spatial environmental [ecological] benefits. • Strategy of action: goal, objectives, strategies, policies	• SEA [National Policies] • SEA [National Spatial Plan] • SEA [National Sectoral Policies]
LEVEL2: Regional Resource Allocation and Integration	• Choice of alternatives in resource exploitation & development geared to conservation & preservation imperative to maintain a balance between natural amenities & man-made goods and services.	• SEA [State Economic Plan] • SEA [State Spatial Plan] • SEA [Programmes]
LEVEL 3: Local Impact Minimisation	• Collection of policies. • Sites or localities suitability to defined category of development. • Suitability to localities or sites	• SEA [Structure Plan] • SEA [Local Plan]
LEVEL 4: Implementation	• Linked series or actions. • Include impacts of projects	• SEA Audits

The major difference between the proposal and the strategic planning framework is that while the latter only determines vertical link between socio-economic and land use planning, the former determines vertical and horizontal integration between the two types of planning. Fig. 11.1 shows the integration between socio-economic plans and policies and land use plans and policies within Levels 1 and 2, and also integration between the various levels. The description of the proposed system below is on types of plans, policies and strategies, and their respective forms of SEA and main area of analysis for each level of planning and management. The links between the levels are mentioned where appropriate.

The proposal for a 5-Year National Spatial Plan in Level 1 is the solution to the lack of national framework and guidance for land use planning which has been identified in section 7.3. While it is recognized that there should be integration between socio-economic and land use planning, the proposal for separate plans are for the purpose of clarity and streamlining the planning and management frameworks. This proposal is also in line with the current proposal for a National Spatial Plan, which is still under study by EPU [FTCPD 1990, McLoughlin 1992]. The two 5-Year National Plans, supplemented with National Sectoral Policies, are then translated to state strategies and policies in the macro-scale resource management plans in Level 2, from which the assessment of sustainable resource management will form the feedback for their regular reviews.

Level 2 [Regional Resource Allocation and Integration] is more concerned with choice of alternatives in resource exploitation and development which is geared to conservation and preservation to maintain a balance between natural amenities and man-made goods and services, while striving for national goal and objectives. The plans in this level serves to fill the 'gap' between national policies and strategies and land use plans at the local level, as identified in section 7.3. Level 3 [Local Impact Minimisation] assesses the local environmental suitability of state/regional level plans and programmes, and in return provides the feedback to Level 2 on ways of affecting environmental change through the Implementation Plan.

In all levels of planning, policies, plans and programmes are subjected to assessment of their impacts on the environment, i.e. SEA which adopts the integrative process. An example is provided in the form of the SEA [structure plan] process in section 11.3.4. It is reemphasised here that the process is flexible and can be easily adapted to any form of land use plan in particular, and to other policies and programmes, albeit with more modifications.

Level 4 [Implementation] monitors the implementation of policies and plans and impacts of policies/plans, as well as of projects which result from them. This is done through coordination and control of investments into the physical environment and a review of SEA in

SEA Audits. To sum, up Level 4 monitors the achievement of sustainable development, and provides the most critical input to all the other levels of planning and management. The hierarchy of policies and plans, with the respective hierarchy of SEAs, provides the framework for effective environmental planning and management.

11.3.4 Malaysian SEA [Structure Plan]

This section describes the proposed Malaysian SEA which is meant for a structure plan under Act 172, and demonstrates how SEA is integrated into a planning process. The same principles can be adapted into other forms of planning, depending on the type and scope of planning, and the legislative-institutional frameworks of those policies, plans or programmes.

The SEA [Structure Plan] complies with the underlying philosophy [section 11.2] and criteria and assumptions [section 11.3.3]. Basically the typical Malaysian structure plan process [section 8.4] is expanded to integrate within it environmental impact assessment activities, so that planning and assessment is in one integrated process. The development of this process is also based on experiences from other approaches to environmental impact assessment in land use planning which are examined in section 4.6, and the SEA process by Wood and Djeddour [1990]. The strong and relevant points of these approaches have been identified and modified to suit the legislative-institutional framework of Malaysian structure plan process, and to comply with the underlying philosophy and criteria for Malaysian SEA. These strong and relevant points are summarised in Table 11.1.

The proposed process, together with the associated roles and responsibilities, are particularly related to the criteria in section 11.3.3, namely numbers 5 [social response to environmental planning], 6 [consultation and public participation as an integral component of planning and assessment], 8 [impact assessment is integrated in the planning process] and 9 [assessment of impacts of alternatives], and assumptions in the same section, namely numbers 3 [more effective role by local authorities], 6 [availability of sufficient and effective support such as manpower and finance], 8 [availability of effective mechanism for close interaction between all agencies and organisations involved in planning and assessment activities], 10 [planners need not be ecologists but utilize the knowledge from ecologists, environmentalists and other specialists] and 15 [availability of public awareness for effective public participation].

TABLE 11.1: STRONG AND RELEVANT POINTS FROM SEVERAL ASSESSMENT/PLANNING APPROACHES WHICH ARE RELEVANT TO MALAYSIA

Approach	Strong points which are relevant to Malaysian land use planning
AREAWIDE ENVIRONMENTAL IMPACT STATEMENT [AREAWIDE EIS]	• Assessment of alternative patterns of urban development or redevelopment. • Identification of cumulative impacts. • Identification of appropriate mitigation measures. • A tiered EIA system in which Areawide EIS sets the framework for project EIA. • Strong public participation input.
CUMULATIVE IMPACT ASSESSMENT [CIA]	• Incorporation of hypothesis testing and post-development audit of predictions. • EIA process feeds into and draws from regional ecological synthesis. • The link between cumulative impact management and land use planning. • The regional approach to CIA. • Use of the Geographical Information System for sustainability-oriented research. • Iterative assessment procedure.
PROGRAMMATIC ENVIRONMENTAL IMPACT ASSESSMENT [PEIS]	• Identifies environmental impacts of a group of actions that are mutually related either geographically or generically. • Tiering concept in which, when all significant issues cannot be treated in the PEIS, additional separate EISs are prepared on some or all of the individual actions covered by the programme. • Emphasis on public participation, particularly during the scoping exercise.
RESOURCE MANAGEMENT PLAN [RMP]	• EIS and land use planning are done at the same time, in a systematic, interdisciplinary approach to achieve integrated consideration of physical, biological, economic and other services. • Production of combined reports, such as the Draft RMP/EIS, Proposes RMP/EIS, and Approved RMP/Record of Decisions. • Operation of a 3-tier planning/assessment system, in which RMP is the middle-tier. National policies form the top tier, and activity plans form the lowest tier. • The planning process reflects the systematic planning/assessment procedure which follows after the rational planning model. • The planning/assessment approach is action-oriented and issue-driven, and decentralized.

TABLE 11.1: [CONT.]

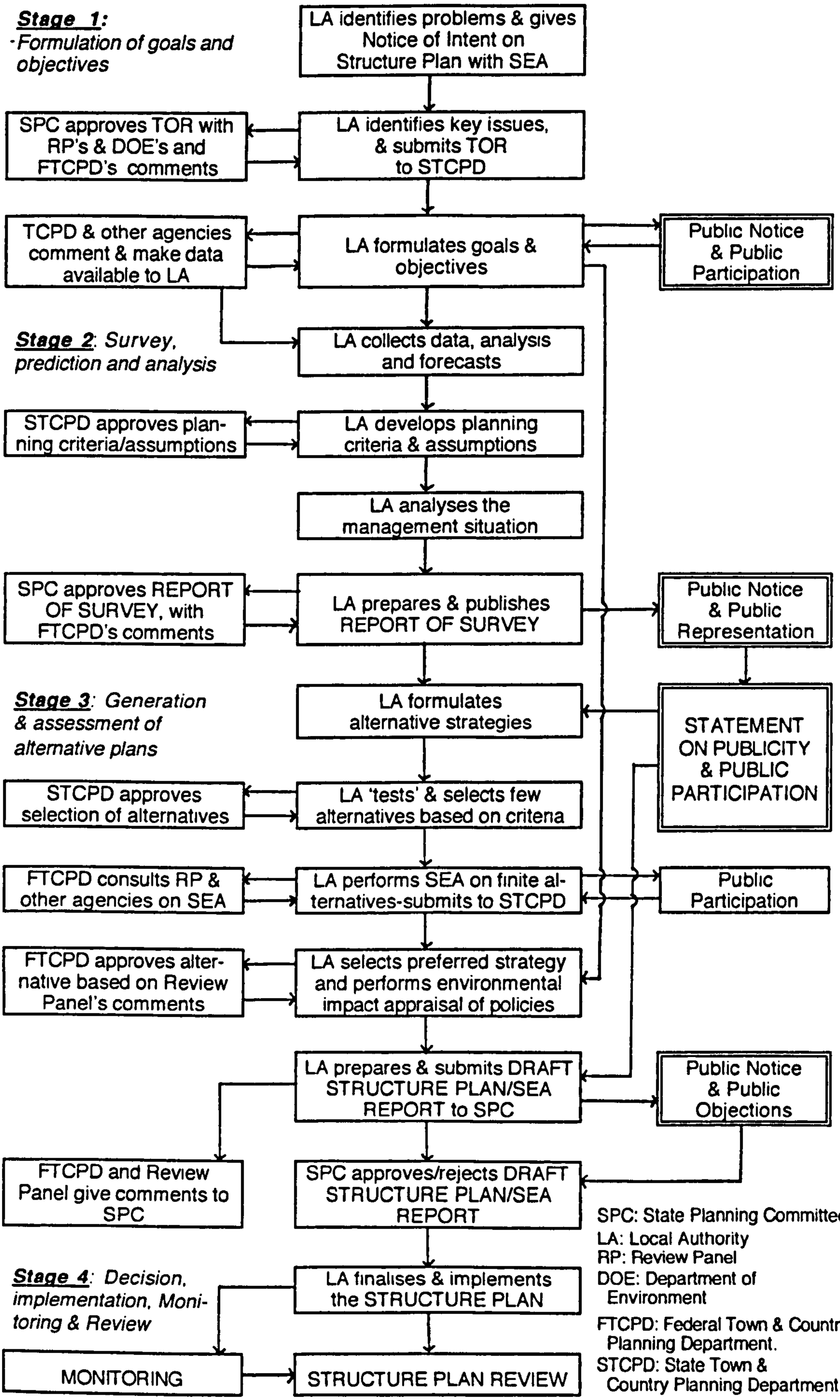
Approach	Strong points which are relevant to Malaysian land use planning
	• The key to RMP is the formulation and assessment of alternatives, including the No-Action Alternative. • Public participation is invited throughout the planning process, but is formally requested at four stages: identification of issue; development of planning criteria; selection of preferred alternative; and selection of Plan. • The use of the Geographical Information System.
SOCIAL IMPACT ASSESSMENT [SIA]	• Consideration of 'social' as opposed to 'socio-economic' impacts i.e. changes in social relations between members of an institution, community and society resulting from external change - all of which are related to social well-being or quality of life.
URBAN IMPACT ANALYSIS [UIA]	• Focus on direct and indirect impacts of policies on places and economics.
ULTIMATE ENVIRONMENTAL THRESHOLD [UET]	• Developed as a systematic process for analysing, formulating and evaluating a plan. • Integrates conservation and development towards sustainable development. • Strongly related to Threshold Analysis, which is a conventional tool in land use planning. • Provides information about the ultimate capacity of the whole planning area.
STRATEGIC ENVIRONMENTAL ASESSMENT [SEA]	• Tiered planning/assessment system. • Emphasis on consultation and public participation. • Importance of proponent-competent authority relationship. • Integration of SEA within the planning process.

Based on the experiences from other approaches, as summarised in Table 11.2, the underlying philosophy of Malaysian SEA and the criteria and assumptions described above, the process for the Malaysian SEA [Structure Plan] is developed and outlined below, followed by accompanying roles and responsibilities.

The process

Fig. 11.2 illustrates the proposed Malaysian SEA [Structure Plan]. The impact assessment element is integrated from the beginning of the planning process i.e from the Notice of Intent. To ensure integration between planning and assessment, the Terms of Reference [TOR] includes the proposal for impact assessment, and comments from an appointed Review Panel

FIG. 11.2: PROPOSED STRUCTURE PLAN PROCESS WITH SEA [STR. PLAN]



are received at this early stage. This is to ensure that the environmental impact assessment element prevails throughout the process; from the identification of issues and objectives in Stage 1, to data collection and development of planning criteria in Stage 2, to formulation and selection of alternatives for assessment, and the final plan selection in Stage 3.

The Review Panel gives its comments on the assessment of environmental impacts of alternative strategies prior to the selection of the preferred strategy, and then on the assessment of environmental impacts of policies. The most significant contribution of the Review Panel is its comments on the Draft Structure Plan/SEA which is viewed by the State Planning Committee when deciding on the Plan.

To ensure that the outcome of impact assessment is not a purely scientific exercise, but an informed expression of socio-political needs and expressions, the process includes a formal consideration of goals and objectives and planning criteria in the selection of the preferred alternative. The process also includes formal stages for consultation and public participation. Consultation between the local authority and other agencies runs throughout the planning process, but formal requests are made for their comments at five steps: on the TOR; formulation of goals and objectives; development of planning criteria and assumptions; selection of alternatives for impact assessment; and finally in the selection of the preferred alternative.

Public participation should be invited throughout the planning process, but formal invitations are made for their comments on four aspects: on goals and objectives; Report of Survey; assessment of environmental impacts of alternatives; and Draft Structure Plan/SEA Report. This contribution by the public, together with the other activities in the planning and environmental assessment activities, is to ensure a well-informed decision-making process by decision-makers. The roles and responsibilities of the various parties in the planning process are outlined below.

Roles and responsibilities

It is reemphasised here that by nature of the differences in their roles and scopes, SEA is different from EIA. It follows therefore that they should follow different procedures and methods, and be within different organisational structures. The adoption of an SEA system for Malaysian land use planning means that there are roles and responsibilities that should be shouldered by certain agencies. This section describes the roles and responsibilities in an SEA which is meant for land use plans, with SEA [Structure Plan] in the proposed national planning system.

The differences in the roles and responsibilities of agencies which are currently involved in EIA and agencies which are expected to be involved in the proposed plan SEA should sum up the new agenda. The proposed roles and responsibilities of the various agencies and organizations are summarised in Table 11.2.

The initiator

While the responsibility to carry out project EIA is with the project initiator, which could be an individual or organisation from the public or private sector, the responsibility to carry out SEA should be the authority responsible for the preparation of the relevant policies, plans and programmes. The Economic Planning Unit of the Prime Minister's Department for instance, who is responsible for the preparation of the National Five-Year Plans, is the initiator for SEA [National Plan], while the various sectoral ministries are the initiators for SEA [national sectoral policies].

In land use planning, it is proposed that there should be a hierarchy of plans, i.e. the National Spatial Plan, State Spatial Plan, Structure Plan and Local Plan at national, state, sub-regional and local levels respectively. This proposal is made to ensure that environmental impacts of policies, programmes and policies at all levels of planning and government are formally assessed, so that mitigating measures could be prepared in advance of project implementation, or even in advance of project initiation in some cases. The initiators for the respective land use plans are indicated in Table 11.2

The Assessor

The assessor in EIA is the individual who conducts or coordinates the environmental impact assessment. He may be the leader of a team and is responsible to the project initiator. The credibility of the assessor in project EIA is vetted by the DOE whose decision is based on the complexity of the development project.

The land use planning process, whether it is for national, state, or local authority level is more complex, as it is multi-sectoral in nature, and spatial in context. The assessment is of impacts of policies, programmes and proposals which look long-term [normally twenty years] in the future. The integration of SEA within the planning process means that assessors should be a group of responsible specialist personnel who are included within the planning team itself, under the coordination of the leader of the planning team. These personnel could either be from the government agencies [government departments or universities], or consultants from the private sector, depending on the availability of qualified personnel required for the assessment of the expected significant impacts. These could be from any of the disciplines associated with the physico-biological, economic, social and cultural environments.

Consultation and public participation

In Malaysian EIA, public involvement is allowed in the procedure through two different channels. The first channel is provided by the assessor who is normally required to obtain public opinion on the project. The second channel is provided by the Review Panel who invites a member of the public to sit in on the deliberations of the ad hoc Review Panel. At the same time, other members of the public may submit written comments to the Review Panel within a stipulated period after an EIA report has been put on public display. However public hearing procedures similar to those practised in other countries is not followed in EIA in Malaysia.

TABLE 11.2: ILLUSTRATION OF PROPOSED ROLES AND RESPONSIBILITIES IN EIA AND SEA [LAND USE PLAN]

ROLES	RESPONSIBLE AGENCIES	
	Project EIA	SEA [Land Use Plan]
Initiator	Public / Private individual or organisation.	FTCPD for NSP; STCPD for SSP; LPA for structure and local plans.
Assessor	Individual / Team responsible to the project initiator.	Planning teams responsible to the initiator.
Consultation & Public participation	The Assessor; Review Panel.	FTCPD for NSP; STCPD for SSP; LPA for structure and local plans.
Review Panel	Appointed by DOE which is the secretary to the Review Panel.	Appointed by FTCPD for NSP and SSP; Appointed by SPC for structure and local plans.
Approving Authority	NDPC for Federal government sponsored projects; SPA for state government projects; MOT for industrial projects; LPA for private sector projects.	NPCC for NSP and SPP; SPC for structure and local plans.
Responsible Agency	DOE	FTCPD

Note: NSP = National Spatial Plan NDPC = National Development Planning Council
SSP = State Spatial Plan NPCC = National Physical Planning Council
SPA = State Planning Authority SPC = State Planning Committee
MOT = Ministry of Trade LPA = Local Planning Authority
DOE = Department of Environment
FTCPD = Federal Department of Town and Country Planning Department.

In the proposed SEA [Land use plan], there is a provision for more formal and systematic opportunities for public consultation, representations and objections. This is possible through the elaborate public participation procedure already included in the development

plan process provided by Act 172. The same public participation procedure could also be adopted in the preparation of national and state spatial plans, with slight modifications.

Inter-government departmental consultation is provided either informally through discussions between the planning team and relevant personnel from various departments or agencies, or through the elaborate committee system which form the hierarchy of decision-making within the planning process, as examined in Chapter 8. Consultation with planning authorities of adjacent areas is also made mandatory by the development plan system which exists.

For structure plans, public opinion is first sought through surveys for the baseline information, which is mandatory. This step is consistent with the EIA process. The public could then make representations on SEA when making representations on the goal and objectives, and on the Report of Survey. This is consistent with 'scoping' in EIA. In the third stage, the public could object to the SEA results which are integrated within the Draft Structure Plan/SEA Report. These activities are made with the assumption that effective publicity is given to the public on the opportunities given to them to participate in these planning activities. These steps in the SEA [Structure Plan] process is illustrated in Fig. 11.2.

The adoption of a similar consultation and public participation procedure in national and state spatial plans, as well as local plans, would ensure that public participation is systematic and effective.

SEA Review Panel

In EIA, the Review Panel, which is made up of selected independent personnel or experts from various fields, is appointed by the DOE to review the Detailed Assessment reports, and to evaluate the environmental and development costs and benefits to the community as best as it can. It then makes recommendations, upon which approving authorities will decide whether or not to approve the projects with or without conditions. The secretariat to this panel is the DOE.

In SEA [Structure Plan], it is proposed that this SEA Review Panel, to be appointed by the SPC at the state level, is formed at the early stage of the planning process. In order for the SEA Review Panel to be familiar with the conditions and issues which are unique to every plan, it is proposed that the Panel members be formally involved in the formulation of the Terms of Reference [TOR] and provide comments on the Report of Survey.

The proposed arrangement is consistent with the integrated approach towards SEA. Planning being a cyclical process of decision-making, the role of the SEA Review Panel is to give independent advice to the SPC on the draft structure plan, and on any proposal made by

the planning team [which includes the EIA personnel]. The Panel should be familiar with all planning principles and issues which become the basis for the particular plan. Its members should, from the early stage of the planning process, be exposed to all aspects of planning, so that there is a common understanding of the opportunities and constraints which could be present. They in turn would be given the opportunity to advise the Steering Committee on environmental matters at the critical phases in the planning process, particularly in the formulation of the TOR, planning goal and objectives, alternative strategies, evaluation and selection of the preferred strategy, and on any mitigating measures that are necessary.

The above proposal is crucial in an SEA because of the multitude of issues that have to be considered. While the non-environmental personnel should appreciate the environmental implications of their proposals, the environmental personnel should also appreciate the complexity of the land use planning process. The main objective of this arrangement is towards a common appreciation of the added complexity of planning with SEA.

It is proposed that the SEA Review Panel should comprise members from the government and private sectors, with a good representation from each field of the physical environmental studies, as well as from the socio-economic field. A respectable proportion of "expert" local residents should be maintained in the Panel, to supplement the public input which would be obtained through the formal public participation activities.

The Approving Authority

The approving authority in a project EIA is the authority which decides how [or whether] a project should proceed. Table 11.2 indicates the hierarchy of approving authorities, depending on the level of projects that are involved.

In SEA [Land use plan], the approving authority is the authority which approves [with or without condition] the plan which is prepared. With the integration of SEA within the planning process, the approving authority should approve a plan which has integrated the social, economic, and physical components of the environment while achieving national, regional and local policies, strategies and programmes towards more sustainable development.

While Act 172 provides for the approval of structure plans by the State Planning Committee, and the approval of local plans by the local planning authority, it is proposed that both plans, because of the SEA component, should also be approved by the SPC prior to enforcement. It follows therefore that the Structure Plan/SEA report and the Local Plan/SEA report should be approved by the SPC, whose functions also include the promotion of the

conservation, use, and development of all lands in the State, and to advise the State Authority on these matters before the assent for the plans to be gazetted.

The approving authority for the proposed State Spatial Plan is the proposed National Physical Planning Council [NPPC]. The approving authority for the proposed National Spatial Plan is also the proposed National Physical Planning Council, of which the FTCPD is the Secretariat.

The Responsible Agency

The EQA [Amendment] 1985 makes it clear that the DOE is responsible for the enforcement of project EIA, while the SMP [1991-1995] stipulates that it is also a common responsibility for all agencies to ensure that future development efforts will emphasize the impact of development on the environment to ensure that environmental quality is sustained.

The Sixth Malaysia Plan does not give any direct responsibility for the environment, nor on land use plans, to the TCPD. Act 172 gives the responsibility of preparing land use development plans to local planning authorities, while there is no provision at all for land use or spatial planning at state or national level. However within the framework of management of environmental change, it is crucial that land use planning should play a big role in the achievement of sustainable development. As a tool which determines future land uses, and therefore future development and environmental change, land use planning is critical in determining sustainable utilisation of resources, preservation of the natural environment, and enhancing the quality of life in towns and countryside.

There is a need for an agency to be responsible for land use planning of the country as a whole, in order to ensure coordination, as well as consistency and conformity to national, state and local policies. This agency is to determine sustainable utilisation of resources, preservation of the natural environment, and enhancement of the quality of life.

At the state level, Act 172 has given the responsibility of promoting the conservation, use and development of all lands, and advising the State Authority on these matters, to the State Planning Committee. As the Secretary to this committee, the Director of STCPD is the principal adviser to the SPC on matters related to land use planning [town and country planning] and is responsible for carrying out the SPC's decisions and implementing its policies. On matters directly related to land use development plans, the SPC is responsible for the approval of structure plans, and with the enforcement of SEA in the local plan process, it is proposed that the SPC should also be responsible for the approval of local plans.

With the above scenario, it is logical that the STCPD is the responsible agency over land use planning and SEA [land use plans] in the state. It should be responsible for land use

planning and coordination as well as monitoring of development to ensure the achievement of sustainable development.

At the national level it is proposed that the FTCPD be responsible for national land use planning and coordination as well as monitoring of development. The director-general of the department should be appointed as the secretary to the proposed National Physical Planning Council. The director-general of town and country planning is then the principal adviser to the Federal Government on matters related to town and country planning, and is responsible for national land use planning and coordination as well as monitoring of development to ensure the achievement of sustainable development. With this responsibility it is appropriate and logical that the FTCPD should be the responsible agency for SEA [Land use plan] in Malaysia.

11.3.5 Methodological guidelines for Malaysian SEA [Structure Plan]

Need for a method

SEA links policy, planning and environmental assessment. There is a need for methodological guidelines for SEA, since it is a new phenomenon in the Malaysian planning scene. Characteristics of SEA differ from those of project EIA, and therefore it is logical that the method of undergoing the exercise should differ.

EIA is a complex multi-disciplinary exercise in environmental management. It includes the disciplines of ecology, biology, physics, biochemistry, agronomy, archaeology, anthropology, sociology, economics, political science, climatology, medicine, geography, etc. It involves the fields of business management, administration, politics, jurisprudence, etc. When applied to land use planning in the form of SEA, the exercise becomes more complex, because the area for assessment is very much wider [regional or sub-regional] than that of project EIA, and environmental components and attributes are much more.

SEA is expected to provide answers needed by policy makers, planners, engineers, affected groups and government agencies to help them understand planning implications and to take the necessary decisions. However it is only effective if it is related in form and timing to the decision-making process, in order that optimum strategies for averting or reducing adverse consequences can be formulated and evaluated. It is only efficient if it maximizes the available expertise, acknowledges the occasional need for technical assistance, and utilizes an available budget. To meet all these requirements, it is necessary that a guiding method be made available for all parties concerned.

Beside physical and economic diversities between regions, the Malaysian environment is made more complex by the great diversities in its socio-cultural environment.

The achievement of the national goal of national unity needs a careful assessment of all the socio-economic-political policies and proposals in the land use planning process. The SEA method to be adopted in Malaysia has to be unique to its diverse environment, while focussing on the key themes in environmental planning, i.e. local development strategies, quality of life, promoting aesthetic quality, and developing implications of widely shared values about environmental conservation and ecological balance.

The SEA method [s] to be developed for Malaysian land use planning should be in the context of its decision-making environment, i.e. its political, social, economic and administrative framework. International experiences have to be examined in terms of their applicability to Malaysia, particularly within the following context:

1. The planning system;
2. The political, administrative, social and economic system;
3. The level of expertise and exposure of land use planners and other professionals [including environmental scientists] to SEA methods and techniques;
4. The availability and ease of retrieval of data from relevant agencies;
5. The availability and sophistication of environmental standards;
6. The financial capabilities of planning authorities;
7. The time factor; and
8. The level and degree of public participation and consultation that could be allowed within the system.

General guidelines

To develop and suggest the appropriate assessment methods and techniques for every step of the planning process is beyond the scope and means of this research. However, several examples of methods and techniques, and general guidelines for the preparation of a structure plan in Malaysia have been identified and outlined in Table 11.3.

It is proposed that the FTCPD, the responsible agency for SEA [Land Use Plans] prepare and publish a Manual or Handbook for the planning and assessment procedure [including methods and techniques] for all land use plans, to be used by land use planners and other professionals, as well as references by planning authorities and decision-makers.

TABLE 11.3: GENERAL GUIDELINES ON METHODS AND TECHNIQUES FOR SEA [STRUCTURE PLAN] IN MALAYSIA

TASKS BY STAGES	EXAMPLES OF METHODS AND TECHNIQUES	GENERAL GUIDELINES FOR STRUCTURE PLAN
STAGE 1: Formulation of Goals and Objectives.		
Problems identification	• Checklists	- A general simple checklist can be prepared by FTCPD, based on its vast experience in land use planning, in consultation with STCPD and several local authorities. The checklist will be modified, and updated during plan preparation.
Identification of key issues & preparation of TOR	• Checklists	- Can be based on or modified from a general checklist by FTCPD, but with more local input.
		- Sieving through minutes of meetings is a rewarding source.
	• Consultation	- Consultation with local level agencies and general public representations are important.
Approval of TOR	• Administrative arrangements	- STCPD, the responsible agency at state level, forwards its comments to FTCPD and brings the matter to SPC.
	• Consultation	- SPC approves the TOR after reviewing comments from the independent Review Panel which is appointed by FTCPD.
Formulation of Goals and Objectives	• Checklists	- Can be based on or modified from a general checklist by FTCPD, but with more local input.
	• Consultation	- More attention is paid to local problems, values and aspirations
		- Consultation with local agencies;
	• Public participation	- Formal invitation for public participation through notice in newspapers.
STAGE 2: Survey, Prediction & Analysis		
Data collection, analysis and forecasts	• Checklists	- Modification of the basic checklist by FTCPD
	• Land use and topographical surveys, overlays.	- Use of aerial photographs, topographical maps and use of overlays techniques to determine activities suitability.

TABLE 11.3: [CONT.]

TASKS BY STAGES	EXAMPLES OF METHODS AND TECHNIQUES	GENERAL GUIDELINES FOR STRUCTURE PLAN
	• Socio-economic surveys	- Updating of national census data on local socio-economic conditions. Need for strong cooperation from the Statistics Department, and efficient Data Bank at the local authority.
	• Field samplings of environmental data	- May be necessary to identify gaps in environmental data.
	• Population and socio-economic forecasting	- Population and socio-economic forecasting techniques applied to the planning area. Models of techniques to be compiled by FTCPD in the form of a Manual or Handbook.
	• Checklists and matrices	- For identification use, resource and waste coefficient analysis and impact on environmental quality. - Predict physical resource use and waste generation levels associated with forecast economic and social changes. - Environmental agency consultation, screening procedures, landscape assessment techniques.
	• Use of data retrieval systems and GIS	- Recommend that planning authorities develop efficient data collection and retrieval systems which are related to the use of GIS.
	• Management and coordination technique	- Importance of management of multi-disciplinary team and multitude of data to be collected, analysed and forecasted, so that there is no duplication and wastage of resources and no time delay.
	• Consultation	- Based on checklist of agencies related to socio-economic and environmental data, policies and strategies.
Development of planning criteria and assumptions	• Intuitive and Delphi techniques and brainstorming	- Intuitive techniques and brainstorming are for basic identification. In view of time factor, modified versions of Delphi technique should be attempted.
	• çonsultation	- Consultation with relevant agencies, particularly at local level, is useful for final identification.

TABLE 11.3: [CONT.]

TASKS BY STAGES	EXAMPLES OF METHODS AND TECHNIQUES	GENERAL GUIDELINES FOR STRUCTURE PLAN
Analysis of management situation	• Review of procedures and guidelines and records	- Review and analysis of the organizational structure and capability of the local authority and its relationships with other agencies in terms of implementation of policies and proposals to form the framework for planning proposals.
		- Review of management resources [manpower and finance] to determine potentials and constraints, so that only realistic proposals are developed.
Preparation of Report of Survey	• Communication technique	- The Report of Survey must be presented in simple terms for the understanding of all levels of the population in the planning area. The content should include problems and issues related to socio-economic and physical environments, as well as likely impacts of forecasts on resources utilization.
	• Consultation	- Formal comments from the Review Panel and other agencies are invited.
	• Public Participation	- The public is encouraged to provide feedback on existing problems and issues, as well as give opinions on likely impacts of future developments.
STAGE 3: Generation and Assessment of Alternative Plans		
Formulation of alternative strategies	• Intuitive technique, checklists, overlays, Threshold Analysis, Land Suitability Analysis	- Choice of method/technique depends on availability of resources. - 'Scientific' discoveries are checked against goals and objectives and planning criteria which could be in the form of a checklist. - Each alternative is described in terms of general features, expected general physical changes, changes in resource use and waste generation associated with its implementation.
	• Consultation and public participation	- Informal consultation with other agencies, and public participation is obtained through representations made on the Report of Survey. If necessary, sample surveys can be carried out to find the social response to changes.

TABLE 11.3: [CONT.]

TASKS BY STAGES	EXAMPLES OF METHODS AND TECHNIQUES	GENERAL GUIDELINES FOR STRUCTURE PLAN
'Testing' and Selection of Alternative Strategies for impact assessments	• checklists or matrices	- The main aim is to select and reduce the number of alternatives to be developed further. These alternatives must satisfy all goals and objectives and planning criteria, besides being 'environmentally-friendly' [based on initial and general predictions].
Assessment of environmental impacts of Selected Alternative Strategies	• Checklist, resource and waste coefficient analysis, resource depletion, diffusion and damage analysis, landscape assessment technique, social surveys, scaling and weighting systems, overlay methods, GIS.	- Choice of method/technique or combination of method/technique depends on the availability of resources. - Determine environmental evaluation criteria. - Assess physical changes, changes in resource use and waste generation associated with its implementation. - Predict magnitude of environmental impacts associated with implementation on air, water and land [including mineral resources] and living receptors within the environment. - Assess the importance of impacts and investigate response of affected parties
Selection of Preferred Alternative Strategy and impact assessment exercise on proposed policies.	• Multi-criteria evaluation method, checklist, matrices, Policy Impact Matrix, consultation.	- Choice of method or combination of methods depend on availability of resources. - Consultation with relevant agencies to determine 'practicality' of preferred strategy & policies for implementation.
Preparation of Draft Structure Plan/SEA	• Communication Techniques • Consultation	- The report must be presented in simple terms for the understanding of all levels of population in the planning area. The report is to be structured so that it can be used by the public to make objections, by other agencies to make comments, and by decision-makers to make decisions. - The contents should include descriptions of the alternatives and their expected impacts, and reasons for the selection of the preferred alternative. - The unavoidable impacts of policies and proposals must be identified against respective mitigation measures.

TABLE 11.3: [CONT.]

TASKS BY STAGES	EXAMPLES OF METHODS AND TECHNIQUES	GENERAL GUIDELINES FOR STRUCTURE PLAN
Decision on Structure Plan/SEA Report by SPC	• Consultation and public participation	- SPC decides on the plan after reviewing comments by FTCPD, other agencies and the Review Panel, and any objections by the public on the Draft Report which has been made available for public inspection.
STAGE 4: Implementation, Monitoring and Review	• Administrative and Environmental monitoring	- There must be close liaison between the local authority and S T C P D [Secretariat to SPC] for SPC's decision and assent by the State Authority for enforcement. - The local authority is responsible to implement, regularly monitor the impacts, and review the plan every five years or whenever directed by SPC, and performs all functions provided by Section 6 of Act 172. - STCPD is responsible to monitor the local authority's activities in relation to the implementation of the plan, and facilitates the functions of SPC as required by Section 4 of Act 172. - The local planning authority, with assistance and coordination from STCPD is to conduct a 'green audit' and regularly monitor it for sustainable development planning.

11.4 CONCLUSIONS

This chapter has summed up the justifications for and described an ideal Malaysian national planning system which can accommodate within it a hierarchy of different types of SEA which perform the four functions of: promoting the management of environmental change; promoting planning for sustainable development; promoting well-informed decision-making in the planning process; and overcoming shortcomings of project EIA. The chapter has described how one form of SEA which is termed as 'SEA [Structure Plan]', is integrated into the structure plan process under the existing land use planning legislation. Adopting the flexible approach, this process can be adapted for other policies, plans and programmes in the national planning system.

Having approached the proposal for SEA for land use planning in a comprehensive manner, the chapter has justified the need for developing a new national planning system for Malaysia, since the existing system cannot provide the ideal framework for a systematic and hierarchical functioning of land use planning and SEA. To accommodate the principles of SEA, the proposed national planning system has been developed based on the adaptation of the integrated planning and management system, and the strategic planning framework for national social and economic policies. The resultant system complies with the justified underlying philosophy, criteria and assumptions, which have been developed from the examination of concepts of sustainable development, land use planning and environmental impact assessment, and the examination of current practice and shortcomings of these concepts in Malaysia. The key issues which have been identified form the legislative, institutional, procedural and methodological justifications and framework for integrating SEA in land use planning towards sustainable development.

This chapter has introduced new types of land use plans at national and state levels, and new roles and responsibilities for various agencies in land use planning. However due to research constraints, this thesis does not include the scope and structure of these new plans, and the organizational structure of all organizations which need to be strengthened in order to perform the new roles and responsibilities. Suffice to say that the proposals are justified for the effective operation of the new planning approach which accommodates SEA.

As stated in the introduction of this chapter, the proposals are made while having in mind the shortcomings in the current planning and environmental assessment systems. The proposals have also been made with the assumption that there is full support of legislative and institutional arrangements as well as resources . If these are not strengthened to face the new challenges, the operation of the new systems would face a lot of hurdles.

To be realistic, the proposals can only be enforced in a phased incremental approach, based on the restructuring of institutions and availability of resources. These institutions and resources have been examined in a general manner in Part 2, but a more rigorous examination of the resources will have to be made, to identify immediate actions that have to be taken in order to operationalise the proposals in this chapter. This rigorous examination is beyond the scope of this research. However a brief review of these resources is made in the next chapter, to justify the proposals for immediate actions which are outlined in Chapter 13.

Chapter 12

Review of existing resources

12.1 INTRODUCTION

Chapter 4 includes the recommendation that effective institutional arrangements are necessary to facilitate EIA in performing its role as a planning and decision-making tool for sustainable development. The areas to be addressed are: policy, legislation, machinery, personnel, and information. The same principle is adopted for SEA. However before any recommendation is made, a review of the resources under these institutional arrangements is necessary. This forms the scope of this chapter.

The review of each area of institutional arrangements in this chapter is made with reference to the requirements for an effective operation of a land use planning system with SEA, as proposed in Chapter 11. No recommendations are made here; all the proposals for operation are laid out in Chapter 13.

12.2 POLICY

In terms of national policies to facilitate SEA in its role as a planning and decision-making tool for sustainable development, the first criteria to be met is that twin goals of development and environmental/natural resources conservation must form part of national policies. In Malaysia this must be examined in the context of the National Development Policy [NDP], the Second Outline Perspective Plan 1991-2000 [OPP2] and the Sixth Malaysia Plan 1991-1995 [SMP], since the latter two are policy documents towards the achievement of NDP.

By looking only at the policy statement, it would seem that NDP does not comply with the above requirement. While continuing the basic strategies of eradication of poverty and restructuring of society, all the new dimensions of NDP are towards economic goals; eradication of hardcore poverty, reducing relative poverty, development of Bumiputera Commercial and Industrial Community [BCIC], more reliance on private sector involvement in economic growth, and focus on human resource development as a fundamental requirement for achieving objectives of growth and distribution. However, among the development thrusts for the 1990s, one of the eight critical aspects encompassed by NDP is "ensuring that in the pursuit of economic development, adequate attention will be given to the protection of the

environment and ecology so as to maintain the long-term sustainability of the country's development." [OPP2 1991-2000, p.5]. In addition, one of the considerations for NDP strategy is "prudent management of natural resources and the ecology as well as the preservation of natural beauty and clean environment ... to ensure sustainable development for the present and future generations." [OPP2 1991-2000, p.6].

Malaysia's macro-economic strategies too consider the fact that "...with natural resources becoming more scarce, and with growing concerns on environmental degradation, there is a need to ensure the efficient utilization of resources for sustainable development." [SMP 1991-1995, p.40]. These strategies are different in statement from the macro-economic framework of OPP1 1971-1990: "The prospects for accelerated growth ... have its origin from the utilization of the nation's large natural resource endowment through expansion in agricultural production as well as raw material-based industrial development." [OPP2 1991-2000, p. 33].

Sectoral policies and strategies too reflect the twin goals of development and environmental/natural resources conservation. The agricultural sector for instance is constrained by the scarcity of suitable land, and is developing policies to preserve the ecological balance and promote sustainable development, while there is greater emphasis on forest conservation to maintain environmental stability and ecological balance. In transport and communications, consideration will be given to environmental protection through the reduction of negative impact on the environment from infrastructure development, and to reduce urban congestion and thereby travel cost and time as well as pollution problems. In tourism, the main thrust is to preserve and enhance existing natural and cultural assets, without excessive modification and over-commercialization, giving emphasis on conservation to reduce the negative effects of environmental damage.

To provide the framework for national development, "the government is formulating the National Conservation Strategy to provide the comprehensive resource management and utilization" [SMP 1991-1995, p. 398]. To sum up the prospects for 1991-1995, "In the light of rapid industrialization, high population growth, increasing urbanization, growing scarcity of land and other resources, greater emphasis will be given to sustainable development. The increased tempo of development calls for greater efforts at maintaining environmental cleanliness and ecological balance through more effective environmental management." [SMP 1991-1995 p. 397].

The second criteria under policy area is that the national policy must be [i] *achievable* i.e. realistic goals through sound environmental management; [ii] *specific* i.e. priority areas are

clearly specified; [iii] *flexible* i.e. open to suggestion and comments at all times; and [iv] *responsive* i.e. to social and cultural traditions of the country.

To make a valid statement on whether or not the national policy is achievable needs a policy analysis which is beyond the means of this research. What is done here is only to make a comparison between one of the OPP1 targets and what has been achieved, and a similar target area in the OPP2, and assessing whether or not the new target is reasonable. It is noted that the assessment is only based on personal intuitive judgement. Since the main thrust of NEP [1970-1990] and NDP [1990-2000] is eradication of poverty, a simple analysis of the targets for and achievements in terms of poverty rates of incidence are illustrated in Table 12.1.

The target for 1990 was towards a reduction in the poverty rates of incidence by 57.3%, 60.8% and 66.1% for urban areas, rural areas and the whole of Peninsular Malaysia respectively. What was achieved in 1990 was a reduction of 65.7%, 67.1% and 69.6% in the poverty incidence rate from 1970, for the respective areas. This can be considered as a remarkable achievement of the NEP policy. The NDP targets for 2000 show nearly similar target reductions by 58.9%, 58.5% and 64.6% for urban, rural and total area respectively. Although the 1990 target was for a 20-year period, while the 2000 target is for a 10-year period, without undergoing a scientific policy analysis, the targets for 2000 seems to be a modest one and therefore can be considered as achievable within a reasonable limit, considering the great improvement in the economic base that has taken place in twenty years since 1970. However, income gaps and economic imbalances are still wide. In 1990, the bottom 40% of the households earned RM421 per month while the top 20% earned RM2,924 per month. Inter-ethnic income disparity is still high in certain sectors and occupations [OPP2 1991-2000].

TABLE 12.1: RATES OF POVERTY [%] INCIDENCE IN PENINSULAR MALAYSIA, 1970-2000

		TARGET 1990		ACHIEVED 1990		TARGET 2000	
AREA	1970	Incidence Rate	Reduction 1970-1990 by %	Incidence Rate	Reduction 1970-1990 by %	Incidence Rate	Reduction 1990-2000 by %
Urban	21.3	09.1	57.3	07.3	65.7	3.0	58.9
Rural	58.7	23.0	60.8	19.3	67.1	8.0	58.5
Total	49.3	16.7	66.1	15.0	69.6	5.3	64.6

Adapted from basic data from OPP2 1991-2000.

The figures in Table 12.1, and the analysis based on them, are only for one aspect of the national policies, albeit a very important aspect. However, since all other strategies are related to the main thrusts of poverty eradication and restructuring of society, it is expected that other national policies and strategies are similarly reasonable in their targets, and are therefore achievable within a reasonable limit.

OPP2 and SMP are relatively elaborate in terms of macro-economic and sectoral strategies, but they are not specific in spatial or environmental terms. Priority areas are not clearly specified by location. This could be due to the lack of spatial or physical planning input in the preparation of these policy documents. At the most, reference to regional development by states are made, but no specific area, other than the Klang valley and several major towns are mentioned. The fact that there is a lack of spatial planning input is reflected in the statement that the identification of potential areas for human settlements will be made through the National Spatial Plan and structure plans [OPP2 1991-2000].

There is no national environmental policy as such [Bakar 1990]. Beside making references to the achievement of 'sustainability', 'sustainable growth', 'sustained economic growth', 'sustainable development', 'resource conservation', 'environmental preservation' and the like, there is no national policy or statement to date on an approach for, or operational perspective for achieving sustainable development at the national level, much less at the local level. However indications are clear that the 'sustainability limit' version to sustainable development has been adopted. In view of this, the lack of information on natural capital stock and more specific environmental data in the National Plans is a major shortcoming.

The national policies are not flexible in terms of being open to suggestions and comments *at all times*. However the formulation of these policies have undergone stages of consultation through the committee system which includes representatives from the private sector and all political parties. These consultation activities will commence again during the review of the policies at the end of two years of the 5-Year Plan, and at the end of 5 years of the 10-year Plan. As to the responsiveness of the policies to social and cultural traditions of the country, the policies are largely based on 'technical' analysis and professional intuition or judgement. Expected benefits and intended beneficiaries of development projects are not clearly defined and agreed upon from the start by the general public, since there is a limited public participation exercise during plan preparation.

From the above analysis of NDP, OPP2 and SMP, it can be concluded that Malaysian national policies provide a reasonably good socio-economic policy framework to facilitate SEA, but there are shortcomings in terms of spatial and environmental guidelines for other policies and plans in the planning and implementation hierarchy in the country. These

shortcomings make it difficult to achieve an effective functioning of the proposed national planning system, since national plans, policies and programmes do not provide effective frameworks that can be translated into macro-scale resource management plans at Level 2 of the planning system [Fig. 11.1 in Chapter 11].

12.3 LEGISLATION

By the absence of SEA in the current Malaysian planning system, it is obvious that the existing legislation does not indicate when SEA is necessary, what SEA must contain, empowerment of any body to review SEA, and legal/administrative sanctions if the law is not complied with, all of which are ideally recommended. This section therefore only reviews the Town and Country Planning Act 1976 [Act 172] to highlight some shortcomings, or the lack of certain provisions, toward the operation of SEA. References are also made to relevant proposed amendments to Act 172, as put forward by FTCPD to the Attorney General's Office in 1993 [FTCPD: Minutes of Meetings of the Committee for the Review of The Town and Country Planning Act 1976 from 1990 to 1993]. For ease of reference, the most significant Sections are summarised in Table 12.2.

The introductory paragraph to the legislation states that Act 172 is an "Act for the *proper control and regulation* of town and country planning *in local authority areas*..." [Act 172, p.7 - italics are made here for emphasis]. The first significant point here is the undertone of a regulatory nature and passive characteristic of land use planning, despite the fact that it includes provisions for forward planning in the form of structure and local plans. The second significant point is the implied restrictive jurisdiction of the Act, by the application of the Act in 'local authority areas' only, since Section 5 (1) provides that the local authority is the local planning authority for its area.

By direct interpretation, the introduction to the Act reflects a limited jurisdiction of land use planning, when considering the fact that not all areas are covered by local authorities [formed under the Local Government Act 1976 - Act 171], and the problems caused by their sporadic pattern and varying sizes which makes strategic planning difficult, as examined in Chapter 7. However under Section 5(2) and 5(3) of the Act, areas outside local authorities can also be declared as local planning authorities, thus enabling the preparation of structure plans for several contiguous local authorities and areas between them, as in the example of the Johor Barat Structure Plan [preparation of 14 structure plans for 14 local planning authorities in one exercise - nine local authorities were formed under Act 171, and five were formed under Act 172]. This cumbersome approach to preparing structure plans, which is only based on administrative arrangement, is hoped to be overcome if the Act is amended to include Section 8(1A), which is the provision for "joint" structure plans.

TABLE 12.2: SIGNIFICANT SECTIONS [WITH REFERENCE TO ROLES AND RESPONSIBILITIES IN LAND USE PLANNING AND STRUCTURE PLANS] IN ACT 172

Sections	Significant provisions
Introduction	• Enforcement of the Act in local authority areas only.
Section 2	• No definition of "environment" or "measures for the improvement of the physical environment" which is mentioned in Section 8(3)(a).
Section 3	• State Authority is responsible for the general policy in respect of planning and development "within the area of every local authority in the State"
Section 4(3)	• Functions of the State Planning Committee [SPC] include the promotion of the conservation, use and development of all lands in the state, advising the State Authority on the related matters, and facilitating data information system and streamlining planning methodologies.
Section 4(8)	• The Director of STCPD, as the Secretary to SPC, is the principal adviser to SPC, and responsible to carry out decisions and implement policies of SPC.
Section 5(1)	• Every local authority [under Local Government Act 1976] is the local planning authority.
Section 5(2)&(3)	• Declaration of any area as local planning authority, and of any person or persons to be the local planning authority of that area.
Section 5(3A)	• *The local planning authority under Section 5(3) will be equipped with necessary supporting services to carry out its duties.*
Section 6(1)	• Functions of local planning authorities include the regulation, control and planning of its area; data information system and any function assigned by the State Authority and SPC.
Section 7(3)	• Matters to be examined [surveyed] and kept under review include: principal physical, economic, environmental and social characteristics; matters that may be expected to affect any matters mentioned before; and any changes already projected and the effect that they are likely to have on the development or planning of the development of that area.
Section 8(1A)	• *There is a provision for "joint" structure plans for two or more local planning authorities.*
Section 8(3)	• The structure plan contains the policy and general proposals in respect of the development and use of land in that area, including measures for the improvement of the physical environment, improvement of communications and the management of traffic.
Section 8(4)	• The structure plan must have regard to current policies in respect of the social and economic planning and development and environmental protection of the State and the nation.
Section 9(1)	• Provision for public representations on the Report of Survey.
Section (2)	• Provision for public objections on the Draft Structure Plan.

Note: Sections in italics are the proposed amendments forwarded by FTCPD to the Attorney-General's Office in 1993.

The implementation of plans in local planning authorities which are formed under Act 172 are expected to be difficult and ineffective, since they do not have the appropriate resources as planning authorities. This is hoped to be overcome by the proposed Section 5(3A), which is the provision of necessary supporting services by the State Authority to these local planning authorities to carry out their duties. However it is difficult, at this point in time, to foresee how these local authorities can have the same resources as local authorities which are formed under the Local Government Act 1976. It is difficult to see a smooth implementation of plans, even with these proposed arrangements. The recommendation in Chapter 7 for a review of the local government system, particularly of their boundaries, is still valid.

Other than preparing a joint structure plan which covers the whole state, there is no provision for a state-wide physical or spatial plan, or even for state-wide planning guidance. This limitation means that it is not possible to prepare a statutory State Spatial Plan under the existing legislation. The assigned role and responsibility of the Director of TCPD [Section 4(8)] could include the preparation of state planning guidance, but without the supporting machinery, this would be very difficult to achieve. However the assigned functions of the STCPD still provide the potential to include as its one of the functions, the preparation and implementation of a State Spatial Plan, and for it to be the Responsible Agency for SEA at state level.

There is even less scope for the provision of a National Spatial Plan under the existing legislation. Other than the provision that structure plans must have regard to state and national policies in respect of social and economic planning and development, there is no mention at all of any role of the FTCPD or of national land use or physical or spatial plan. The FTCPD has been instrumental in the preparation of all structure plans so far, despite the fact that their role is not included in the planning legislation. This shortcoming also does not provide the authority to legally enforce the FTCPD as a Responsible Agency for SEA at Federal level, under the existing legislation. This is a limitation of the Act, considering the fact that town and country planning [except in the Federal Territory], is in the concurrent list of activities in the Federal Constitution. The other activities in the concurrent list [directly related to land use planning] include:

Protection of wild animals and wild birds;

National parks;

Animal husbandry;

Public health, sanitation and prevention of diseases;

Drainage and irrigation;

Rehabilitation of mining land and land which has suffered soil erosion;

Culture and sports; and

Housing and provisions for housing accommodation.

As far as the operation of the structure plan process with SEA, as proposed in Fig. 11.2, the Act does not provide any limitation on this. The identification of matters to be examined and kept under review [Section 7(3)] and the contents of a structure plan [Section 8(3) and 8(4)] are flexible enough to accommodate new elements in the plan. Furthermore, the fact that there is no definition of "environment" means a flexibility that can be taken advantage of.

The First Schedule [Rule 3(1)]: i.e. on 'Additional Matters to be Examined and Kept Under Review', of the *Town and Country Planning Act 1976 Development Plans [Structure and Local Plans Rules] 1985* is also non-restrictive on the definition of environment. The Second Schedule Part 1 [Rule 8(1)] i.e. on 'Matters to Which The Policy Formulated in A Draft Structure Plan Written Statement is Required to Relate', includes "Environment including conservation, preservation of townscape and landscape" beside other conventional planning topics such as housing, agriculture and transportation. The Second Schedule Part II [Rule 9] i.e. on 'Matters Required to be contained in a Draft Structure Plan Written Statement', includes "Any changes already projected, or likely to occur, which may materially affect matters dealt with in the plan, and the effect those changes are likely to have." This provides the scope for the No-Action alternative in planning with SEA. However, the rule does not require for any formulation and evaluation of alternatives, which is the basic principle in planning with SEA.

As examined in Chapter 8, formal public participation is made in two stages: the first stage is for public representation on the Report of Survey, and the second stage is for public objections to the Draft Structure Plan. The proposed process in Fig. 11.2 recommends two more stages of formal public participation; one during the formulation of goals and objectives, and the other during the assessment of alternatives. Although it is more effective if all four stages are included in the Act, the inclusion of the proposed two stages which are only based on a directive from SPC is still possible, until the Act is reviewed to include two more mandatory stages for public participation.

The above shortcomings mean that it is not possible to legally operationalise in total the proposals in Chapter 11. However a phased implementation through administrative means is possible.

12.4 MACHINERY

The proposed Malaysian national planning system with SEA in Fig. 11.1 illustrates the requirement for integration between socio-economic planning and land use planning, and a hierarchical link between national, regional and local level planning and management of resources. Theoretically in this system, there is no necessity for any more categorisation of

'agencies responsible for socio-economic planning' or 'agencies responsible for land use or physical planning', since all agencies are responsible for all policies, plans and programmes. However, that is not possible within the system of organizational administration. Therefore there would still be agencies which fall into one category or the other, and the requirement is for strong integration in the planning and management process which involves these agencies.

Chapter 7 describes the strong vertical link between agencies at federal, state and local levels in both socio-economic planning and land use planning, but a very weak horizontal link between them, thus indicating a weak link between socio-economic planning and land use planning. To propose an organizational system which provides links between all agencies involved in national planning is beyond the means of this research. However this thesis takes the stand that one of the ways of strengthening links and integration between these agencies is by strengthening the machinery within which land use planning operates, so that this machinery will act as a catalyst to promote the overall link and integration. For these reasons, this section only examines the machinery for land use planning.

Section 11.3.4 identifies the FTCPD as the responsible agency for SEA [Land Use Plans] at federal level, and the STCPD at the state level, while local authorities are SEA initiators for land use plans. The DOE remains as the Designated Environmental Authority in the country. This section now reviews the capabilities of the FTCPD, STCPD and the local authorities to perform these responsibilities, in the context of their organizational activities. Their manpower capability is examined in section 12.5.

Federal Town and Country Planning Department [FTCPD]

The FTCPD is under the Ministry of Housing and Local Government [MHLG]. Fig. 7.2 shows that in the context of Malaysian national development planning system, the MHLG only has a special formal relationship with the Economic Planning Unit [EPU] of the Prime Minister's Department, which is responsible for the preparation of the five-year national socio-economic plans, rather than having a formal planning authority. It follows therefore that the role of the FTCPD in national development plans is not that of a formal planning authority, but in terms of providing input to the EPU on matters which are related to spatial planning and urbanisation.

The main role of the FTCPD is to advise the Minister of the MHLG on town and country planning matters in Peninsular Malaysia. The Minister is responsible to Parliament on national urban and rural planning strategies. The functions of the FTCPD is reflected in its aim and objectives which are summarised as follows:

AIM:

To ensure a living environment which is healthy, safe, peaceful, and aesthetic, for a developed and disciplined Malaysian community.

OBJECTIVES:

To formulate a planning system which strengthens the physical, social, economic and environmental systems in urban and rural areas;

To assist local authorities in the provision of urban services which meet all social and economic needs;

To ensure housing developments which meet all social needs; and

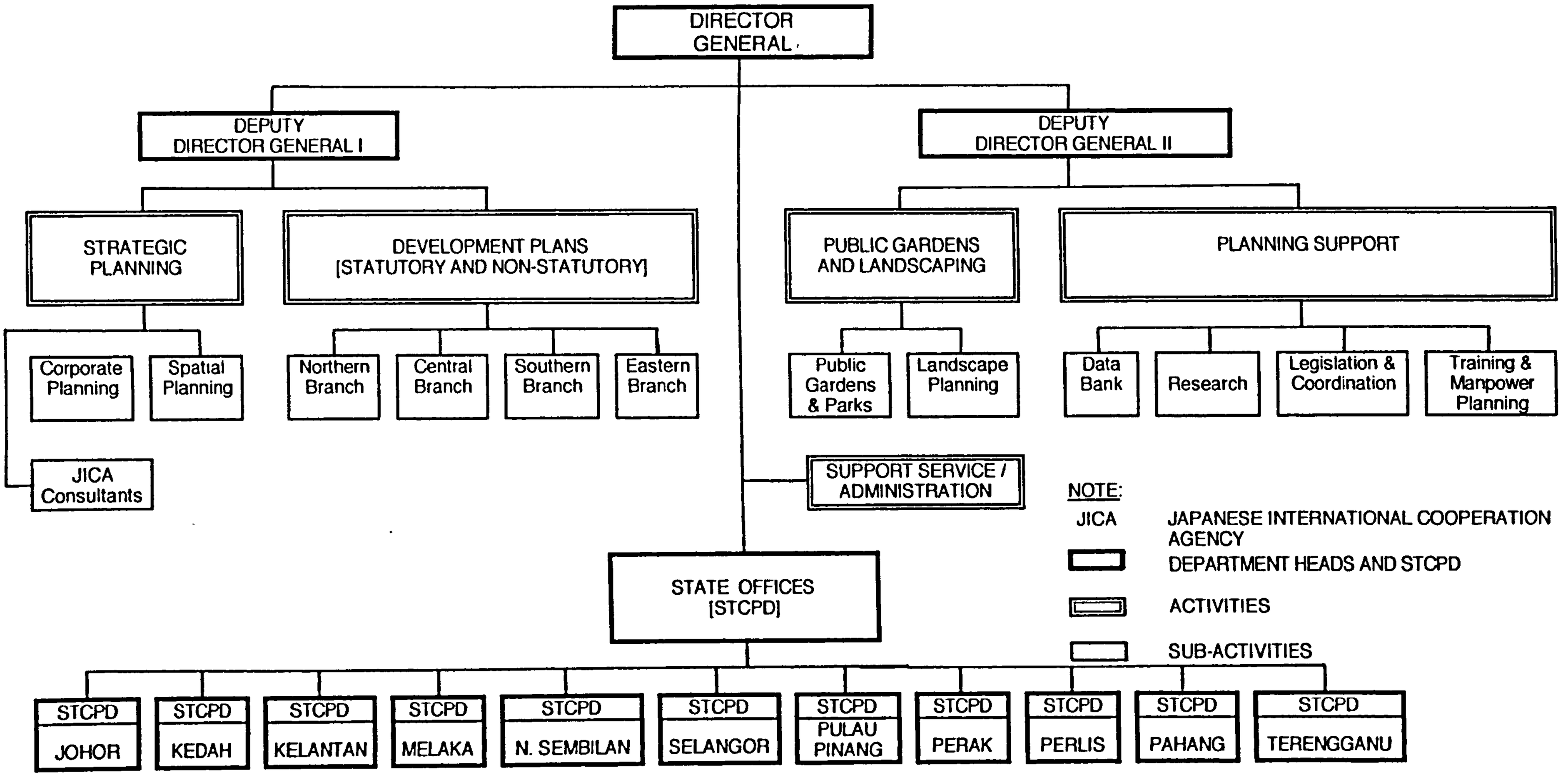
To ensure developments which accommodate preventive measures from hazards such as fire and pollution.

To achieve the above aim and objectives, the FTCPD is organized with one central 'nerve' i.e. the headquarters in Kuala Lumpur, and four branches in the Northern, Central, Southern and Eastern Regions. Advice to the state governments and local authorities are disseminated through the STCPDs which are located in every state in Peninsular Malaysia. The organization structure of the FTCPD, and functions and activities of the divisions and units in the department are illustrated in Fig. 12.1 and outlined in Table 12.3 respectively.

The organization structure and functions and activities of the department already provide the avenues for developing and implementing a form of planning which accommodates current concern for sustainable development, as proposed in this thesis. The Research Unit of the Planning Support Division particularly provides the machinery to carry out further research on the proposals; the Data Bank Unit and the Legislation and Coordination Unit can develop the information and legal frameworks for the new system; and the Training and Manpower Planning Unit can develop a programme for acquiring the necessary personnel. The Development Plans Division, which at the moment manage and prepares all land use development plans for local authorities, provide the avenue for putting the proposal into practice.

The Strategic Planning Division can be given the most critical role of promoting the integrated planning and SEA concept at all levels and sectors of planning and management of resources, particularly the very important task of convincing non-technical policy and decision-makers on the importance of adopting an integrated planning system, and the importance of adopting a formal system of environmental impact assessment of all forms of policies, plans and programmes in the form of SEA. Working together with the STCPDs, the Division can convince the state governments and local authorities on the merits of the proposed system. These roles are crucial because, as concluded in Chapters 8 and 9 in the discussion on land use planning and the experiences in the development of EIA in Malaysia respectively, there is

FIG. 12.1: ORGANISATION STRUCTURE OF FEDERAL DEPARTMENT OF TOWN AND COUNTRY PLANNING, PENINSULAR MALAYSIA



Source: FTCPD 1993.

TABLE 12.3: PLANNING FUNCTIONS AND ACTIVITIES OF THE FEDERAL DEPARTMENT OF TOWN AND COUNTRY PLANNING, PENINSULAR MALAYSIA

TECHNICAL DIVISIONS/UNITS	FUNCTIONS AND ACTIVITIES
STRATEGIC PLANNING DIVISION	Strengthens strategic planning and management and provides input in the formulation of policies, rules, guidelines and "modus operandi" of town and country planning and planning studies.
• Corporate Planning Unit	Strategic planning, specialist resource input into planning studies; and developments coordination..
• Spatial Planning Unit	Prepares the base for National Physical Plan; monitors progress statutory Development Plans; supervises Land Readjustment Study; and prepares TOR and guidelines on special planning studies.
DEVELOPMENT PLANS DIVISION	Assists local planning authorities to prepare statutory and non-statutory Development Plans through the Northern, Central, Southern and Eastern Branches.
• Structure Plan Unit	Involved in the complete planning process.
• Local Plan Unit	Involved in the complete planning process.
• District Devt.Plan Unit	Assists District Offices in the preparation of these non-statutory plans.
• Rural Planning Unit	Prepares plans for Rural Growth Centres and Resettlement Plans for Orang Asli aboriginals.
PLANNING SUPPORT DIVISION	Provides planning resources for all town and country planning activities, and expertise and professionalism in town and country planning.
• Data Bank Unit	Establishes a data bank for internal use and by other departments .
• Research Unit	Research for all land use activities, and the preparation of seminar papers for discussions and feedbacks on important planning matters.
• Legislation and Coordination Unit	Ensures uniform adoption and implementation of Act 172; provides guidelines on the Act for public dissemination; reviews the Act, and comments and advices on matters related to planning legislation.
• Training and Manpower Planning Unit	Supervises and coordinates programmes to promote skill, expertise and professionalism in the planning service,.
PUBLIC GARDENS AND LANDSCAPING	Coordinates and supervises the planning and management of public gardens and parks, and undertakes landscape planning of public areas/ spaces.
• Public Gardens Coordination and Supervision Unit	Landscape planning, coordination and supervision of public gardens and parks, and provision of expert advice to other departments.
• Landscape Planning Unit	Planning, design and supervising the development of public gardens and parks, and providing expert advice on landscape planning to other government departments.

Summarised from FTCPD 1993.

bound to be political and bureaucratic sensitivities between TCPD, DOE, EPU and other agencies involved in planning and management of resources.

The FTCPD therefore has the appropriate machinery to develop the proposals made in Chapter 11. However, there is the critical issue of the availability of the right personnel to ensure that methodologies incorporate the principles and conditions for sustainable development, and must be within the limited costs and expertise available, and within a reasonable time frame. The overriding factor however is the commitment from the leadership. This issue is discussed under its own heading.

State Town and Country Planning Department [STCPD]

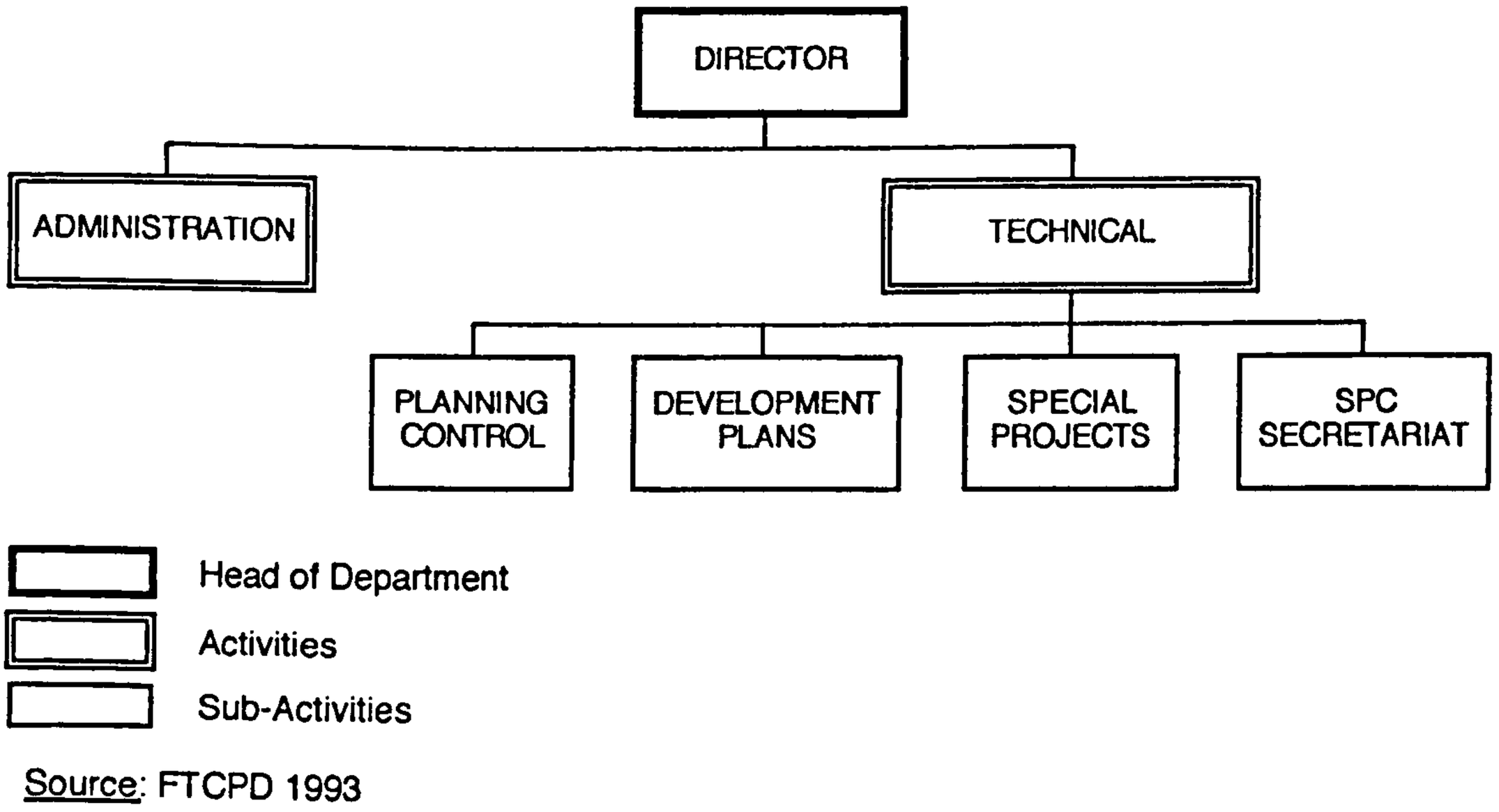
The STCPD is shown as part of the organization structure of FTCPD in Fig. 12.1. However the STCPDs are not federal agencies, but instead are state departments. Since town and country planning is under the concurrent list in the Constitution, the department is created by the state government for the purpose of advising it on matters related to planning and development of land, which is a state matter. The STCPD appears in the organization chart of the FTCPD because the professional staff [i.e. land use planners] are Federal Government Officers employed under the FTCPD, but seconded to the state government for the duration of service. In terms of policies and finance, the STCPD is under the authority of the State Government, while in terms of technical and land use planning service, it is under the control of the FTCPD, which acts as its headquarters at federal level. This organizational structure ensures the coordination of national policies and uniformity in professional and technical procedures among the states.This is also the normal arrangement in departments which provide services under the concurrent list, such as the Public Works Department, the Agriculture Department, the Forestry Department, and the like.

The organizational structure of a typical STCPD is illustrated in Fig. 12.2, and its functions and activities are listed in Table 12.4. The overall role of the TCPD is as adviser to the State Government, local planning authorities and other state or federal agencies which are operating at state and local levels on matters related to town and country planning and development of land. Its biggest role, which has a statutory backing under Act 172, is as the Secretariat to the State Planning Committee [SPC]. Functions of the SPC and TCPD as its Secretariat are examined in Chapter 8 and are therefore not elaborated here.

In contrast to the FTCPD, the STCPD already has a statutory backing for it to play its role as a responsible agency for SEA in land use planning. Its statutory functions with respect to the SPC, in particular on land use policies, establishment of a data bank, dissemination of information on land use, development and promotion of land use planning methodologies, provide the machinery for the development and promotion of a land use planning

methodology which integrates into it SEA and the related activities. In this context, the STCPD can be considered as a 'ready-available' machinery to promote SEA in land use planning - much more than FTCPD. However the need for coordination among all the states still requires that the overall responsibility be with the FTCPD.

FIG. 12.2: ORGANIZATION STRUCTURE OF A TYPICAL STATE TOWN AND COUNTRY PLANNING DEPARTMENT IN PENINSULAR MALAYSIA



Source: FTCPD 1993

Local Planning Authority [LPA]

As examined in Chapter 8 [Malaysian Land Use Planning] and reviewed in section 12.3, the LPA is the responsible agency for land use planning under Act 172, and hence the initiator for SEA in land use plans under the proposal in Chapter 11. However, as discussed in Chapter 7 [Malaysian Development Planning], the LPA has so far been ineffective in its role in land use planning, so that the preparation of structure and local plans are taken over by the FTCPD and STCPD.

By virtue of its statutory role in land use planning as provided by Act 172, the LPA can also be considered as a 'ready-available' machinery for SEA in land use planning. However, until the planning mechanism in the LPA is fully developed, the present contribution of the FTCPD and STCPD towards local level planning seems to be required for a considerable length of time.

Notwithstanding the contribution of the FTCPD and STCPD in planning, the LPA still has a major responsibility in monitoring the achievements of the plan, particularly in the path towards sustainable development, and in plan review. However, under the present

circumstances [i.e. insufficient manpower and finance], this responsibility would also seem too high to achieve. This means that dependence on the STCPD on this aspect, at least in terms of professional services, is still strong.

TABLE 12.4: PROFESSIONAL FUNCTIONS AND ACTIVITIES OF A TYPICAL STATE DEPARTMENT OF TOWN AND COUNTRY PLANNING

DIVISION AND UNITS	FUNCTIONS AND ACTIVITIES
TECHNICAL DIVISION	Facilitates the department's role as adviser to the State Authority, local authorities and other government agencies on town and country planning and spatial development, particularly with regards to Act 172.
• SPC Secretariat	Ensures the implementation of Act 172 and government policies, as well as establish a data bank; establishes guidelines for planning; and provides practical training for town and country planning students from institutes of higher learning.
• Development Plan Unit	Formulates urban policies for the state; responsible for coordination and preparation of development plans by local planning authorities; prepares urban redevelopment plans; and prepares new town plans and rural growth centres.
• Special Projects Unit	Prepares plans for special projects as requested by the state government, local authorities and other government agencies.
• Development Control Unit	Provides consultation service to the public, land administrators, local planning authorities and state governments on matters related to planning and development.

Summarised from FTCPD 1993.

Commitment from the leadership

At the time of this research, there have been no formal research projects or studies at the FTCPD or STCPD in response to the call for sustainable development, or to improve planning methods and approaches towards enhancing environmental input in development plans. However interviews between this researcher and the senior management [past and present] in 1992 reveal the awareness and need for the department to improve planning methodologies to comply with current movements on the environment. This awareness is also reflected in speeches and departmental papers which are presented at seminars and conferences.

The then Director-General of FTCDP expressed the need for the department to develop specific areas of specialization such as in economic planning, social planning, urban planning, landscape planning, demography, housing, transportation, environment and urban design [Mohd. Ishak 1988]. His recommendations include emphasis to be given to research and development to formalize thinking among various government agencies, private sector and higher institutions of learning; planning education which is equipped with current needs

and specialization with emphasis placed on applied planning practice and entrepreneurial skills; and collaboration between planners in public and private sectors and academics. The role of the urban planner should include monitoring changes in the living environment; review and amendmend of plans if necessary according to environmental changes; preparation of action plans if necessary; exercise effective public participation in planning; and consideration of conservation and preservation [Mohd. Ishak 1992a].

Under the FTCPD's management, structure plans have increased their level of environmental consideration. For instance, in the Klang Structure Plan, siting of forms of development take into consideration the Environmental Quality Act 1974; and the regional strategy for pollution control takes into consideration issues relating to sewage/sewerage, siltation, solid waste management, industrial and other development activities. Local plans have strengthened their environmental consideration too. The Tampoi, Larkin and Kempas Local Plan for instance include environmental problems/issues such as squatters, pollution, unplanned industries and congestion in urban centres.

With the Federal Government's pledge to the United Nations to develop its resources along a sustainable development path [UNCED 1992], and the adopted strategy that all government agencies should develop a programme for implementing the agreements made at Rio, it is anticipated that the FTCPD has to play a more active role in sustainable development planning. Although it has not been categorically stated, and the departmental work programme has not indicated so, the commitment is already there. However it is accepted that putting into practice the proposals in this thesis would require tremendous effort and utilise enormous resources.

12.5 PERSONNEL

Both the assessment of environmental impacts and land use planning involve complex, multi-disciplinary processes which require multi-disciplinary teams. Therefore integrating them together makes the single process more complex and requires teams of more diverse personnel. The need for scientists, ecologists, geologists and other environmental scientists in the land use planning team is apparent. The importance of inter-disciplinary teamwork is crucial.

Making these environmental scientists available in a single organization is difficult, and having them in the FTCPD is improbable. Beside the involvement of consultants from the private sector, inputs are expected from various sectoral agencies, one of them being the DOE. This section therefore reviews the availability of these personnel from some of the sources. The grouping of such diverse personnel requires 'generalist managers' to

coordinate and be responsible for non-technical experts, and to manage technical specialists. Therefore this section also looks at the availability of these 'generalist managers'. There is also a need for SEA education and training which focuses on practical and operational aspects, and this section also reviews the scope for this.

Potential for active involvement from the DOE

Like many government departments, the DOE faces shortages of personnel, especially professional staff. In 1991, there were only 58 professionals in the DOE to serve the whole country. Although these are complemented by sub-professionals, the shortage is still considered crucial by the department [personal interview with the Director-General 1992]. Table 12.5 shows the number of professionals and sub-professionals, together with the related disciplines in terms of qualification.

TABLE 12.5: PROFESSIONAL AND SUB-PROFESSIONAL STAFF BY DISCIPLINE IN DOE MALAYSIA.

Discipline	Professional	Sub-professional
ENGINEERING		
• Civil	3	27
• Electrical	0	18
• Electrical Power	0	13
• Electrical Communication	0	2
• Mechanical	6	10
• Chemical	14	0
• Agriculture	4	5
• Petroleum	0	6
SCIENCE		
• Ecology	4	0
• Environmental Science	17	0
• Physics	1	0
• Electronics	1	0
• Chemistry	3	0
• Industrial Chemistry	0	10
• Biochemistry	1	0
• Biology	1	0
• Microbiology	1	14
• Fisheries	0	8
• Health Science	0	4
• Forestry	0	2
• Food Technology	0	5
• Technology Chemistry	1	0
• Others	0	1
SOCIO-ECONOMIC		
• Resource Economics	1	0
TOTAL	58	125

Source: DOE 1992.

Of the 58 professionals in the DOE, only 11 are assigned to the Evaluation Section which is in charge of EIA and EIA monitoring and compliance. The rest are deployed in the Control Division which encompasses the Enforcement Section and Monitoring Section, and other section under the Development Division and Prevention Division, which includes the Environmental Input Section [in planning studies e.g. structure plans under Act 172], and in the state departments.

The study on the EIA system and procedure in 1992 by MAMPU concludes that one of the reasons for delay in the EIA procedure is the shortage of EIA reviewing officers at DOE. Table 12.6 shows that the ratio of one EIA reviewing officer to the number of EIA reports in 1988 [when EIA was made mandatory for activities included in the prescribed list] was 1:1. By 1991, the ratio has gone up to 1:16. While the number of EIA reports to be reviewed between 1988-1991 increased by 1,481.8 %, the number of reviewing officers during the same period increased by only 37.5 %.

TABLE 12.6: RATIO OF EIA REVIEWING OFFICER TO THE NUMBER OF EIA REPORTS RECEIVED BY DOE

Year	Number of Reviewing Officer	Number of EIA reports to review	Ratio of reviewing officer to EIA reports
1988	8	11	1:1
1989	8	36	1:5
1990	10	113	1:11
1991	11	174	1:16

Source: MAMPU 1992.

For the period 1991-2000, DOE estimates to receive more than 400 EIA reports, thus increasing the present workload. If the personnel situation is not improved, the volume of backlog will increase tremendously and cause more delays to development projects than the current situation, as shown in Table 12.7, which shows an increasing backlog, from 6 in 1988 to 118 in 1991.

TABLE 12.7: STATUS OF EIA REPORTS AS OF 31 DECEMBER 1991

Year	EIA reports received	Carried over from previous year	Reports to be reviewed in current year	Reports reviewed in current year	Reports carried over to next year
1988	11	0	11	5	6
1989	36	6	42	23	19
1990	113	19	132	73	59
1991	174	59	233	115	118

Source: MAMPU 1992.

Another DOE manpower problem identified by MAMPU is that the EIA reviewing officers lack experience. 63.7 % of the personnel have experience of less than 10 years, while 18.2 % have less than 5 years of experience [Table 12.8]. Only two have post-graduate qualifications and most are not exposed to new technologies and approaches to development.

TABLE 12.8: LENGTH OF SERVICE OF EIA REVIEWING OFFICERS AT DOE

Length of service	No. of Review Officers	%
10 years or more	4	36.3
5 years to 10 years	5	45.5
Less than 5 years	2	18.2

Source: MAMPU 1992

The above state of affairs clearly indicates the great shortage of reviewing officers at DOE. Therefore to expect active manpower input from DOE in SEA is rather futile. However input in terms of advisory service and consultation from DOE is not ruled out.

Potential of input from departments with 'environment-related activities'

Only 14 out of 41 departments which responded to the Information Availability Survey in 1992, i.e. 28.6 % of the respondents, indicate that they have personnel with qualifications [ranging from attendance at seminars, to Ph.D.holders] in EIA or EIA-related disciplines, providing a total of 54. The departments constitute 17.3 % of departments which are considered to have environment-related activities. Examples of qualifications of these personnel are listed in Table 12.9. The figures are not very encouraging to the proposal to integrate SEA into the national planning process, when all government departments will be expected to actively play their part in environmental impact assessment of all policies, plans and programmes. Therefore the implementation of the proposal is expected to meet many hurdles, particularly in the availability of personnel, at least in the early years.

When associated with the number of departments listed in Table 12.11, departments with qualified personnel in EIA or EIA-related disciplines form 48.3 % of departments which have participated in EIA. This indicates that the number of qualified personnel in EIA is not the overriding factor for participation and involvement in EIA. When this principle is also adopted for SEA, the potential for SEA seems better, particularly when the personnel are supplemented by the private sector. As of August 1992, the DOE has listed 93 consultant firms which are qualified to perform EIA or EIA-related activities [DOE 1992]. The breakdown of these firms in terms of areas of specialization is listed in Table 12.10.

TABLE 12.9: QUALIFICATIONS IN EIA OR EIA-RELATED COURSES OF PERSONNEL IN SOME PUBLIC AGENCIES [OTHER THAN THE DEPARTMENT OF ENVIRONMENT]

Departments/Agencies	EIA Qualification/Exposure	Training Institutions	No. of Officers	Remarks
Public Works Department [Water Supply Branch]	M.Sc.[Eng] Environmental Civil Eng.	Liverpool Uni. U.K.	1	EIA & dam construction.
	M.Sc. Environmental Eng..	Newcastle Uni. UK.	1	Water Quality.
	M.Sc.Env. Science & Technology.	International Inst for Hydraulics & Env. Eng, Delft, Neth.	1	Environmental-related subjects.
PETRONAS [Marine Division	Degree Course.	University of Aberdeen, Scotland. U.K.	2	
National Electricity Board	In-service training.	Malaysian Training Inst. for Public Administration.	2	
	Degree Course.	Stirling Uni. U.K.	1	
Agriculture Department	M.Sc.	Overseas	3	Water Management & Soil Conservation.
	B.Sc.	Local	5	Soil Science.
	Dip. Agriculture.	Local	5	Agriculture.
Agricultural Research & Devt.Institute Malaysia [MARDI]	In-service Training	National University	3	1 from Agric. Eng. Division. 1 from Fund. Research Division. 1 from Techno-Economic Research Division.
National Parks Department	M.Sc [Wildlife Management]	West Virginia University, US.	2	Part of Wildlife Technique Course.
	B.Sc.[Wildlife Resources]	West Virginia University, US.	1	Part of Wildlife Technique Course.
Urban Development Authority	In-service Training	Malaysian Training Institute for Public Administration.	3	
State Economic Development Corporation [Johor State]	4-days Seminar	National University		
Town & Country Planning Dept	Attending Seminars	Local	12	Three more planners will be sent to attend Environmental and EIA-related post-graduate courses.
	Short Courses	Local	5	
	Long Courses [M.Sc.]	London & Stirling, U.K.	2	
Kuala Lumpur City Hall	Certificate Course	Aberdeen Uni. U.K.	1	
Agriculture Uni [Sc.& Env.]	Ph.D.	Uni. of London.	1	
Science Uni [Housing. Building & Planning]	Degree	Uni of East Anglia, U.K.	1	
	In-service Training	University Consultancy	2	

Information Availability Survey: August - October 1992.

TABLE 12.10: AREAS OF SPECIALIZATION OF 93 CONSULTANT FIRMS REGISTERED WITH DOE MALAYSIA

Areas of specialization	No. of firms
Acoustics and vibrations	1
Agricultural information systems	1
Air quality	2
Architectural design	6
Drainage and irrigation	9
Earthworks	1
Ecological studies	3
Economic studies	2
Electrical and structural engineering	13
Environmental chemistry research	7
Environmental engineering	4
Environmental engineering research	8
Environmental health engineering and sewerage	5
Environmental Impact Assessment [EIA]	35
Environmental modelling and simulation	2
Environmental monitoring, surveillance and auditing	18
Environmental planning and management studies	16
Environmental pollution control	8
Environmentally sound technology	3
Fire risk engineering	3
Fisheries studies	1
Forestry and reforestation	2
Highways and traffic	3
Hydroelectric and thermo-generating	3
Landscape architecture	3
Legal representation	1
Marine and coastal engineering	4
Natural resources studies	1
Oceanography	1
Organic farming	1
Paper and pulp industry	1
Petroleum and chemical spill clean up	1
Ports and harbours	1
Process design	1
Project management	7
Quarrying and mining engineering	8
Remote sensing and GIS	1
Risk assessment	12
Risk management	5
Soil, geotechnical and geophysical studies	9
Toxic and hazardous waste clean up	12
Transportation engineering	1
Urban planning, land use development and building regulations	14
Waste management	4
Water resources and hydrology	25

Summarised from DOE 1992.

Table 12.10 shows that the 93 consultant firms have 45 areas of specialization, and 35 of them conduct EIA studies. Areas of specialization with many firms, such as electrical and structural engineering [13 firms], risk assessment [12 firms] and toxic and hazardous waste clean up [12 firms] indicate the emphasis on project EIA.

It is also encouraging that areas of specialization which are also associated with development and land use planning also have many firms specializing in them. Examples are environmental monitoring, surveillance and auditing [18 firms], environmental planning and management studies [16 firms], urban planning, land use development and building regulations [14 firms] and water resources and hydrology [25 firms]. 26 other areas of specialization have 5 or fewer firms specializing in them, and the rest have between 5-10 firms.

Although the situation is not very good here, there is a potential for more firms which specialize in environmental impacts of land use planning to be set up, thus providing the potential for the development of SEA in Malaysia. In the early years of implementation, it is expected that SEA exercises would be experimental in nature, and that will provide the room for research and the development of expertise in the relevant fields.

Potential from the TCPD

The TCPD is the best source of 'generalist managers' to manage the multi-disciplinary teams in land use planning with SEA. Being a multi-objective and multi-disciplinary profession itself, land use planners should be able to coordinate and be responsible for non-technical experts, and to manage technical specialists. The following paragraphs review the personnel situation in the TCPD at all levels and assess the potential capability of these personnel to manage national integrated planning, and land use planning which integrates within it SEA.

Section 8.5.2 [National integrated planning] describes the findings of interviews between this researcher and several land use planning and environmental personnel from Peninsular Malaysia on several related issues in 1992. For clarity of discussion, the issues are summarised below:

1. In terms of job-functions the FTCPD is capable of being the responsible agency for SEA [land use plans] but at current status of manpower in the TCPD, it might not be able to cope with additional functions and responsibilities;
2. The TCPD is capable of providing physical inputs in macro- and micro-socioeconomic plans, provided that additional manpower for multi-disciplinary planning teams is available;
3. The TCPD is capable of managing SEA exercises, provided that additional manpower for multi-disciplinary planning teams is available; and
4. Current structure and local plan project managers are capable of managing the multi-disciplinary team for land use planning with SEA, but with additional training and more interaction and exchange of knowledge between government planners and specialists from other departments, universities and the private sector.

Having in mind the above reservations on the capability of the FTCPD to manage SEA, Table 12.11 illustrates the land use planning personnel situation in the public sector in Peninsular Malaysia.

Table 12.11 shows existing and proposed number of professionals at the FTCPD by divisions and units in the department, as well as those at state and local levels. Indications of shortfalls in the manpower are also indicated. The biggest number of planning professionals [70.5 %] in the FTCPD are deployed in the Development Plans Division where the majority are involved in the preparation of structure and local plans under Act 172. This activity in fact constitutes 43% of the 1992 annual budget of the FTCPD [FTCPD 1992a], indicating the big concern of the department in the preparation of these plans. This emphasis is likely to be there for a considerable time, as indicated by the proposed increase from 86 to 117, i.e by 36 %. The biggest proposed increase [300 %] however is for the Corporate Planning Unit; second biggest increase [233 %] is for the Public Gardens and Parks Unit and the third biggest increase [200 %] is for the Legislation and Coordination Unit.

Although the consensus is that there is a shortage of professionals in the department, it is believed that with appropriate commitment from the leadership, the introduction of SEA in land use planning is not beyond the capability of the department. The proposed increases in the personnel have been made for activities which are most relevant for the tasks. However it is a shortfall that appropriate increases have not been proposed for the Data Bank Unit and the Research Unit, for these units are very crucial for the development of the proposed system. In fact in terms of the percentage of allocation of professionals, these two units constitute two of the lowest percentages - 3.3% for the former and 4.9% for the latter. In the proposed figures, these percentages drop to 2.8% and 3.4% respectively. This unfortunately seems to indicate the lower degree of emphasis given to data bank and research.

Despite the heavy responsibilities given to the STCPDs, only 19.9 % of the total public sector [excluding Kuala Lumpur] planning professionals are deployed at the state level. However the situation is expected to improve if the proposed increase of 209 % materialise. With these increases, the potential for making SEA and the related activities as part of the planning practice is brighter.

The local planning authorities still do not seem to fare better, with only 51 % expected increase in the number of professionals. This indicates that the burden of preparing, monitoring and reviewing land use plans is still with the FTCPD and STCPDs.

TABLE 12.11: PROFESSIONAL PLANNING PERSONNEL IN THE PUBLIC SECTOR IN PENINSULAR MALAYSIA

	Existing [1992]		Proposed		% Incr.
	No.	%	No.	%	
FEDERAL PLANNING DEPARTMENT					
Senior Management	3	-	3	-	-
• Strategic Planning Division	8	6.5	16	9.0	100
- Corporate Planning Unit	2	1.6	8	9.0	300
- Spatial Planning Unit	5	4.1	7	3.9	40
• Development Plans Division	86	70.5	117	65.7	36
- Northern Branch	20	16.4	26	14.6	30
- Central Branch	23	18.9	29	16.3	26
- Southern Branch	20	16.4	26	14.6	30
- Eastern Branch	23	18.9	36	20.2	57
• Planning Input Division	14	11.5	18	10.1	29
- Data Bank Unit	4	3.3	5	2.8	25
- Research Unit	6	4.9	6	3.4	0
- Legislation and Coordination Unit	1	0.8	3	1.7	200
- Training and Manpower Planning Unit	2	1.6	3	1.7	50
• Parks and Landscape Planning Division	11	9.0	24	13.5	118
- Gardens and Parks Unit	3	2.5	10	5.6	233
- Landscape Planning Unit	7	5.7	13	7.3	86
FEDERAL PLANNING DEPARTMENT	122	-	178	-	46
CADER POSTS AT OTHER MINISTRIES	6	-	15	-	150
TOTAL AT FEDERAL LEVEL	128	-	193	-	51
STATE PLANNING DEPARTMENTS	43	-	133	-	209
LOCAL AUTHORITIES [Excl. KL]	45	-	68	-	51
TOTAL PENINSULAR MALAYSIA	216	-	394	-	91

At a ratio of 1 professional for every 30,000 population, the planning manpower situation is :

	1992		2000		% Incr.
Required no. of planning professionals	600	-	755	-	26
Level of provision/proposed	216	-	394	-	82
Shortfall[a]	384	-	361	-	-
% of Shortfall[a]	64	-	48	-	-25

[a] The shortfall is partly made up by Planning Officers in Kuala Lumpur City Hall [in 1992 there were 50] and by planning professionals from the private sector [in 1993, 37 professional planners were registered with the Malaysian Institute of Planners]. This gives an approximate shortfall of 297 [50%] in 1992.

Computed from FTCPD 1992a, FTCPD 1992b, FTCPD 1993, Mohd. Ishak 1988.

Using a ratio of one planner to every 30,000 population [Mohd. Ishak 1988], there is a current shortfall of 384 planning professionals i.e. 64 %, which is a very big shortfall. With the proposed increase in the number of professionals, this shortfall is expected to drop to 48 % , which is still a high figure by any standard. This shortfall in the public sector is complemented by private sector planners. In 1993, 37 of these planners were registered with the Malaysian Institute of Planners [MIP]. The areas of specialization of these planning consultants are listed in Table 12.12. It is noted that to date, registration with the MIP is not a prerequisite for practising land use planning in Malaysia. The proposed Planners Bill which will make this mandatory will only be tabled to Parliament in the middle of 1994.

TABLE 12.12: AREAS OF SPECIALIZATION OF 37 LAND USE PLANNING CONSULTANTS WHO ARE REGISTERED WITH THE MALAYSIAN INSTITUTE OF PLANNERS

Areas of specialization	Planning consultants
Advocacy planning	1
Architectural services	6
Environmental Impact Assessment [EIA]	4
Feasibility studies	9
Housing development	2
Landscape planning, design and architecture	3
Layout planning	9
Local plans preparation	2
New town development plans	3
Policy and plan impact evaluation	1
Project planning and management	13
Rural settlement planning	2
Structure plans preparation	3
Tourism and hotel development planning	1
Town Centre Planning and Urban Renewal	3
Traffic and transport planning	1
Urban and civic design	5

Summarised from MIP 1993.

Table 12.12 shows only 2 planning firms which prepare local plans and 3 firms which prepare structure plans under Act 172. This is a misrepresentation because the list of consultants who are involved in structure plans under FTCPD management is more. This is because, as stated before, most planning consultants are not registered with the MIP. The FTCPD has listed 21 planning consultant firms which have participated in structure plans, excluding input from universities [FTCPD 1991]. It is noted that there is no shortage of land use planning consultants who can participate in structure and local plans. Given the right management from the FTCPD, the integration of SEA in land use planning should be able to be carried out reasonably well, albeit gradually.

Table 12.12 also includes 4 planning firms which undertake EIA studies, while it is very encouraging to note that there is one firm which can undertake policy and plan impact

evaluation. There is only one firm which specializes in advocacy planning, indicating the low level of public participation in land use planning in Malaysia.

12.6 INFORMATION

Having accepted the need to strive for strong sustainability, the operational version for sustainable development in this thesis is the 'sustainability limit' [see Chapter 2]. Given this version, the vital information needed for an SEA exercise is the carrying capacity of the natural environment. However, as stated in Chapter 2, information on the carrying capacity is difficult to derive because of the lag in scientific discoveries and information on the natural environmental stock. Therefore in view of these uncertainties, the 'precautionary principle' which is adopted requires for conservation of the natural environment. Within this framework, the following types of information are required for SEA:

1. The stock of environmental resources, what state they are in, and what influence human activities exert on them; and
2. What impact current land use development plan policies are having on the stock and quality of these environmental resources.

Information on the natural environmental stock is greatly lacking, even in developed countries. However there are no fixed rules on what aspects of the environmental stock need to be assessed. The aim is to be as comprehensive as possible concerning natural, man-made and human resources.

Malaysia is still to have any State of the Environment Report for any area. The nearest to it are: the annual Environmental Quality Report by the DOE which contains some information on environmental monitoring for pollution control, mainly on air and water quality; and the Environment Reports which are prepared for structure plans, which also mainly contain information on sources and level of pollution in the planning areas. The level and type of information in these reports are only part of the information types that are necessary to assess environmental impacts of human activities on the environment.

The examination of sustainable development principles in Chapter 2, guidelines on environmental appraisal and some approaches to SEA in the UK [see Chapters 3 and 4] form the basis for the list of environmental information for SEA. The list is not comprehensive nor definitive, since planning is contextual and hence information gathering is within the context of the planning area. However it is sufficient as a basic checklist for further information gathering. The list of environmental information listed in Table 12.13 is grouped to fit in with DOE's 'Checklist of Environmental Components' [see Table 9.1], so as to facilitate an easy extension of the EIA process to SEA. The slight but necessary differences are as below:

PROPOSED ENVIRONMENTAL LIST	DOE'S ENVIRONMENTAL LIST
A. PHYSICO-CHEMICAL	A. PHYSICO-CHEMICAL
1. Land	1. Land
2. Surface Water	2. Surface Water
3. Groundwater	3. Groundwater
4. Atmosphere	4. Atmosphere
5. Noise	5. Noise
6. Energy	
B. BIOLOGICAL	B. BIOLOGICAL
1. Species and populations	1. Species and populations
2. Habitats	2. Habitats
C. HUMAN	C. HUMAN
1. Health and safety	1. Health and safety
2. Land use and agriculture	2. Social and economic
3. Social and economic	3. Aesthetic and cultural
4. Waste	
5. Landscape and townscape	
6. Openspace	

Table 12.13 provides four sets of information: the basic information types; indication of whether or not the information are normally considered in a typical structure plan; the potential sources of information; and a general description of the scale of availability of information.

Out of 169 information types, only 68 [40.2%] are normally considered in a typical structure plan in Malaysia. By major breakdown, only 28% of the items under Physico-Chemical are normally considered, 40% under Human and none at all under Biological. These identifications are derived by examining the four Malaysian structure plans of Muar, Petaling, Melaka and Langkawi [examined in Chapter 8]. In terms of the scale of availability, 102 [60.4%] are available only for case study/project areas, while no source has been detected for 18 [10.7%] information types. This state of affairs does not make the introduction of SEA in Malaysia an easy or a cheap task, since more information needs to be collected for any SEA exercise. It is noted here that the information types in Table 12.13 do not include other information which is normally collected for structure/land use plans.

Notwithstanding the deficiency in environmental information, there is a potential for more environmental information than that identified in Table 12.13. The Information Availability Survey conducted for this research in 1992 reveals that out of 49 government departments which responded to the survey, 29 [59.2%] replied that they have participated in EIA studies, and hence can be expected to appreciate the need for information from their departments to be made available for SEA. These departments form 35.8 % of departments [total of 81] which are identified as having environment-related activities and hence selected for the survey. The respective departments, the types of EIA projects they have been involved in, and their form of participation in EIA are listed in Table 12.15. The detailed information on the EIA projects are listed in Appendix E. It can be seen from the table that the

TABLE 12.13: AVAILABILITY OF ENVIRONMENTAL INFORMATION FOR SEA [STRUCTURE PLAN] IN MALAYSIA

Information types	Considered in a typical structure plan YES	Considered in a typical structure plan NO	Potential source[s] [Departmental numbers are as in Table 12.14]	Remarks on availability
A PHYSICO-CHEMICAL				
1. LAND				
• Topography				
- Uplands and plains	/		1, 2, 10, 15, 17, 22, 40	• For all areas.
- River valleys	/		1, 2, 10, 15, 17, 22, 40	• For all areas.
- Flood plains and swamps	/		1, 2, 10, 15, 17, 22, 40	• For all areas.
• Soil profile		x	1, 10, 17	• For all areas
• Soil composition		x	3, 10, 11, 13, 16, 17, 18, 20, 22, 23, 24, 29, 37, 38, 40	• For all areas; case studies/projects.
• Slope composition/stability		x	1, 2, 10, 17, 22, 38, 40	• Case studies/projects; Topographical maps.
• Subsidence and compaction		x	1, 10, 17, 22	• Case studies/projects.
• Geology				
- Solid geology		x	1, 2, 17, 22	• For all areas/projects.
- Drift geology		x	1, 2, 17, 22	• For all areas/projects.
- Seismicity		x	1, 2, 17, 22	• Case studies/projects.
• Engineering and Mineral resources	/		1, 2, 13, 17, 22, 33, 38	• Case studies/projects.
• Unique features		x	1, 2, 10, 15, 17, 22, 40	• Case studies/projects.
• Resource value		x	10. 13, 15, 17	• Case studies/projects.
2. SURFACE WATER				
• Flow variation and water supply		x	11, 13, 17, 24, 25	• All catchment areas.
• Water quality				
- Water quality monitoring	/		4, 5, 10, 13, 16, 20, 22, 25, 30, 40, 41	• Major rivers, case studies/projects.
- Quality of rivers and streams	/		- ditto -	• Major rivers, case studies/projects.
- Quality of standing waters		x	- ditto -	• Case studies/projects.
- Quality of groundwaters		x	- ditto -	• Case studies/projects.
- Quality of estuarine & coastal waters	/		- ditto -	• Major estuaries, case studies.

TABLE 12.13: [CONT. 1]

Information types	Considered in a typical structure plan YES	Considered in a typical structure plan NO	Potential source [Departmental numbers are as in Table 12.14]	Remarks on availability
- Quality of offshore waters		x	- ditto -	• Regular monitoring, case studies
- Water pollution sources & impacts	/		4, 5, 10, 13, 16, 17, 20, 21, 23, 25, 37, 39, 41	• Case studies/projects.
• Radioactive discharges				• Undetected.
- Drinking water quality		x	17, 22, 25, 41	• Case studies/projects.
• Existing use	/		11, 13, 17, 24, 25	• Catchment areas and supply systems.
• Drainage pattern	/		11, 13, 14, 17	• Topographical maps.
• Flood defence	/		11, 13	• Case studies/projects.
3. GROUNDWATER				
• Water table depth		x	1, 4, 13, 25, 40	• Case studies/projects.
• Flow regime		x	13	• Case studies/projects.
• Water quality		x	1, 4,	• Case studies/projects.
• Recharge		x	13, 22, 30	• Case studies/projects.
• Aquifer characteristics		x	22, 13,	• Case studies/projects.
• Existing use		x		
4. ATMOSPHERE				
• Air quality				
- Smoke and SO_2	/		8, 16, 17, 23, 32, 39, 41	• Case studies/projects.
- Nitrogen Oxides [NO_x]	/		- ditto -	• Case studies/projects.
- Grit, dust and fumes	/		- ditto -	
- Noxious emissions	/		- ditto -	
- Odour	/		- ditto -	
- Vehicular emissions	/		- ditto -	
- Acid rain		x	41	• Case studies/projects.
- Global warming and sea levels		x	41	• Case studies/projects.
- Radiation		x	17, 22, 25	• Case studies/projects.
• Climate				
- Rainfall		x	3, 4, 13, 32, 37, 40	• Monitoring stations, case studies/projects.
- Temperature		x	3, 4, 13, 32, 37, 40	• Monitoring stations, case studies/projects.
- Wind		x	17, 32, 40	• Monitoring stations, case studies/projects.

TABLE 12.13: [CONT. 2]

Information types	Considered in a typical structure plan YES	Considered in a typical structure plan NO	Potential source [Departmental numbers are as in Table 12.14]	Remarks on availability
- Climate trends [inversions]		x	4, 32	• Monitoring stations.
• Visibility				
5. NOISE				
• Noise units and indices	/		16, 17, 39, 41	• Monitoring stations, case studies/projects.
• Noise nuisance	/		16, 17, 39, 41	• Monitoring stations, case studies/projects.
• Noise complaints		x	16, 17, 39, 41	• Case studies/projects.
• Domestic noise	/		7, 16, 17, 25, 36, 41	• Case studies/projects.
• Industrial & commercial noise	/		7, 16, 17, 25, 36, 41	• Monitoring stations, case studies/projects.
• Construction site noise	/		7, 16, 17, 25, 36, 41	• Case studies/projects.
• Noise in streets	/		16, 17, 39, 41	• Case studies/projects.
• Transport noise	/		16, 17, 39, 41	• Monitoring stations, case studies/projects.
• Road traffic noise	/		16, 17, 39, 41	• Monitoring stations, case studies/projects.
• Railway noise	/		7, 16, 17, 25, 36, 41	• Monitoring stations, case studies/projects.
• Entertainment & leisure noise		x	26	• Assists local authorities
• Occupational noise	/		26	• Assists local authorities
• Noise abatement notices		x	26	• Assists local authorities
• Noise abatement zones		x	26	• Assists local authorities
• Intensity		x	26	• Assists local authorities
• Duration		x	26	• Assists local authorities
• Frequency		x	26	• Assists local authorities
6. ENERGY				
• Energy sources, production & supply				
- Electricity	/		4, 8, 16, 17, 23	• Whole country, case studies/projects.
- Gas		x	4, 8, 16, 17, 23	• Whole country, case studies/projects.
- Solid and liquid fuels		x	4, 8, 16, 17, 23	• Whole country, case studies/projects.
- Other reserves		x	4, 8, 16, 17, 23	• Whole country, case studies/projects.
• Energy consumption/conservation		x	8, 16, 17, 23	• Whole country, case studies/projects.
• Renewable and alternative resources		x	16, 17	• Case studies/projects.
• Environmental effects				• Undetected.

TABLE 12.13: [CONT. 3]

Information types	Considered in a typical structure plan YES	Considered in a typical structure plan NO	Potential source [Departmental numbers are as in Table 12.14]	Remarks on availability
- Acid rain		x	4, 8, 16, 17, 32, 41	• Case studies/projects.
- Global warming		x	4, 32, 41	• Case studies/projects.
- Other environmental effects		x	4, 32, 41	• Case studies/projects.
• Energy efficiency		x	4, 8, 16, 17, 23, 41	• Case studies/projects.
B BIOLOGICAL				
1. SPECIES AND POPULATIONS				
• Terrestrial vegetation		x	4, 20	• Case studies/projects.
• Terrestrial wildlife		x	4, 13, 20	• Case studies/projects.
• Other terrestrial fauna		x	4, 13, 20	• Case studies/projects.
• Aquatic/Marine Flora		x	4, 8, 13, 14, 20	• Case studies/projects.
• Fish		x	13, 20, 8, 20	• Case studies/projects.
• Other aquatic/marine fauna		x	4, 20	• Case studies/projects.
• Threats to wildlife		x	4, 13, 20	• Case studies/projects.
2. HABITATS				
• Terrestrial habitats		x	4	• Case studies/projects.
• Terrestrial communities		x	4	• Case studies/projects.
• Aquatic habitats		x	4	• Case studies/projects.
• Aquatic communities		x	4	• Case studies/projects.
• Estuarine habitats		x	4, 19, 20, 24	• Case studies/projects.
• Estuarine communities		x	4, 19, 20, 24	• Case studies/projects.
• Marine habitats		x	4	• Case studies/projects.
• Marine communities		x	4	• Case studies/projects.
• Habitat and species protection		x	4	• Case studies/projects.
• Threats to wildlife		x	4	• Case studies/projects.
• Habitat changes		x	4	• Case studies/projects.

TABLE 12.13: [CONT. 4]

Information types	Considered in a typical structure plan YES	Considered in a typical structure plan NO	Potential source [Departmental numbers are as in Table 12.14]	Remarks on availability
C HUMAN				
1. HEALTH AND SAFETY				
• Physical safety		x	11, 13, 17, 25, 31	• Case studies/projects.
• Psychological well-being		x	25, 17	• Case studies/projects.
• Parasitic disease		x	8, 9, 13, 17, 24, 25, 27	• Case studies/projects.
• Communicable disease		x	8, 9, 13, 17, 24, 25, 27	• Case studies/projects.
• Sanitation and sewerage		x	9, 11, 13, 17, 24, 25, 26, 28	• Case studies/projects.
• Physiological disease			17, 25	• Case studies/projects.
• Disease vectors			17, 25	• Case studies/projects.
2. LAND AND AGRICULTURE				
• Land use	/		8, 13, 18, 22, 27, 35	• Nation-wide, case studies/projects.
• Buildings	/		8, 11, 12, 13, 14, 27	• Nation-wide, case studies/projects.
• Improved arable land		x	11, 12, 13, 18, 37	• Nation-wide, case studies/projects.
• Agricultural land classification		x	8, 11, 13, 18, 24	• Nation-wide, case studies/projects.
• Farming classification		x	8, 11, 13, 18, 24	• Nation-wide, case studies/projects.
• Commercial forestry		x	11, 12, 13, 18, 37	• Nation-wide, case studies/projects.
• Game		x	21	• Nation-wide, case studies/projects.
• Commercial fisheries		x	20	• Nation-wide, case studies/projects.
• Environmental effects		x	18, 19, 21	• Nation-wide, case studies/projects.
3. SOCIAL AND ECONOMIC				
• Employment				
- Land and facilities	/		8, 11, 13, 17, 24, 27	• Case studies/projects.
• Housing			8, 11, 12, 13, 27, 28	• Case studies/projects.
- Land for housing	/		13, 24, 27, 28	• Case studies/projects.
- Location	/		11, 13, 17, 24, 27	• Case studies/projects.
• Transportation				
- Transport networks	/			
- Comparison of transport infrastructure	/			

TABLE 12.13: [CONT. 5]

Information types	Considered in a typical structure plan YES	Considered in a typical structure plan NO	Potential source [Departmental numbers are as in Table 12.14]	Remarks on availability
- Effects on human beings, buildings & man-made features		x		• Undetected.
- Effects on fauna, flora & geology		x		• Undetected.
- Effects on land		x		• Undetected.
- Effects on water		x		• Undetected.
- Effects on air and climate		x		• Undetected.
- Other indirect & secondary effects		x		• Undetected.
• Traffic management	/		11, 16, 27, 29	• Case studies/projects.
• Promotion of public transport		x		• Undetected.
• Industries	/		8, 13, 14, 24, 27, 33	• Case studies/projects.
4. WASTE				
• Hazardous waste dispersal			17, 20, 22, 25, 39	• Case studies/projects.
• Waste and litter	/		11, 13, 14, 17, 25, 26, 27, 31, 39	• Case studies/projects.
- Waste arising	/			
• Waste deposited	/		11, 13, 14, 17, 25, 26, 27, 31, 39	• Case studies/projects.
- Waste management facilities		x	4, 17, 22, 24, 25	• Case studies/projects.
- Landfill sites		x	42	• Case studies/projects.
- Site licensing		x	42	• Case studies/projects.
- Enforcement and complaints		x		• Undetected.
- Waste recycling		x		• Undetected.
• Environmental effects				
- Restoration aftercare		x		• Undetected.
- Monitoring		x		• Undetected.
- Litter	/		42	• Case studies/projects.
5. LANDSCAPE AND TOWNSCAPE				
• The landscape resource				
- scenic quality survey		x	27, 42	• Case studies/projects.
• Landscape protection				
- Areas of outstanding natural beauty		x	27, 42	• Case studies/projects.
-Areas of special landscape		x	27, 42	• Case studies/projects.

TABLE 12.13: [CONT. 6]

Information types	Considered in a typical structure plan YES	Considered in a typical structure plan NO	Potential source [Departmental numbers are as in Table 12.14]	Remarks on availability
- Countryside areas	/		27, 42	• Case studies/projects.
- Coastline	/		27, 42	• Case studies/projects.
- Green belts	/		27, 42	• Case studies/projects.
- Historic landscape features	/		27, 42	• Case studies/projects.
• Landscape change				
- Degradation of landscape		x	27, 42	• Case studies/projects.
- Mineral extraction	/		27, 42	• Case studies/projects.
- Derelict land	/		27, 42	• Case studies/projects.
- Housing development	/		27, 42	• Case studies/projects.
- Landscape enhancement	/		27, 42	• Case studies/projects.
• Townscape Resource				
- Listed buildings	/		27, 42	• Case studies/projects.
- Conservation areas	/		27, 42	• Case studies/projects.
- Townscape trees	/		27, 42	• Case studies/projects.
• Townscape change				
- Degradation of townscape		x	27, 42	• Case studies/projects.
- Enhancement of townscape	/		27, 42	• Case studies/projects.
- Urban programme areas	/		27, 42	• Case studies/projects.
- Town centre improvements	/		27, 42	• Case studies/projects.
- General improvement areas	/		27, 42	• Case studies/projects.
- Housing action areas	/		27, 42	• Case studies/projects.
- Housing renewal areas	/		27, 42	• Case studies/projects.
- Other townscape improvements	/		27, 42	• Case studies/projects.
6. OPEN SPACE				
• Urban open space				
- Use	/		17, 42	• Case studies/projects.
- Standards	/		17, 42	• Case studies/projects.
- Parks	/		17, 42	• Case studies/projects.
- Other public open space	/		17, 42	• Case studies/projects.
- Playing fields	/		11, 13, 14, 17, 19, 24, 27, 28	
- Educational open space	/		17, 42	• Case studies/projects.

TABLE 12.13: [CONT. 7]

Information types	Considered in a typical structure plan		Potential source [Departmental numbers are as in Table 12.14]	Remarks on availability
	YES	NO		
- Total urban open space	/		17, 42	• Case studies/projects.
• Rural open space				
- Countryside management		x		• Undetected.
- Country parks and picnic sites		x		• Undetected.
- Access to open country	/		17, 42	• Case studies/projects.
- Rights of way Network		x		• Undetected.
- Recreational routes		x		• Undetected.
- Total rural open space		x		• Undetected.
• Environmental impacts		x		• Undetected.
• Threats				
- Loss of open space to development	/		17, 42	• Case studies/projects.
- Maintenance difficulties		x	42	• Case studies/projects.
- Deliberate damage & vandalism		x	42	• Case studies/projects.
• Cultural facilities		x	8, 11, 13, 12, 24	• Case studies/projects.

Sources: Information Availability Survey August - September 1992, Peninsular Malaysia.
DOE 1987

types of information that are expected to be collected for EIA projects are in most cases relevant for SEA, albeit at different scales.

TABLE 12.14: ORGANISATIONS/GOVERNMENT DEPARTMENTS WITH ENVIRONMENTAL INFORMATION

[Note: These organisations/departments are to be read with Table 12.13]

1. Geology Dept., Univ. of Malaya.
2. Geology Dept., National Univ.
3. Engineering Fac., Agriculture Univ.
4. Science & Environment Fac., Agriculture Univ.
5. School of Chemical Sciences, Science Univ.
6. School of Physics, Science Univ.
7. School of Housing, Building and Planning, Science Univ.
8. Economics and Administration Fac. Univ. of Malaya.
9. Public Health Dept. Medical Faculty, Univ. of Malaya.
10. National Electricity Board.
11. Federal Land Development Authority.
12. Federal Land Consolidation and Reclamation Authority.
13. Lembaga Kemajuan Pahang Tenggara.
14. Lembaga Kemajuan Johor Tenggara.
15. Urban Development Authority.
16. Marine Dept. Petronas Nasional [PETRONAS]
17. PETRONAS Carigali.
18. Malaysian Agricultural Research.
19. Department of Forestry.
20. Fisheries Research Institute.
21. Veterinary Services Department.
22. Geological Survey Department.
23. Palm Oil Research Institute of Malaysia.
24. Klang Valley Planning Secretariat.
25. Engineering Services Division, Ministry of Health.
26. Local Government Division, Ministry of Housing and Local Government.
27. Federal and States Town and Country Planning Department
28. National Housing Department.
29. Public Works Department [Road Design Research Division].
30. Water Division, Public Works Dept.
31. Standard Institute and Research Institute Malaysia.
32. Meteorological Services Dept.
33. Land and Mines Dept.
34. Museums Dept.
35. Survey and Mapping Dept.
36. Factory and Machinery Dept.
37. Rubber Research Institute of Malaysia.
38. Mining Department, Malaysia.
39. Environmental Protection Society of Malaysia.
40. Sarawak Shell Berhad.
41. Department of Environment Malaysia.
42. Local Authorities.

Source: DOE 1987.

Use of GIS

The use of the Geographical Information System [GIS] in Malaysia is relatively new, but is currently being debated as the answer to planning and decision-making for sustainable development. Many government departments are looking into the establishment of the system in their organisations, while several have started experimenting with some systems, although many are still in their preliminary stages.

The need for a wider network of GIS for national resource planning and management is acknowledged. However in a study for a Spatially Dis-aggregated Data-base for the purposes of National Spatial Planning in Malaysia [UNDP 1993], the focus was only around the Economic Planning Unit [EPU] of the Prime Minister's Department and the State Economic Planning Units [SEPUs], although it was admitted that there is no likelihood of SEPUs being incorporated into an EPU corporate GIS in the foreseeable future. There was

TABLE 12.15: FORM OF EIA PARTICIPATION BY SOME GOVERNMENT DEPARTMENTS WITH 'ENVIRONMENT-RELATED' ACTIVITIES

Departments/Agencies	Type of EIA projects	Form of participation
• Klang Valley Secretariat	Housing.	Provides comments to DOE.
• Aboriginal Affairs Department	Agriculture, Forestry.	Provides information, advice and comments.
• Federal Land Development Authority.	Land settlement.	Provides information.
• Marine Department.	Port construction.	Provides information.
• Penang Port Commission.	Container terminal.	Provides information.
• Ministry of Works [Highway Planning Unit]	Highway planning.	As EIA team member.
• Public Water Supply Department.	University campus planning; construction of dams; waste management centre.	Provides comments to DOE, information; as member of Review Panel; member of EIA teams.
• Public Works Department [Road Design and Research]	Road construction.	Provides information.
• Public Works Department [Airports].	Airport planning.	Provides information, advice and comments to DOE.
• Forestry Department.	Golf course; quarry; industry; housing; recreation.	Provides comments to DOE; member of Review Panel.
• National Petroleum.	Onshore exploration and drilling, gas-separation plant; other oil-relate	EIA team members.
• National Energy Board	Power stations; airports, tourism, etc.	Provide advice and comments to DOE.
• Agriculture Department.	Gas utilisation project; roads and highways.	Provides advice and comments to DOE; member of Review Panel.
• Veterinary Services Department	Pig farming.	Provides advice; EIA team member.
• Drainage and Irrigation Department.	Recreation; industry; university planning.	Provides comments to DOE.
• Muda Agricultural Development Authority.	Pesticides and siltation.	Provides information; EIA team member.
• Fisheries Development Institute.	Petroleum Refinery; Container Terminal; Mini Port.	Provides comments to DOE.
• Agricultural Research and Development Authority	Land use changes.	Provide information; EIA team member.
• Johor State Economic Development Corporation.	Industrial developments.	Provide information and advice.
• Museums Department.	Hydro-electric projects.	Provide information; EIA team member.
• Agriculture University [Science and Environment].	Infrastructure; Land reclamation and development; Port dredging.	EIA team member.
• Agriculture University [Engineering].	Variety of projects.	Comments to Review Panel.
• National University [Public Health and Medicine].	Wastes collection and disposal.	EIA team member.
• National University [Geology]	Marine facilities; Petroleum Refineries.	EIA team member.
• Science University [Housing, Building and Planning]	Industries; Land reclamation; Fisheries.	EIA team member.

no attempt to conceptualize other government ministries or agencies as being an integral part of the data base, although EPU has connections with these agencies. There was also no plan for a nation-wide land information system, while physical planning data are considered as too detailed for an EPU data base. Nevertheless the system is anticipated to provide both SEPUs and local authorities a timely map production of local authority and urban boundary changes.

The FTCPD started experimenting with the GIS in 1989 with the use of a microcomputer. 'Pilot' projects include 'live' structure and local planning studies. To date the development of the GIS in the department is still in a preliminary stage. The use of remote sensing by the department is scarce relative to the use of aerial photographs. In a study to assist the FTCPD to establish an urban and regional information system, specifically a GIS use in structure plans and for a Physical Development Monitoring System, Bruijn [1991] proposes that a GIS database for structure plans in Malaysia should include, among others, the following map layers:

Topography
Geology
Soils
Natural resources
Hydrology
Land use
Land availability
Zoning
Projects
Statistical zones
Public transportation network
Industry point map
Commerce point map
Facilities point map
Water quality
Air quality
Noise
Slope
Erosion risk
Serviced by electricity
Serviced by water
Serviced by gas
Serviced by sewer
Drainage/floodrisk
Traffic network
Parking

The type of map layers that are proposed are very much related to the requirement for SEA and are therefore very encouraging for the future of SEA in land use planning. However, the timing of the realisation of this system is still uncertain.

12.7 OVERVIEW AND CONCLUSIONS

The review of existing institutional resources for the implementation of the proposed SEA [land use plans] has been carried out for five components: policy, legislation, machinery, personnel and information. Although the expensive task of introducing SEA in land use planning is acknowledged in section 12. 6 [Information], no detailed review of financial resources has been made. This is due to the fact that no justifiable estimate on the cost of data collection for SEA in general or on natural environmental stock [for sustainable development planning purposes] in particular has been made. A search for a typical cost in the UK has also failed to produce an estimate. Without this estimate it is not possible to gauge the capability of planning authorities and agencies to support the task of collecting additional

information for sustainable development purposes, or for SEA. With this setback defined, the following are conclusions derived from the review of the five resources identified in this chapter.

On the positive side, there is a clear manifestation of sustainable development objectives and strategy in the Malaysian national socio-economic policies. Sectoral policies and strategies reflect the twin goals of development and environmental conservation. Socio-economic targets are achievable within reasonable limits, although income gaps and economic imbalances are still wide. The National Conservation Strategy which is being formulated will provide the much-needed framework for resource planning and management at all levels. On the negative side, national policies and strategies are not specific in spatial or environmental terms, and priority areas are not clearly specified by location. The lack of spatial or physical planning input and information on natural capital stock is evident. There is no statement on an adopted approach for sustainable development, although there are indications of the 'sustainability limit' version. On public participation, there is no flexibility in the plans, since the policies are not open to suggestions or comments at all times.

From the review of national policies, it is concluded that there is a reasonably good socio-economic policy framework, but there are shortcomings in terms of spatial and environmental guidelines. This makes it difficult to achieve an effective functioning of the proposed planning system which requires that national policies, plans and programmes provide effective frameworks that can be translated into macro-scale resource management plans at the lower levels.

The review of the existing land use planning legislation reveals a possibility for the STCPD to be the responsible agency at the state level, and State Spatial Plans. There is no limitation to the inclusion of SEA in land use plans, and the provision for statutory public participation is an asset for SEA. On the negative side, there is no provision for national level land use planning or responsibilities. However, planning on a wider scale is not hindered by the planning act but by the local government system that is in operation. On the methodology, there is no provision for alternative strategies or actions for consideration. Based on the current legislation therefore, it is not possible to legally operationalise in total the proposals in Chapter 11. However a phased implementation through administrative means is possible.

On the machinery for land use planning with SEA, the FTCPD and STCPD have the organisational structure for implementing the proposals. However the FTCPD has no formal role in national development planning, as it only provides input to the EPU on matters which are related to spatial planning and urbanisation. This is reflected in the seemingly low

emphasis given to research and data bank by the FTCPD, as indicated by the small number of personnel allocated to these activities. Local authorities are ineffective as local planning authorities, although they have to play very critical roles in planning for sustainable development, as provided by Agenda 21 of the Earth Summit at Rio. Therefore the dependence on the FTCPD and STCPD in the preparation, monitoring and review of land use plans will likely remain for a long time. Although not categorically stated, and the departmental work programme does not indicate so, the commitment for planning for sustainable development is there. However it is expected that putting into practice the proposals in Chapter 11 would require tremendous effort and utilise enormous resources. Nevertheless the signs for improvement are apparent.

Like many other agencies, the DOE and other departments with 'environment-related activities' are short of professional and technical personnel. Therefore the source of scientists and environmental experts from the public sector who can be involved in SEA is rather small. Due to the relatively new establishments in the 'young' Malaysia, many personnel lack experience and exposure to latest developments in planning and managing environmental resources, as well as in technological breakthroughs. Given this situation, input from the private sector, of which there is a reasonable supply, is needed. The source of 'generalist managers' i.e. the TCPD, is also short of personnel, but the number of additional personnel that are expected, and the growing number of land use planners in the private sector, are encouraging. On the whole, although the current situation is not very good, with the expected increase in the number of personnel in DOE and TCPD especially, there is potential for SEA as an integral component of resource planning and management.

Information-wise, there is still a wide gap in data availability for SEA in particular, and for planning and monitoring sustainable development in general. To date there is no formal State of the Environment Report to act as a data base for background analysis. The lack of information does not make the integration of SEA in planning an easy task, and no doubt will incur significant financial resources in the process. Nevertheless there is potential for inter-agency cooperation and information exchange. On the use of GIS, the proposal for a Spatially Dis-aggregated Data-base for the purposes of National Spatial Planning at the EPU does not include other ministries or agencies as being integral parts of the data base system. The data base also does not include physical planning data, as they are considered too detailed for an EPU data base. On the other hand, the proposed types of map layers in the proposed GIS database for structure plans in Malaysia are very much related to the requirements for sustainable development and SEA. This is encouraging for the future of SEA in land use planning, although the timing of the realisation of this system is still uncertain.

From the above review of existing resources, it is concluded that despite shortfalls in the form and structure of national policies, land use planning legislation, land use planning and resource management machinery, availability of personnel and the availability of information, there is a potential for integrating SEA in land use planning in particular, and national development planning in general, for sustainable development.

Chapter 13

Strategy for actions

13.1 INTRODUCTION

This chapter concludes Part 3 i.e. Proposals for Malaysia, by proposing an outline of strategy for actions for the implementation of the proposals for an ideal SEA system for Malaysia in Chapter 11. The programme for actions in section 13.3.2 is not comprehensive nor conclusive, for the formulation of a detailed programme for actions for implementing the proposals is beyond the means of this research. However, the programme is sufficient to be the base upon which a more detailed programme and eventually a plan of action, could be developed.

The review of existing resources in Chapter 12 has identified opportunities and constraints that are faced by planning agencies, and therefore provides a more realistic foundation to the proposals for action. The list of immediate actions listed in section 13.3.3 is therefore considered realistic and can set the foundation for more advanced activities by the responsible agencies in the later phases in the programme of actions.

13.2 SCOPE FOR ACTIONS

The mechanics for the integration of Strategic Environmental Assessment [SEA] in Malaysian land use planning, has, by necessity, encompassed proposals which are beyond the confines of land use planning discipline and its related legislation, machinery and current roles and responsibilities. In fact the proposal for SEA in Malaysian land use planning will not be effective without the encompassing proposals which accompany it.

The proposed Ideal SEA system for Malaysia [see Chapter 11] is within a proposed national planning system which includes the following proposals at the various levels:

BY THE FEDERAL GOVERNMENT:

1. Adoption of the National Integrated Planning System as illustrated in Table 11.1, and the provision of all required legislative, political and administrative machinery that are necessary to implement the system at all levels of government and administration;

2. Adoption of the system of a 5-Year National Spatial Plan and the provision of all required machinery for its preparation and implementation at all levels of government and administration; and
3. Adoption of the SEA system for all policies, plans and programmes, and the provision of the required machinery for its implementation at all levels of government and administration.

BY THE STATE GOVERNMENTS:

1. Adoption of the National Integrated Planning System as illustrated in Table 11.1, and the provision of all required legislative, political and administrative machinery that are necessary to implement the system at the state and local levels;
2. Adoption of a system of Macro-Scale Resource Management Plans in the form of 5-Year State Economic Plans and 5-Year State Spatial Plans, and the provision of all required machinery for their preparation and implementation at the state and local levels; and
3. Adoption of the SEA system for all policies, plans and programmes, and the provision of the required machinery for its implementation at the state and local levels.

BY THE LOCAL GOVERNMENTS:

1. Adoption of the system of Micro-Scale Resource Management Plans in the form of Structure Plans, Local Plans and Implementation Plans which conform to the proposed National Integrated Planning System, and the provision of all required legislative, political and administrative machinery that are necessary to implement the system at the local level; and
2. Undertake all necessary actions to prepare all the required plans, and monitor and review them on the achievement of sustainable development objectives and principles.

BY THE GENERAL PUBLIC:

1. Develop their knowledge on the environment and concern for the environment and its effect on the welfare of current and future generations, as contained in the strategic imperatives for sustainable development; and
2. Provide input to all levels of government on matters related to development and environment, consonant with the requirements for planning for sustainable development.

With respect to land use planning, the review of existing resources in Chapter 12 has identified opportunities and constraints facing the implementation of the proposals,

specifically within the scope of national development policies, land use planning legislation, land use planning machinery, availability of personnel and availability of information. However the conclusion made is that despite the shortfalls, there is still a hope for integrating SEA in land use planning in particular, and in national development planning in general, for sustainable development. The critical requirement for enhancing the opportunities and overcoming the constraints is multi-agency cooperation and coordination and information exchange at all levels of governments and administration.

Given the magnitude of the tasks and actions, the implementation of the proposals cannot be undertaken by a single agency. There is a need for a strategy which involves all parties involved in planning and management of natural, man-made and human resources. Such a strategy should be comprehensive, and therefore is beyond the means of this thesis. However, an outline of such a strategy should provide the base for developing a comprehensive strategy by the relevant agencies. The Outline Strategy For Actions is illustrated in the next section.

13.3 OUTLINE STRATEGY FOR ACTIONS

The Outline Strategy For Actions for a National SEA System for Malaysia is described under the headings of Approach, Programmes for Action and Immediate Actions:

13.3.1 Approach

The proposals in Chapter 11 involve functions, roles and responsibilities of various organisations which are involved in national development planning and management. Therefore it will take a very long time before the system can be accepted and put into effect. The organisation structure of some government ministries and agencies need to be reviewed; some legislation may have to be amended; new personnel may have to be employed; and new government machinery may have to be created. All these need careful study and the results will take a long time to come into effect.

Given the importance of land use planning in the planning and management of resources for sustainable development, this thesis takes the stand that the land use planning agency should be the responsible agency to act as a catalyst. Being the proposed Responsible Agency for SEA for land use planning, it is also proposed that the Federal Town and Country Planning Department [FTCPD] be the catalytic agency which is responsible for initiating measures for putting into effect the proposals. By doing this, the proposed four functions of SEA in Malaysia, which are described in Chapter 11, could be achieved.

Given the above scenario, the proposals can only be implemented in an incremental manner. The realistic strategy to adopt is one of phased implementation approach over a span of several years. This phased implementation strategy is described in the next section.

13.3.2 Programme for actions

To formulate a full programme for actions is a big task which needs a full research by itself. However at this stage it is sufficient to provide an outline of the programme, sufficient to be the basis for the development of a full programme. As proposed in the previous section, the responsibility of putting this programme is given to the FTCPD. The programme outline is as follows:

PHASE 1: CONVINCING THE LAND USE AND SOCIO-ECONOMIC PLANNERS:

- Establish the role of planners towards sustainable development;
- Establish the workings of the national integrated planning system;
- Establish the concept of SEA in land use planning for sustainable development;
- Establish roles and responsibilities in SEA;
- Develop ideas through research;
- Disseminate ideas through public lectures, debates, seminars, courses;
- Build up the information base; and
- Undertake pilot project[s].

PHASE 2: CONVINCING THE DECISION-MAKERS AND POLITICAL MASTERS:

- Through public debates;
- Through inter-agency cooperation and coordination;
- Through international seminars, and workshops;
- Through pilot project[s]; and
- Develop the political will.

PHASE 3: DEVELOPING THE MACHINERY:

- Establish inter-agency functions, roles and responsibilities;
- Strengthen the organisation structure, personnel and financial capability of planning agencies;
- Strengthen the information base and information exchange; and
- Strengthen the departmental 'networking'.

PHASE 4: ESTABLISH THE NATIONAL INTEGRATED PLANNING SYSTEM:

- Reorganize the government machinery; and
- Operation of new functions, roles and responsibilities

13.3.3 Immediate actions

It is impossible at this stage to put a timing to the implementation phases in the programme of actions. However Phase 1 is without doubt the phase for immediate actions. Phase 1 is a huge task by itself, and will take a huge amount of effort, resources, will-power and, the most important of all, political-will. Land use planners have the important task of convincing the socio-economic planners that sustainable development could be achieved through the integration of land use planning with socio-economic planning in a process in which is integrated SEA . While establishing the process of integrating SEA in the planning process, below is a list of immediate actions that need to be addressed by land use planning agencies, following the review of existing resources in Chapter 12.

NATIONAL POLICIES:

- There is to be an official declaration of a definition of sustainable development, and the adopted operational version for its measurement and implementation.
- There is to be a definition of achievable socio-economic targets, in which there is a balance between development goals and environmental conservation.
- There is to be a final National Conservation Strategy to guide the management of natural resources.
- There is to be specific identification of national policies and strategies in spatial and environmental terms.
- There is to be equal if not more emphasis given to spatial or physical planning input as well as information on natural capital in national development planning, relative to socio-economic planning input.

LAND USE PLANNING LEGISLATION:

- STCPD, as the Secretariat to the State Planning Committee [SPC] is to develop itself as a Responsible Agency for SEA [Land Use Plans] at the state level.
- STCPD, as the Secretariat to the State Planning Committee [SPC] is to fully perform its functions and roles as provided by the act, particularly on information gathering and development of planning methodologies.
- STCPD, as the Secretariat to the SPC, is to initiate the preparation of the State Spatial Plan.
- STCPD, as the Secretariat of the SPC, is to initiate and coordinate information gathering, planning, monitoring and review of sustainable development targets at the local planning levels.
- Local planning authorities, as provided by the Act, are to gather information, plan, monitor and review the achievements of sustainable development.

MACHINERY:

- FTCPD is to pursue its proposal for the establishment of the National Physical Planning Council [NPPC] with itself as the Secretariat.
- FTCPD, in its administrative capacity, is to develop itself as the Responsible Agency for SEA [Land Use Plans] at the Federal level.
- FTCPD is to develop its corporate planning functions and data bank and research activities in line with its proposed role as the Responsible Agency for SEA [Land Use Plans] and the role of land use planning in sustainable development.
- FTCPD, in its administrative capacity as adviser, coordinator and initiator of land use planning activities at the Federal level, is to develop guidelines and methods in planning for sustainable development in general, and the development of SEA in particular.

PERSONNEL:

- Departments with 'environment-related activities' which are facing acute personnel shortage, particularly FTCPD, STCPD, DOE and local authorities, are to convince the Public Services Department on the need for additional personnel for planning for sustainable development objectives, and to develop their personnel training programmes.
- There is to be more cooperation between government personnel, academicians and private sector personnel in activities related to planning for sustainable development in general, and SEA in particular.

INFORMATION:

- STCPD, as the Secretariat to the SPC, is to initiate and coordinate the preparation, monitoring and continuous review of the State of the Environment Report at the State and local levels.
- FTCPD, in its administrative capacity, is to coordinate the above activity.
- FTCPD is to develop its data bank and advance its development of the GIS within the department for its use as well as for the use of other planning agencies for sustainable development.

13.4 CONCLUSIONS

Establishing a National Integrated Planning System which also integrates within it the SEA system is a huge task, particularly when it involves the whole national government machinery. The integration of SEA within the land use planning process alone is a relatively simpler exercise, although it is not as effective on its own. However, following the principle of phased

implementation, the problems of developing a new national planning system should not be allowed to delay the integration of SEA in land use planning.

To put the proposals into action, the FTCPD is to be the catalyst to initiate Phase 1 of the strategy for actions. In the meanwhile, the list of immediate actions identified in section 13.3.3 should put all parties along the path towards sustainable development.

Chapter 14

The Final Conclusions

Chapter 14 FINAL DISCUSSION AND CONCLUSIONS

Chapter 14

Final discussion and conclusions

14.1 CONCEPTS AND PROPOSALS

Explicit throughout the thesis is the goal for sustainable development. This is the underlying principle behind the proposal to integrate Strategic Environmental Assessment [SEA] into Malaysian land use planning, which is the aim of this thesis. Also explicit is the importance of defining philosophies, concepts and principles which determine procedures and processes. The adopted approach to sustainable development determines the degree of importance given to the stock of natural environment, and hence the degree of importance that should be attached to it in land use planning. The importance of environmental conservation determines the need for 'policing' the utilisation of natural resources, and hence the importance of assessing impacts of development activities on the environment.

It is also apparent that land use planning cannot be separated from national development planning. Therefore integrating SEA into the land use planning process cannot be instituted in isolation because land use planning is only one level of planning in the whole planning system for social and economic changes. Links between land use planning and socio-economic planning and their positions in national planning systems need to be defined. For these reasons, the proposal to integrate SEA into Malaysian land use planning adopts the wider and more holistic approach. This is reflected in the contents of the thesis which explores the rationale of the proposal by examining philosophies, principles, procedures and processes of concepts which are closely linked to land use planning and SEA - sustainable development and EIA - and the common framework which encompasses them i.e. the national planning system.

Part 1 [The Conceptual Framework] defines the principles and key conceptual issues which justify the integration of SEA into Malaysian land use planning. Chapter 2 [Sustainable Development] defines the sustainable development approach that is appropriate for a country like Malaysia and hence determines the planning and environmental management approach that it should adopt. Chapter 3 [Land Use Planning] defines the suitable land use planning model that is appropriate in planning for sustainable development, and establishes the

importance of integrating a systematic process of assessing environmental impacts in the land use planning process. Chapter 4 [EIA and SEA] identifies the limitations of project-level EIA and defines the framework for assessing environmental impacts in planning for sustainable development, in the form of SEA for policies, plans and programmes at all levels of governments. Chapter 5 [Planning for Sustainable Development] identifies some approaches to planning for sustainable development at the national level in the ESCAP Region, which form more appropriate models for a developing country like Malaysia. Chapter 6 [Key Conceptual Issues] identifies the key conceptual issues which form the framework and justify the proposals for Malaysia.

Part 2 [The Malaysian Framework] defines the Malaysian planning and EIA systems and highlights opportunities and constraints facing the country in the path towards sustainable development. Chapter 7 [Malaysian National Planning System] defines the Malaysian national planning policies and strategies towards sustainable development and the role and limitations of land use planning in the national planning system. Chapter 8 [Malaysian Land Use Planning] defines the land use planning system and its role in planning for sustainable development, and identifies the potential for integrating SEA into the planning process. Chapter 9 [Malaysian EIA] identifies some experiences from the development of EIA in Malaysia that could be used as lessons in integrating SEA into land use planning, and the potential for SEA. Chapter 10 [Key Malaysian Issues] summarises the key Malaysian issues which justify and form the framework for the proposals for Malaysia in Part 3.

Part 3 [Proposals for Malaysia] outlines the proposals. Chapter 11 [Aiming Towards the Ideal] defines the underlying philosophy, criteria and assumptions for the ideal national planning system in which SEA is integrated. This national planning system is the framework for the SEA process, roles and responsibilities, and methodological guidelines that are proposed for land use planning in particular and for other forms of SEA in general. Chapter 12 [Review of Existing Resources] defines opportunities and constraints with respect to national policies for social and economic changes, planning legislation, institutional machinery, and availability of personnel and information. Chapter 13 [Strategy for Actions] defines the scope for actions, outline of strategy for actions and a list of immediate actions to be taken for the integration of SEA in land use planning, and subsequently in all types of planning.

It is clear from the research that sustainable development,socio-economic planning, land use planning and impact assessment cannot be treated in isolation. They form the integral links which form the framework for national planning systems and processes. These links are examined in the next section.

14.2 THE INTEGRAL LINKS

Explicit throughout the thesis are integral links between sustainable development, land use planning and impact assessment, as well as between socio-economic and land use planning within the context of national development planning. These links are defined through the examination of concepts as well as in the examination of the Malaysian planning and impact assessment frameworks, and are acknowledged and embedded in the proposals made for Malaysia. The sections below reiterate these integral links.

14.2.1 Sustainable development, land use planning and impact assessment

Having as its moral principle the concern for present poverty and the welfare of present and future generations, sustainable development stresses the interdependence of development and environmental conservation. Having opted for the strong sustainability concept through the 'communalist approach' i.e. having more direct regulation and planning of resources, the chosen version for its operation in Malaysia is the 'sustainability limit' version. This version requires that while development is necessary to raise the standard of living and quality of life of the population, it should also be limited by the carrying capacity of the environment. This approach requires a strong information base on the stock of natural environmental resources, and a strong knowledge of the functions of natural resources, both of which are still currently lacking in Malaysia. However, the 'sustainability limit' version is still operational if environmental conservation, which is a basis of the precautionary principle, is practised.

Having opted for environmental conservation, there is a strong need for rational planning and management of environmental resources, because it involves making choices and decisions on the multiple uses of limited resources. This goes beyond the application of abstract scientific criteria and apolitical rational grounds, but also relies on value judgments which relate to what decision-makers consider as desired objectives, or should be. Being a multi-dimensional, multi-objective, multi-disciplinary and multi-decision-making activity and process, land use planning is the appropriate tool to help to make those decisions. The fact that decision-making in land use planning is also inclined to rely on value judgements makes the link between sustainable development and land use planning closer.

The rational-comprehensive planning approach is the best planning approach for sustainable development. This is because the approach adopts planning by creating a desired future. It decides on the desired future [sustainable development] and allocates resources so that trends are changed or created accordingly, based on present, predicted or new values. However the problem with the rational planning model which relies on

comprehensiveness is the huge amount of data needed to formulate and evaluate numerous alternatives, a requirement which currently cannot be met in Malaysia. The solution to this limitation is the 'mixed scanning paradigm' approach, which is a comprehensive examination of parts of the system, and an incomplete review of the rest. This approach requires less data than the full rational-comprehensive model, and therefore is more pragmatic for Malaysia.

Making choices on the use of resources involves a well-informed decision-making process. It needs a 'policing' mechanism to assess whether or not policies, plans and programmes could be termed as contributing towards sustainable development or 'unsustainable development' instead. In addition, it requires monitoring of sustainability by evaluating impacts of development on natural resources, particularly on the carrying capacity of the ecosystem. The integration of impact assessment in land use planning is a proactive approach in which the requirement for sustainability is the driving consideration and the permissible level of economic activity is the dependent variable.

Integrating impact assessment in land use planning also helps to overcome shortcomings of project level EIA which is generally reactive, overlook impacts from ancillary developments, overlooks cumulative environmental effects and impacts, forecloses alternatives, does not look at objectives and only looks at a narrow spectrum of issues. SEA accommodates the new EIA framework for sustainable development: anticipatory and preventive; more problem-focussed and value-based; links policy, planning and assessment and management; focuses on cumulative impacts; limits development within the regional carrying capacity; increases public participation; and improves the contents of environmental impact assessments to include global environmental problems like global warming and loss of biodiversity.

The integral link between sustainable development, land use planning and impact assessment is incorporated in the proposals for Malaysia. The importance of the link is clearly defined in the four functions of Malaysian SEA, namely [1] to promote the management of environmental change; [2] to promote planning for sustainable development; [3] to promote a well-informed decision-making in the planning process; and [4] to overcome the shortcomings of project EIA. The proposed Malaysian National Planning System integrates within it land use planning which assists in planning of national plans, policies and strategies, and in macro- and micro-scale resource management plans. Integral in the system is SEA for policies, plans and programmes at all levels of government, to ensure that proposals for development do not result in irreversible adverse impacts, and mitigation measures are enforced from the early stages of the development process.

The above link between sustainable development, land use planning and impact assessment justifies and forms the basis for the integration of SEA in land use planning, as exemplified by the proposed SEA [Structure Plan] process and methodological guidelines in this thesis. The outline strategy of actions in the previous chapter is therefore also justified.

14.2.2 Socio-economic and land use planning

With respect to sustainable development, the socio-economic planning goal is normally the achievement of sustainable economic development i.e. achieving quality of life by raising the material standard of living of the poor and this can be quantitatively measured in terms of increased food, real income, educational services, health-care, sanitation and water supply, emergency stocks of food and cash, etc. Although lately more socio-economic plans have incorporated spatial elements, they are generally lacking in spatial specifications and deficient in environmental considerations. In the UK, the government has encouraged government departments to include environmental appraisal of policies, plans and programmes, but this is still insufficient in terms of specific locations and environmental impacts. In Malaysia the 5-Year Malaysia Plans, which are socio-economic plans, are very deficient in spatial and environmental components. If this planning concept continues, it is difficult to see how sustainable development [epitomised by the environmental conservation approach] can be achieved.

In the idealized framework for strategic planning and implementation in the public sector, land use planning is considered as part of a strategic planning process which aims towards securing social and economic change, since the goal of development involves some form of physical development. In this framework, land use planning integrates, coordinates, and is part of interrelated activities which operate in different areas [housing, health, etc], at different levels [national, regional, local], and through different agencies [ministries, local authorities, etc]. Land use planning gives physical expressions to socio-economic policies e.g.. housing, health, education, employment, etc.]. This functional role of land use planning is performed by the translation of general sectoral policies in a wide range of areas into more detailed plans and proposals, which eventually lead to physical development on the ground. The strategic planning framework therefore defines socio-economic planning and land use planning as two types of planning which contribute towards the achievement of social and economic change, and have to subsist together.

While the strategic planning framework determines the vertical links between socio-economic planning and land use planning, resource integrated planning and management determines vertical and horizontal integration between the two types of planning. By combining the two approaches, socio-economic planning and land use planning ensures

effective planning and management of resources at every level of planning while achieving socio-economic objectives for environmental change at every level. The integration between socio-economic planning which stresses economic development objectives, and land use planning which is more concerned with the environment, will ensure that the interdependence of development and environmental conservation, which is the principle of sustainable development is maintained.

The above integration between the two types of planning is incorporated in the proposed national planning system for Malaysia in Chapter 11. While land use planning is only one level of planning in the strategic planning framework, the proposal for Malaysia ensures that land use planning appears at all levels of planning, i.e. at the national plans, policies and strategies level, macro-scale resource management plans level, and micro-resource management plans level. This system is perceived to be more effective as there is provided a system of checks and balances at every level of planning and management of environmental resources. To facilitate these checks and balances, different forms of SEA , which are proposed for the various types of policies, plans and programmes at all levels of planning and management, perform the 'policing' role.

The system of integrating socio-economic planning with land use planning justifies and forms the basis for SEA in land use planning in Malaysia. The operation of the system and process, and the outline strategy for actions therefore require cooperation among all agencies involved in these two forms of planning.

14.3 SUMMARY OF PROPOSALS FOR MALAYSIA

Based on the principles which have been derived from the research, as described in the previous section, following is a summary of proposals which have been formulated for Malaysia:

1. FUNCTIONS OF MALAYSIAN SEA:

To promote the management of environmental change;

To promote planning for sustainable development;

To promote a well-informed decision-making in the planning process; and

To overcome the shortcomings of project EIA.

2. THE MALAYSIAN NATIONAL PLANNING HIERARCHY:

CONCEPT	National integrated resource planning and management
NATIONAL GOAL:	Rukunegara [National Ideology]

RESOURCE PLANNING & MANAGEMENT LEVELS:	
Level 1: National Planning	National plans, policies, strategies
Level 2: Regional resource allocation and integration	Macro-scale resource management plans
Level 3: Local Impact Minimisation	Micro-scale resource management plans
Level 4: Implementation:	Implementation, monitoring, review

3. MALAYSIAN HIERARCHY OF SEA:

Forms of SEA	Main Area of Analysis
NATIONAL PLANNING:	
• SEA [National Policies] • SEA [National Spatial Plan] • SEA [National Sectoral Policies]	- Plans, policies, and strategies to achieve national goal. - Assessment of spatial environmental [ecological] benefits - Strategy of action: goal, objectives, strategies, policies
REGIONAL RESOURCE ALLOCATION & INTEGRATION:	
• SEA [State Economic Plan] • SEA [State Spatial Plan] • SEA [Programmes]	- Choice of alternatives in resource exploitation & development geared to conservation & preservation imperative to maintain a balance between natural amenities & man-made goods and services.
LOCAL IMPACT MINIMISATION:	
• SEA [Structure Plan] • SEA [Local Plan]	- Spatial alternative development strategies. - Sites or localities suitability to defined category of development. - Suitability to localities or sites.
IMPLEMENTATION:	
• SEA Audits	- Linked series or actions. - Include impacts of projects

4. ROLES AND RESPONSIBILITIES FOR SEA [LAND USE PLANS]

Roles	SEA [Land Use Plans]
Initiator	FTCPD for NSP; STCPD for SSP; LPA for structure and local plans.
Assessor	Planning teams responsible to the initiator.
Consultation and Public Participation	FTCPD for NSP; STCPD for SSP; LPA for structure and local plans.
Review Panel	Appointed by FTCPD for NSP and SSP. Appointed by SPC for structure and local plans.
Approving Authority	NPCC for NSP and SPP; SPC for structure & local plans.
Responsible Agency	FTCPD.

Note:
NSP = National Spatial Plan NPCC = National Physical Planning Council
SSP = State Spatial Plan SPC = State Planning Committee
SPC = State Planning Authority LPA = Local Planning Authority
FTCPD = Federal Town and Country Planning Department.

5. PROGRAMME FOR ACTIONS:

At this stage, the research is only sufficient to provide an outline programme for actions. However, it is adequate to be the basis for the development of a full programme. The responsibility of putting the programme into action is given to FTCPD.

PHASE 1: Convincing the land use planners and socio-economic planners.
PHASE 2: Convincing the decision-makers and political masters.
PHASE 3: Developing the machinery.
PHASE 4: Establish the national integrated planning system.

14.4 FURTHER RESEARCH AND DEVELOPMENT

The research on the integration of SEA into Malaysian land use planning has been undertaken in a comprehensive approach. However it is by no way exhaustive. To put into effect the proposals that have been made in this thesis, there are still some areas of concern that need to be explored. Below is a list of subjects for further research and development. The list is grouped according to the instruments for environmental action:

NATIONAL PLANNING SYSTEM

- At the national level, a research to develop a system for developing a 'green' System of National Account [SNA] for Malaysia, in order to include accounting for the volume of stocks and flow of natural resources in the national account. This is one approach for calculating sustainable income, which is defined as 'green' Net National Product in the UK example. The system should be able to be filtered down to regional/state and local planning levels.

- In relation to the above, research to develop guidelines and techniques on valuing natural environmental stock for the purpose of measuring sustainable development, and for the development of Cost Benefit Analysis which takes into consideration values of natural environmental stock.

LAND USE PLANNING SYSTEM

- On the operations side, a research on procedures, methods and techniques for undertaking land use planning with SEA, including guidelines for assessing impacts, information gathering, and the form and content of land use plans with SEA. The results can be published in the form of a Handbook.

- A research to determine data requirements for SEA, to develop a comprehensive and functional data bank with the complement of a GIS, so as to facilitate effective functioning of SEA.

- Research on land use planning criteria for sustainable development and develop indicators of quality of life which are to be used as planning standards.

- Research on a system of monitoring and review of land use plans by the use of sustainable development indicators.

- Research on SEA methods for assessing impacts of sectoral components of strategic land use plans e.g. impacts of transportation strategies, plans and programmes within the context of land use plans.

NATURAL RESOURCES AND IMPACT ASSESSMENT

- Research on the determination of carrying capacities, to develop guidelines and techniques ensuring that developments do not exceed carrying capacities, as required by the 'sustainability limit' version of sustainable development.

- Research to develop the approach, process and methodological guidelines for SEA of other policies, plans and programmes [socio-economic PPPs] in the national system of SEA proposed in this thesis.

LEGISLATION

- Review the Town and Country Planning Act 1976 [Act 172] for the possible inclusion of a requirement for SEA in the preparation of Development Plans, as well as the role of planning at the federal level of government.

- In view of the proposal for SEA, the Environmental Quality Act 1974, Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order 1987 needs to be reviewed, particularly on the identification of the prescribed activities and their thresholds.

INSTITUTIONS AND TRAINING

- Research for the development of an organisational system which provides effective vertical and horizontal links between all agencies which are involved in national development planning [socio-economic and land use planning] within the context of the proposed national integrated planning system for resource planning and management.

- In view of the concern for sustainable development, the FTCPD, the Malaysian Institute of Planners and local universities are to carry out a joint research for an appropriate land use planning curriculum which is in line with current concerns and roles of land use planners in planning for sustainable development.

- The National Institute of Public Administration [INTAN], together with the Town and Country Planning Department and the Department of Environment, to carry out a research for the development of an effective training programme for all parties who will be involved in SEA.

PUBLIC PARTICIPATION

- Research for the development of an effective system of increasing public awareness on the environment and sustainable development, as well as increasing the level of consultation and public participation in the planning process.

14.5 CONCLUSIONS

By examining the principles and processes of sustainable development, land use planning, strategic environmental assessment and national planning approaches for sustainable development, the research has justified and provided the framework for integrating SEA into land use planning in Malaysia. Also by necessity, the thesis has included the proposal for a National Integrated Planning System in which the land use planning system is embedded, and in which the hierarchy of SEA is integrated. These proposals are in line with the holistic approach to land use planning which aims towards sustainable development.

The outline strategy for action, and the programme for immediate actions are for the immediate operation of the proposals. However these would not be complete without research and development on subjects which are listed in section 14.4. These subjects for research are integral components of an effective system of planning for sustainable

development in Malaysia. The list is not comprehensive but is adequate for at least the first round of further research, which should be in line with the programme for immediate actions.

Appendices & References

APPENDIX A

THE DEVELOPMENT OF A PLAN EIA METHOD FOR MALAYSIAN LAND USE PLANNING
PH.D RESEARCH AT THE TOWN & COUNTRY PLANNING DEPARTMENT, UNIVERSITY OF NEWCASTLE UPON TYNE, UNITED KINGDOM

INFORMATION AVAILABILITY SURVEY

AGENCY:

SURVEY REFERENCE.:

A.TYPES OF ENVIRONMENTAL DATA

1. According to the "Handbook of Environmental Impact Assessment Guidelines" of the Department of Environment Malaysia, your agency conducts environmentally-related activities, and is one of the sources of information for environmental impact assessment activities.

Please provide more details of your information by completing **FORM PQS-M-1**

B.PARTICIPATION IN EIA

2. Does your agency have personnel who have been trained in EIA? YES / NO

If YES, please complete **FORM PQS-M-2.**

FORM PQS-M-2

A QUALIFICATION	B TRAINING INSTITUTION	C NO.OF OFFICERS	D REMARKS

Instructions:
Column A: Write "Degree", "Diploma", "Certificate", or "In-service training". Write in full if "Others".
Column B: Write full name of training institutions.
Column C: Write total numbers of officers.
Column D: Write any remarks if necessary or appropriate.

3. Does your agency have a training programme for EIA? YES / NO

If YES, please describe your training programme below:

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

HJH HALIMATON SAADIAH BTE HASHIM
POSTAL ADDRESS: 72 JALAN SETIABAKTI, BUKIT DAMANSARA, 50490 KUALA LUMPUR, MALAYSIA. TEL: 03-2561871. FAX: 03-2552017.

4. Has your agency participated in EIA projects? YES / NO

If YES, please complete **FORM PQS-M-3** below:

FORM PQS-M-3

A NAME OF PROJECT [S]	B LEAD AGENCY	C FORM OF PARTICIPATION	D REMARKS

Instructions:
Column A: Please write the name of project[s] in full.
Column B: Please write name of government agency or developer responsible for the EIA.
Column C: Please write "1" if "provide information".
"2" if " provide advice".
"3" if "member of EIA Review Panel".
"4" if "member of EIA Team".
"5" if "provide comments to DOE".
"6" if "provide advice to local planning authority"
combination of above answers if applicable.
Column D: Please write any remarks if necessary or appropriate.

C. GENERAL

5. What aspects of your programmes and activities do you consider relevant in Project or Plan EIA?

.....

.....

.....

.....

.....

Are you willing to participate in a telephone interview on the above subjects? YES / NO

Person who administers the questionnaire:-

NAME:.....

POST:.....

TELEPHONE:.....DATE:.....

THANK YOU VERY MUCH FOR YOUR COOPERATION.
PLEASE RETURN THE QUESTIONNAIRE IN THE STAMPED SELF-ADDRESSED ENVELOPE WHICH IS ENCLOSED.

HJH HALIMATON SAADIAH BTE HASHIM
POSTAL ADDRESS: 72 JALAN SETIABAKTI, BUKIT DAMANSARA, 50490 KUALA LUMPUR, MALAYSIA. TEL: 03-2551871. FAX: 03-2562017.

FORM PQS-M-1

[A] TYPE OF DATA	[B] CATEGORIES OF CLASSIFICATION	[C] AREA COVERAGE	[D] MAP SCALE	[E] REGULATION STANDARDS	[F] REGULATION LEGISLATIONS	[G] ENVIRONMENT POLICY	[H] REMARKS

Instructions:

Col.A.Please write the general types, e g. soil classification, crop types, educational facilities, land use patterns.

Col B.These are the classifications within each type of data e.g. the types of crops, types of land use..

Col C:Write 1 for Nation-wide
2 for State-wide
3 for District-wide
4 for Mukim-wide
5 for Project-areas

Col.D: Write the appropriate scale of map if available.

Col.E: Write 1 if there is standard for regulation
2 if there is no standard for regulation.

Col F: Write 1 if there is environment-related policy
2 if there is no environment-related policy.

Col.G: Write 1 if there is legislation for regulation purposes
2 if there is no legislation for regulation purposes.

HJH HALIMATON SAADIAH BTE HASHIM
POSTAL ADDRESS: 72 JALAN SETIABAKTI, BUKIT DAMANSARA, 50490 KUALA LUMPUR, MALAYSIA. TEL: 03-2551871. FAX: 03-2552017.

APPENDIX B:

INFORMATION AVAILABILITY SURVEY LIST OF RESPONDENTS AND NON-RESPONDENTS [AUGUST - OCTOBER 1992]

RESPONDENTS	NON-RESPONDENTS
National University [Geology]	Malayan University [Geology]
National University [Health and Medicine]	Malayan University [Economics]
Science University [Housing, Building & Plng	Science University [Sch. of Chemistry]
Marine Department	Science University [Sch. of Physics]
Agriculture University [Engineering]	Technology University [Urban and
Public Works [Design, Research and Road]	Regional [Planning]
Agriculture University [Science & Environment]	Fed. Land Consolidation and Rehabilitation
Fed. Land Development Authority	Malaysian Industrial Development Authority
MUDA Agriculture Development Authority	Malaysian Highway Board
National Energy Board	Min. of Housing and Local Government
Palm Oil Research Institute of Malaysia	[Technical Division]
National Petroleum [Marine]	Ministry of Health [Engineering Services]
Pahang Tenggara Development Authority	Standards Industrial Research Institute
Klang Valley Planning Secretariat	Meteorological Department
Forestry Department	Factories and Machinery Department
National Housing Department	Kuala Lumpur City Hall [Planning
Public Works Department [Water Supply]	and Development Control]
Public Works Department [Airport]	Federal Land and Mines Department
Land and Mines Department [Fed. Territory]	Economic Planning Unit
Museums Department	Malaysian Fisheries Department
Survey and Mapping Department	Malaysian Fisheries Development Authority
Fisheries Research Institute	Geology Department
Rubber Research Institute of Malaysia	Ministry of Health [Public Health]
Highway Planning Unit	Statistics Department
Malaysian Agricultural Development Authority	Civil Aviation Department
Kuala Lumpur City Hall [Planning]	Malayan Railway Administration
Johor State Public Works Department	Forestry Research Institute Malaysia
Fed. Town and Country Planning Department	Johor State Mines Department
Johor State Economic Devt. Corporation	Johor State Veterinary Department
Department of Environment Malaysia	Johor State Geology Department
Malaysian Agriculture Department	Johor State National Energy Board
Drainage and Irrigation Department	Johor Bahru Municipal Council
Malaysian Veterinary Department	Johor State Fisheries Department
Malaysian Wild Life Department	Johor Tenggara Development Authority
Klang Port Authority	Johor Bahru District Office
Urban Development Authority	Malaysian Mining Department
Implementation and Coordination Unit	
Socio-Economic Research Unit	
Aboriginal Affairs Department	
Penang Port Commission	
Kuantan Port Authority	
Malaysian Timber Industry Board	
Tin [Research and Development] Industry Board	
Johor Town and Country Planning Department	
Johor State Forestry Department	
Johor State Agriculture Department	
Johor State Health Department	
Johor State Land and Mines Department	
Johor State Water Department	

APPENDIX C:

EIA INVOLVEMENT BY MALAYSIAN GOVERNMENT DEPARTMENTS [INFORMATION AVAILABILITY SURVEY - A POSTAL QUESTIONNAIRE SURVEY, AUG - OCT. 1992]

No	Questionnaire Question Nos. / AGENCIES	A		B2		B3		B4		C	
		Environ-mental Data		EIA trained Officers		EIA Trai-ning Pro-gramme		Partici-pated in EIA		Rele-vance to EIA	
		Y	N	Y	N	Y	N	Y	N	Y	N
	PRIME MINISTER'S DEPARTMENT										
1	Coordination & Implementation Unit		•		•		•		•		•
2	Klang Valley Planning Secretariat		•		•		•	•		•	
3	Socio-Economic Research Unit		•		•		•		•	•	
	MINISTRY RURAL DEVELOPMENT										
4	Aboriginal Affairs Dept.		•		•		•	•		•	
5	Fed. Land Devt. Auth. [FELDA]		•		•		•	•		•	
6	Pahang Tenggara Devt. Auth [DARA]		•		•		•		•	•	
	MINISTRY OF TRANSPORT										
7	Marine Dept.		•		•		•	•		•	
8	Klang Port Auth.	•			•		•		•	•	
9	Pulau Pinang Port Commission		•		•		•	•		•	
10	Kuantan Port Auth.	•			•		•		•	•	
	MINISTRY OF WORKS										
11	Highway Planning Unit	•			•		•	•			•
12	Works Dept.[Water Division]	•		•		•		•		•	
13	Works Dept.[Road Design & Research]		•		•	•		•		•	
14	Works Dept.[Airports]		•		•		•	•		•	
15	Works Dept.[Johor State]		•		•		•		•		•
16	Water Dept.[Johor State]		•		•		•		•	•	
	MINISTRY OF PRIMARY INDUSTRIES										
17	Forestry Dept.	•			•		•	•		•	
18	Wood Industry Auth.		•		•		•		•		•
19	Tin Industry Research & Devt. Auth.		•		•		•		•	•	
20	Palm Oil Research Institute [PORIM]		•		•		•		•		•
21	Forestry Dept. [Johor State]	•			•		•		•		•
22	National Petroleum [PETRONAS]	•		•		•		•		•	
	MIN. OF ENERGY,TELECOM,POST										
23	National Energy Board		•	•			•	•		•	
	MIN. OF LANDS & COOPERATIVES										
24	Survey & Mapping Dept.		•		•		•		•		•
25	Land & Mines Dept. [Federal Territory]		•		•		•		•		•
26	Land & Mines Dept. [Johor State]		•		•		•		•		•
	MINISTRY OF AGRICULTURE										
27	Agriculture Dept.	•		•		•		•		•	

APPENDIX C: [CONT.]

No	Questionnaire question numbers / AGENCIES	A Environ-mental Data		B2 EIA trained Officers		B3 EIA Training Programme		B4 Partici-pated in EIA		C General Comments	
		Y	N	Y	N	Y	N	Y	N	Y	N
28	Veterinary Services Dept.	•			•		•	•		•	
29	Drainage & Irrigation Dept.		•		•		•	•		•	
30	Muda Agricultural Devt. Auth.[MADA]	•			•		•	•		•	
31	Fisheries Research Institute [LKIM]		•		•		•	•		•	
32	Agric. Research & Devt. Auth.[MARDI]	•		•			•	•		•	
33	Rubber Research Institute [RRI]		•		•		•		•		•
34	Agriculture Dept. [Johor State]		•		•		•		•		•
	MIN. OF SCIENCE, TECH, & ENVIRON.										
35	Environment Dept.	•		•		•		•		•	
36	National Parks Dept. [PERHILITAN]	•		•			•	•		•	
	MINISTRY OF PUBLIC ENTERPRISE										
37	Urban Devt. Auth.[UDA]		•	•			•		•	•	
38	State Economic Devt. Corp. [Johor state]	•		•			•	•			•
	MINISTRY OF HOUSING & LOCAL GOVT										
39	National Housing Dept.		•		•		•		•	•	
40	Fed. Town & Country Planning Dept.	•		•		•		•		•	
41	Town & Country Planning Dept. [Johor St]	•		•			•	•		•	
	MIN. OF CULTURE, ARTS & TOURISM										
42	Museum Dept.	•			•		•	•		•	
	MINISTRY OF HEALTH										
43	Medical and Health Services Dept.[Johor]		•		•		•		•	•	
44	KUALA LUMPUR CITY HALL		•	•		•			•		•
	MINISTRY OF EDUCATION										
45	Agriculture Uni. [Sc. & Environ.]		•	•		•		•		•	
46	Agriculture Uni. [Engineering]		•		•		•	•		•	
47	National Uni. [Public Health & Medicine]		•		•		•	•		•	
48	National Uni. [Geology]	•			•		•	•		•	
49	Science Uni.[Housing, Building & Plng.]	•		•			•	•		•	
	TOTAL	19	30	14	35	8	41	29	20	36	13
	%	38.7	61.3	28.6	71.4	16.3	83.7	59.2	40.8	73.5	26.5

APPENDIX C: [CONT.]

Note:

Devt.	=	Development.	Uni.	=	University
Auth.	=	Authority.	Plng.	=	Planning
Min.	=	Ministry.			

A	The request is for details on availability of environmental information.
B2	The question is whether there are officers who have any training in EIA.
B3	The question is whether there is an EIA training programme in the department.
B4	The question is whether the department has participated in an EIA project.
C	The question is whether the department considers its activities to have any relevance to EIA.
Y	YES Positive answer
N	NO Negative answer

APPENDIX D

SUMMARY OF CONCLUSIONS FROM AN INTERNATIONAL WORKSHOP ON URBAN PLANNING AND MANAGEMENT IN RAPIDLY URBANISING COUNTRIES; SEPTEMBER 1989

CRITIQUE OF TRADITIONAL URBAN PLANNING PRACTICE

The "blue-print" from the Master Planning practice for the future development of the city is to limit its physical expansion while directing its growth; a principle which is impossible to maintain amidst fast-growing population, poverty and lack of resources. The following issues are pertinent:

- *Planners are not part of the local decision-making and management system for the city concerned.* Due to limited planners, urban planning function is located in the central ministry or, at the most, at regional level;
- *Delays in preparing and approving master plans* result in developments which do not conform to the plans, such as:
  - the city's population has doubled in size during the time taken for plan preparation; and
  - the emergence of squatters settlements in the inner-cities and on the urban fringe;
- *There are limited resources for implementation* resulting in severe shortage of infrastructure and services;
- *Investments are drawn up without urban planners' involvement*, and without the benefit of the master plan;
- *The planning system is based directly on legislation in use [or rather, formerly in use] in a developed country.* The system which emphasises control on all land development does not fit in well with the rapidly-urbanising countries and fast-growing cities; and
- *Fast deteriorating environmental conditions in and around the city* , with high levels of atmospheric and water pollution, excessive extraction of ground water, uncollected domestic refuse, and untreated human waste and toxic industrial waste, and degradation of the surrounding land which is subject to speculation.

NEW APPROACHES FOR URBAN PLANNING IN THE 1990s

The sequence of the issues identified below range from the general context in which planning operates, to the nature of the planning process:

- *The city as the engine of economic development.* The role of urban management is to provide the necessary framework in which urban economic development can take place and to facilitate income-generating activities:
- *An environmentally conscious and sustainable system.* There is a need for positive urban management policies aimed at guiding development away from ecologically fragile areas and promoting environmentally sustainable development, either through the use of EIA in the planning system, or a greater awareness of environmental issues built into every stage of the planning process;
- *The balance between needs and resources.* An effective plan is realistic in terms of the likely population growth, available resources and affordability;
- *Working within the land market.* Public interventions in the land market can have disadvantageous effects for the poor. Selective land acquisition and management programmes are more effective than large scale public ownership of land, including land banking and land nationalisation. The key issue is to increase substantially the supply of accessible, serviced land, particularly to the poor;
- *The protecting and guiding functions of planning.* Planning is more effective if it seeks to guide the operations of the land market, rather than merely attempting to prevent development;
- *Protecting and enabling the poor.* This requires a greater awareness about the survival strategies of the poor, and about the complex pattern of effects [however unintentional] which may result from plans and policies;

- *A participatory approach.* Participation should lead to empowerment and results in an effective reallocation of the resources which the poor need. Different forms of participation are needed at different stages of the planning process.
- *Planning as a part of the urban management process.* The land use planner needs to be a full member of the management team responsible for the city, and has to be concerned with the operations of the various markets for land, housing and labour. Planners must be in the political process of decision-making, providing appropriate technical advice on the available options;
- *Developing a locally relevant strategic planning framework.* Planning approaches must be designed to meet the particular economic, social, political and cultural situation of the country and locality concerned. Where there is shortage of planners [which is common], the practice of "action planning" is required;
- *The institutional framework for planning.* Legislative reforms should be tailored precisely to local situations;
- *Urban planning and management as a five-finger exercise.* A multi-disciplinary team is needed to develop the information sources and analytical skills necessary to understand the processes and forces which are shaping the city, and to enable them to influence the effective decision-making process; and
- *Commitment, corruption and the work ethic.* There is a need for a reorientation of work attitudes of public servants towards a more innovative, proactive and performance oriented work ethic.

Summarised from Devas, 1989.

APPENDIX E

EIA PROJECTS PARTICIPATED BY SOME DEPARTMENTS/AGENCIES IN PENINSULAR MALAYSIA

AGENCIES & EIA PROJECTS	LEAD AGENCY	FORM OF PARTICIPATION	REMARKS
Klang Valley Planning Secretariat			
• Housing Development on lots 1141, 1254, 1324 & 362, Mukim Rawang, Daerah Gombak.	DOE/Sime Development. Sdn. Bhd.	Provides comments Provides comments	Comments on Policy aspects.
• Housing, Commercial, Recreational, Institutional and Industrial zone Development in Sg, Buloh, Mukim Petaling, Selangor.	Selangor State Development Corporation		Comments on Policy aspects.
Aboriginal Affairs Department			
• Provides view related to the Orang Asli [Aborigines] whenever required by certain projects which involve the Orang Asli.	All agencies involved in the planning and development which affect the Orang Asli.	Information, advice and comments	
Federal Land Development Authority [FELDA]			
• Sabah Land Settlement Project.	FELDA/Minconsult Sdn. Bhd.	Information	
Marine Department			
• Kuala Perlis Mini Port Construction.	Ikatan Cekap Sdn. Bhd.		
Pulau Pinang Port Commission			
• North Butterworth Container Terminal.	Penang Port Commission.		
Min.of Works [Highway Planning Unit]			
• Cameron Highlands-Kuala Lipis Highway, Pahang.	Highway Planning Unit	EIA Team member	
Works Department [Water Supply Branch]			
• International Islamic University Campus, Gombak, Selangor.	Education Ministry.	Comments to DOE.	
• Gemencheh Dam, Negeri Sembilan.			
• Kelinchi Dam, Negeri Sembilan.	JBA Negeri Sembilan.	Info. & Comments.	
• Raising of Sg. Lebam Dam, Johor.	JBA Negeri Sembilan.	Info. & Comments.	
• Kelantan Groundwater Supply.	Works Dept.[Water Branch].	Info. & Comments.	
• Bukit Nanas Waste Management Centre, Negeri Sembilan.	JKR Kelantan. DOE.	Info. & Comments. Review Panel, EIA Team & Comments	
Works Department [Road Design and Research]			
• Blau-Loging Road	Works Department	Information.	
Works Department [Airports]			
• New Kuala Lumpur International Airport, Sepang.	DOE	Info., advice, Review Panel, & comment	EIA proper is carried out by consultants.

APPENDIX E: [CONT.]

AGENCIES & EIA PROJECTS	LEAD AGENCY	FORM OF PAR-TICIPATION	REMARKS
Forestry Department			
• Proposed Golf Course and Resort Development at Frasers Hill, Pahang.	Messrs. Magic Hill Resort.	Comments to DOE.	
• Proposed Quarry at Ulu Yam, Ulu Selangor, Selangor.	Galian Bersama Sdn. Bhd.	Comments to DOE.	
• Proposed Development of Housing Area, Recreation, Institutions and Industrial Zone at Sungai Buloh Forest Reserve, Selangor.	PKNS	Review Panel.	
National Petroleum [PETRONAS] - Marine Department			
• Onshore Exploration Drilling of Block SK 14.	PETRONAS.	EIA Team.	
• Miri Gas Separation Plant.	PETRONAS.	EIA Team.	
National Energy Board			
• Development of Power Stations.	NEB	Info., advice &	consultancy provided by local
• Other projects like Sepang Airport, tourist chalets, hydro lakes, etc.	Relevant developers.	comments	universities and institutions.
Agriculture Department			
• Gas Utilisation Project [Phase 2].	DOE.	Review Panel.	
• Genting - Fraser Hill Link Road.	EPU.	Info. & Review Panel.	
• PLUS Highway.	DOE.	Comments to DOE.	
• Penang Hill Project.	P.Pinang State Government.	Info. & Review Panel.	
• Others: on project basis.	DOE.	Review Panel.	Detail EIA Review Committee [3 registered members].
Veterinary Services Department			
• Comprehensive Plan for Pig Farming Areas in Negeri Sembilan.	Negeri Sembilan State Government.	Provide advice & as EIA team member.	Study was conducted by Primary Industry Enterprise, Singapore
Drainage and Irrigation Department			
• Proposed Golf Course and Recreation, Bangi, Selangor.	Pakatan Perunding Yusof	Comments to DOE	
• Proposed Extension of Prai Industrial Area - Part IV.	Penang Development Corp.	Comments to DOE	
• Proposed International Islamic University Campus, Gombak, Selangor.	Kemas Runding.	Comments to DOE	
• Golf Course and Housing in Bukit Katil, Melaka.	Kumpulan Lion Ayer Kroh.	Comments to DOE	
• Marina Development Projects, Kuah, Langkawi.	Pertiwi Resources.	Comments to DOE	

APPENDIX E: [CONT.]

AGENCIES & EIA PROJECTS	LEAD AGENCY	FORM OF PAR-TICIPATION	REMARKS
• Golf Course, Setapak, Kuala Lumpur.	Mimaland Berhad.	Comments to DOE	
• Waste Disposal Site, Jalan Puchong, Kuala Lumpur.			
• Factory for Maldehyde and Glue Resin, Bintulu, Sarawak.	Hexza-Nesfe Chemical	Comments to DOE	
• Integrated Toxic Waste Disposal Site	I. Kruger Assoc. USA.	Review Panel.	ad-hoc panel.
Muda Agricultural Development Authority [MADA]			
• Monitoring of pesticide Residues in the Rice Ecosystem.	Nuclear Energy Unit.	Provide Info. and EIA Team Member.	Funding is also provided by MADA for both projects.
• Siltation Studies in the Muda and Pedu Reservoirs.	Nuclear Energy Unit.	Provide Info and EIA Team Member.	
Fisheries Development Institute [LKIM]			
• Construction of Loji Penapis Minyak at Tangga Batu, Melaka.	DOE	Comments to DOE	
• Container Terminal at Butterworth North: Preliminary EIA Study.	DOE	Comments to DOE	
• Proposed Mini Port in Kuala Perlis, Perlis: Preliminary EIA Study.	DOE	Comments to DOE	
Agricultural Research & Development Authority [MARDI]			
• EIA studies on land use changes at MARDI Research Station in Jelebu.	MARDI	information, EIA Team member & advice to local auth	In the process of final revision.
State Economic Development Corporation [Johor]			
• Industrial Area, Tebrau II Phase II [200 acres]	JSEDC	Provide information and advice to consultants.	EIA prepared by consultants for all projects.
• Industrial Area, Senai III [330 acres]	JSEDC		
• Industrial Area, Pasir Gudang Extension [1,249 acres]	JSEDC		
• Industrial Area, Pagoh [160 acres]	JSEDC		
• Industrial Area, Ulu Tiram [200 acres]	JSEDC		
Museums Department			
• Kenyir Hydro-electric Project, Terengganu	National Electric Board	Provide information.	
• Tembeling Hydro-Electric EIAs	National Electric Board	EIA Team member.	
• Pergau Hydro-Electric	National Electric Board	EIA Team member.	

APPENDIX E: [CONT.]

AGENCIES & EIA PROJECTS	LEAD AGENCY	FORM OF PARTICIPATION	REMARKS
• Tekai River EIA	National Electric Board	Provide information.	
• Structure Plans	Town & Country Planning Department.	Provide information & advice to local authority	
Agriculture University [Science and Environment]			
• Electrical Power Plant Expansion.		EIA Team member	
• Land Reclamation & Development Project.		EIA Team member	
• Dengkil New Industrial Site.		EIA Team member	Provide consultancy services
• ESI Mapping of the Chukai-Kuantan Coastline.		EIA Team member	
• MNLG Project, Bintulu.		EIA Team member	
• Bintulu Port Dredging Project.			
Agriculture University [Engineering]			
• Ad hoc projects forwarded by DOE for comments.	Project proponents.	Comments to EIA Review Panel.	Involved in evaluation of EIA Reports.
National University [Public Health and Medicine]			
• Malaysian Integrated Scheduled Wastes Collection and Disposal Project.	DOE	EIA Team member	Consultants: I. Kruge AS, Denmark, UEM [Malaysia]
National University [Geology]			
• PETRONAS Marine Facilities at Pantai Kundor, Melaka	PETRONAS	EIA Team member	
• Preliminary EIA of BHP-CPC Petroleum Refinery, Bintulu, Sarawak.	PETRONAS	EIA Team member	With Environmental Technology Inc.[ETI] Hawaii.
Science University [Housing, Building & Planning]			
• Kuala Juru Industrial Land Reclamation.		EIA Team member	With Environmental Research Group, USM
• Batu Kawan Fisheries.		EIA Team member	

[INFORMATION AVAILABILITY SURVEY: AUG - SEP 1992]

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