Application of Integrated Sustainability-based Strategic Environmental Assessment (SEA): a Case Study of the Master Planning Process in Dalian, China

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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ABSTRACT

Strategic Environmental Assessment (SEA) has gained increasing prominence as a means of accommodating the goals of sustainability in development planning since the 1990s. However, SEA faces considerable difficulties before it becomes a widely accepted and enduring practice. The concepts of SEA and sustainability are complex. SEA has necessarily to deal with a variety of planning and decision-making contexts, and in addition there is a problem of integrating SEA with planning. This combination of factors makes the future role of SEA in environmental planning highly challenging. Literature on sustainability, environmental assessment, and planning suggests that application of sustainability-led and context-dependent principles for SEA can assist in the realization of goals of sustainability. Meanwhile, the effective integration of SEA and planning processes can serve as a means by which sustainability objectives, urban planning practice and SEA application might be addressed. Central to this integration are institutional arrangements which define the extent to which SEA can promote sustainability.

This research has been designed to explore the opportunities offered by SEA to provide the degree of strategic connectivity required to strengthen the position of sustainability concerns in the formulation of policies and planning. In particular, it defines the requisite principles and institutional conditions for using SEA as a tool for facilitating sustainability in the context of urban planning in Chinese cities. The research employs a primary case study design, and multiple data and analytical methods which have involved surveys, key informant interviews, secondary data and direct observation.

SEA was introduced as part of the 2003 Chinese environmental impact assessment (EIA) law for use with government plans and programs at various levels. The incorporation of SEA into the master plan for city development in the city of Dalian was the first attempt at the use of SEA in any Chinese city and was designed to serve as a demonstration project for other cities to follow. However, the Dalian SEA case was not successful, highlighting the difficulty of facilitating sustainability goals and achieving integration with the planning process. The problems were complex but could be reduced to two major issues: lack of explicit guidelines or principles for the application of SEA, and fundamental institutional impediments.

The research concluded that to increase the effectiveness of SEA application in China it is imperative to formulate a set of explicit and sustainability-based principles for SEA and reform the institutional arrangements for environmental assessment and planning, enabling the integration of SEA and planning processes.

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GLOSSARY OF ACRONYMS

SEA	Strategic Environmental Assessment
EIA	Environmental Impact Assessment
PPPs	Policies, Plans, Programmes
SEPA	State Environmental Protection Administration
DPB	Dalian Planning Bureau
DEPB	Dalian Environmental Protection Bureau
DDRC	Dalian Development and Reform Commission
DDRIES	Dalian Design and Research Institute of Environmental Science
ENGO	Environmental Non-Government Organizations
EU	European Union
CCICED	China Council for International Cooperation on Environment and Development
PIA	Participatory Integrated Assessment
EPL	Environmental Protection Law
CIDA	Canadian International Development Agency

CHAPTER 1 INTRODUCTION

1.1. BACKGROUND TO THE STUDY

With the ever-growing need to apply environmental assessment, from specific projects to policies, plans and programs (PPPs), strategic environmental assessment (SEA) has gained increasing prominence as a means of facilitating sustainability in development planning. China has responded to this call by including SEA requirements in the 2003 Chinese Environmental Impact Assessment (EIA) law for use with plans and programs at various government levels. The initiation of SEA undertakings not only complemented the project-oriented EIA process but also marked a real step forward with respect to promoting sustainability considerations in policy-making in contemporary China (Pan 2005; Chen and Chen 2005). The reasons for this shift are multifaceted, including the influence of international aid agencies, pressure for transparency in policy decision-making, increased environmental awareness among both policy-makers and the public, a desire to improve the quality of EIA at the project level, and the challenge for good environmental governance in the long term. The most important impetus, however, has been the need for pursuing sustainable development in a fast-growing China whose economic growth rate has been averaging nine percent per annum (Che *et al.* 2002; Xi and Wang 2003; Zhu and Ju 2003; Lai *et al*. 2003; Chen and Chen 2005; Pan 2005).

Strategic environmental assessment has been seen as a valuable tool for fostering progress towards sustainability. In its various forms, SEA has evolved over the years from the environmental assessment of specific projects to a process capable of addressing

a wide range of policy alternatives and cumulative impacts, and of considering monitoring and mitigation measures in the early stages of policy-making, planning and program development. Consequently, it has the potential benefit of improving the information base for policy-making, streamlining project-level EIAs, facilitating greater transparency and early public involvement at the strategic level and, perhaps most importantly, providing a framework within which the pursuit of sustainable objectives and principles is integrated into policy-making and planning processes (Shepherd and Ortolano 1996; Sadler and Verheem 1996; Thissen 2000). Many analysts have noted that SEA provides both an entry point to, and the continuing groundwork for, effective integrative sustainability-based assessment (Kørnøv and Thissen 2000; Stinchcombe and Gibson 2001). SEA's duality is best explained by its twin roles: from the outset it serves as advocate of an integrative approach, offering explicit environmental provisions on environmental impact evaluation and mitigation and enhancing environmental awareness in the planning process; it also provides a solid base on which to build a general development framework that addresses broader concerns of sustainability (Kørnøv and Thissen 2000). The discretionary flexibility in this regard can assist practitioners in both developed and developing countries to select an appropriate approach to conducting SEA for the specifics of proposed initiatives. As such, Sadler (1999) has proposed that SEA be used as a tool for "sustainability analysis" or for carrying out a "sustainability test".

Although there are considerable variations in the form of SEA between countries and regions, the degree to which SEA can contribute to sustainability generally depends on three key variables: (1) the underlying concept of sustainability (Stinchcombe and

Gibson 2001; Sheate 2003); (2) the planning and development frameworks that can accommodate sustainability needs at different tiers of the decision-making hierarchy (Eggenberger and Partidário 2000; Baker and Fischer 2003); and (3) the relevant policy and decision-making context, particularly the institutional arrangements that define the role played by SEA in resource management, and through which this role can be made known to a wider public (Thérivel *et al.* 1992; Kørnøv and Thissen 2000; Sadler 1996; Glasson and Gosling 2001). Furthermore, integration of SEA and planning processes is a crucial precondition if SEA is to be effective (Eggenberger and Partidário 2000; Sheate *et al.* 2003).

Notwithstanding the general agreement on the factors that influence how SEA undertakings address sustainability issues, the criteria for good SEA practice and how such practice can achieve sustainable objectives remain a much debated research question. It is acknowledged that the most appropriate forms of SEA are best studied in the specific contexts to which they are applied (Thérivel and Partidário 1996; Verheem and Tonk 2000). There are many examples of successful SEA application in developed countries, particularly in EU countries and Canada where SEA is a high-profile process. But some hold certain reservations about whether these successes in SEA application can be replicated in the differing political and social contexts of developing countries (Dalal-Clayton and Sadler 2002). Since the mid-1970s, under the influence of and with assistance from developed countries, most developing countries have a project-level EIA system in place. Their performance, however, generally falls far behind that of EIA in developed countries (Wood 2003). Apart from technical difficulties, structural problems

are the biggest constraints. Of these problems the issues of lack of political and institutional will, bureaucratic resistance, corruption and compartmentalized administration will be magnified when SEA is applied, given that greater integration and coordination are required than in project-based assessments (Dalal-Clayton and Sadler 2002).

Nevertheless, some authors have emphasized that ultimately SEA can help solve EIA failure in developing countries. The use of SEA may on the one hand enhance the influence of environmental authorities because of its proactive influence on broad policy sectors, and, on the other hand, could increase coordination among ministries in the processes of policy-making and plan development (Alshuwaikhat 2005; Dalal-Clayton and Sadler 2004). As such, SEA application is of crucial importance in improving environmental decision-making as well as promoting progress for sustainability in developing countries. To date, SEA literature is, however, limited in terms of both theoretical exploration and empirical studies with respect to the emerging needs of developing countries and their adoption of SEA. Furthermore, there is little research which looks into the useful lessons to be learned from developed countries and the degree to which these can be applied in developing country contexts.

1.2. STATEMENT OF PROBLEM

It is widely recognized in the literature that those who wish to apply SEA face considerable difficulties in seeing this tool used as part of common practice in planning processes (Barker and Fischer 2003; Dalal-Clayton and Sadler 2002; Fischer and Seaton

2002; Glasson and Gosling 2001). Defining sustainability in differing situations has proved very difficult and the concept of SEA and its application are also extremely complex. In one form or another, SEA must deal with a variety of planning and decision-making contexts, and be integrated into planning processes (Eggenberger and Partidário 2000). In conceptualizing relation between sustainability and SEA, most analysts have argued that a set of more general and overarching principles of sustainability that can be adapted to the specific context might work well for EIA and SEA applications (Gardner 1989; George 1999, 2000; Sadler 1999; Gibson 2002). These principles ensure that environmental concerns become part of the mainstream practice in planning and decision-making while incorporating social economic and biophysical dimensions. However, there has been little empirical evidence to fully test these principles or prove them workable in the greatly different circumstances of developing countries.

Furthermore, although much of the literature has indicated that the delivery of sustainability-based SEA in planning processes has considerable value, experience in European countries indicates that the key aspects of sustainability embedded within SEA may be too readily lost. This happens either because decision-makers may sideline environmental concerns in their attempts to achieve other meta-objectives at the heart of sustainability or because depth in environmental investigation is sacrificed to achieve breadth of coverage in sustainability-based assessment (Verheem and Tonk 2000; Sheate *et al.* 2004). Meanwhile, a degree of resistance to using SEA exists among policy-makers and planners who express concerns that it may lead to delays in the planning process (Stoeglehner 2004). In particular, some planners have argued that the broad principles of

EIA are already incorporated in the planning and decision-making process and that the adoption of SEA would bring only marginal advantages (Eggenberger and Partidário 2000). Therefore, one critical aspect of SEA remains to be demonstrated through research: that is, in what way is planning systematically carrying out the key essence of sustainability principles and integrated SEA application informatively and accountably?

1.3. STUDY PURPOSE AND OBJECTIVES

Given these problems, this SEA study is guided by two key research questions:

1. What principles should be pursued in the SEA process if SEA is to be a tool for improving environmental performance and ensuring better attention to sustainability concerns in Chinese cities?

2. How can the application of SEA be embedded institutionally in the development planning framework and facilitate progress towards sustainability in at the local level of Chinese cities?

The purpose of this study is to explore the opportunities and conditions for SEA to provide the degree of strategic connectivity required to strengthen the significance of sustainability concerns in policy and planning formulation in developing countries. Specifically, the study attempts to explore the utility of a principle-based approach to SEA application at the municipal level in China in an effort to promote progress towards sustainability, and to investigate the institutional integration of SEA and planning processes.

To this end, the research has been carried out in the city of Dalian, China, using a country–city-specific case study method. China is one of the few developing countries

that have SEA requirements in place and has started making strong political commitments to SEA undertakings at the urban city level with the enactment of the new EIA law in 2003 (Dalal-Clayton and Sadler 2004; Pan 2005). More importantly, China's size both in terms of land and population and the speed of its development have made responses to its environmental problems and sustainability issues essential both to China's future and that of the world (Cann *et al.* 2005). The city of Dalian is recognized by both native and Western researchers as environmental leaders in China, setting a positive example of environmental protection for other cities, and holding China's best hope for achieving the goals of sustainability (Ma and Ortolano 2000; Shin 2004; Economy 2005). As such, the city was designated as an experimental city to implement SEA requirements by the national environmental authority, the State Environmental Protection Administration (SEPA). The study investigates the first formal SEA process in Dalian, applied to the city's Master Plan for urban development between 2000 and 2020. In particular, five research objectives have been identified:

- Objective 1:

  To document and describe the environmental policy and adoption of sustainable development in the post-1978 period of China, with a particular focus on understanding the Chinese concept of sustainability and the emerging needs of building a harmonious society;

- Objective 2:

  To examine the problems associated with environmental assessment and master plan-making at the municipal level, and explain the existing institutional arrangements of Chinese environmental and planning bureaucracies at the local level;

- Objective 3:

  To test the applicability in the context of Chinese master plan-making of sustainability-based principles for SEA drawn from western SEA literature;

- Objective 4:

  To search for an integrated approach to SEA application that fits better into the existing planning and environmental management structure in Chinese cities, with a particular focus on institutional arrangements that facilitate the integration of SEA and planning;

- Objective 5:

  To develop recommendations for strengthening the role of SEA in promoting sustainability in urban planning processes in Chinese cities, and other similar development contexts.

1.4. SIGNIFICANCE OF STUDY

The study offers both academic and practical contributions. First, it explores the debate on the relationship between SEA and sustainability, and clarifies the scope and limits of SEA in development planning. To date, considerable work has been undertaken on diverse perspectives and approaches of SEA, but there is little consensus about what is required for sustainability, particularly with respect to how the social and economical dimensions can be pursued without trading-off environmental concerns (Stinchcombe and Gibson 2001). By investigating ways to specify sustainability criteria in different circumstances, and by testing some general principles of sustainability in the specific context of China, the research seeks to offer insights into the notion of sustainability in the environmental assessment of developing countries. Furthermore, the study investigates the complexities involved in integrating SEA into planning, enhancing the theoretical discussion of these two closely related but separately evolved fields (Eggenberger and Partidário 2000). As Lawrence (2000) suggested, theoretical research regarding the connections between planning theories and environmental assessment is

seriously lacking. Last but not least, the study should contribute to the sparse literature on SEA application in developing countries, specifically in China. Authors such as Gill (1999) and Chan (2004) have described China's environmental problems as bombshells waiting to explode. There are many reasons why Chinese environmental issues, and China's prospects for reducing environmental damage, should greatly concern the rest of the world. The study provides a perspective and background on the evolving Chinese environmental policy and its progress towards sustainability.

The research also seeks to offer practical recommendations to decision-makers in public, planning and environmental protection bureaucracies. It focuses on the potential added value of SEA in planning processes and the institutional constraints on the integration of SEA into planning, and defines the requisite conditions for governments if they are to take initiatives to adopt SEA in planning processes. Recommendations are made concerning how SEA can be better positioned in the overall development planning framework, which would ultimately lead to progress for sustainability objectives in Chinese cities.

1.5. METHODOLOGY

This study is characterized as exploratory research. As such, an interactive–adaptive research methodology has been selected. The interactive–adaptive method involves a case study approach and an evolving framework for analysis as new information and relationships are revealed. The literature review a critical part of this research work's methodological strategy. The role of the literature review is to inform the

development of a conceptual framework that guides the research. It is comprised of a review of three types of literature. The first category of literature focuses on the conceptualization and sustainability aspects of SEA, and seeks to present the range of perspectives regarding the relationship between SEA and sustainability and various principle-based criteria for testing sustainability in SEA applications. The second body of literature relates to interaction of SEA and planning, aiming to derive lessons from planning theories and practice about how SEA works in the planning process. The message arising from this body of literature is that the integration of SEA and planning is critical to the ultimate successes of SEA applications. The last body of literature highlights the Canadian experience in the application of SEA, both in term of success and failure, and seeks to identify good practice and principles for SEA.

The case study approach is also a vital research strategy that aims to offer a relatively holistic understanding of a case under investigation through conducting detailed contextual analysis of a limited number of events or conditions and their relationship (Yin 2003). It has typically been used in an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident (Yin 2003: 13). With the use of multiple sources of evidence, the case study seeks the most complete and detailed description of the subject under investigation (Hamel *et al.* 1993). Case study research refers to either single-case or multiple-case studies. Multiple cases seek patterns between or among cases to achieve generalizations while single-case studies emphasize in-depth and detailed coverage to ensure the representativeness of the case under

investigation (Yin 2003). But single-case design needs ‘careful investigation of the potential case to minimize the chances of misrepresentation and to maximize the access needed to collect the case study evidence’ (Yin 2003:42).

In the research conducted in this dissertation, China has been selected as a country case study, and the five-year master planning process carried out in the city of Dalian has been selected as the case to be investigated. The master plan of Chinese cities, the so-called “Urban Development Master Plan”, is one planning strategy that is widely used by the national government to regulate and guide overall development in terms of urban space and urban land. The plan-making process represents a typical planning approach in Chinese cities, and some lessons learned from it can be generalized to other cities that face similar SEA application problems. Hence, this process of plan-making proved to be an excellent observation point for understanding Chinese sustainability commitments in environmental assessment and planning processes. Detailed discussion of the range of research methodologies, including the rationale for single-case design, the methods involved in data collection which mainly include semi-structured interviews, questionnaire, secondary data collection, and the problems encountered in the research is provided in Chapter 2.

1.6. STUDY LIMITATIONS

This study has been conducted against the background of the many economic and social changes that are taking place in China. Because of the particular culture, political and social context of contemporary China, some of the results from this research may

have limited relevance and significance outside China. Furthermore, the city of Dalian is one of the most economically and environmentally advanced Chinese cities, so that any analysis drawing on Dalian's experience with SEA and urban planning may be limited in terms of applicability and generalizability. However, given the particular top-down management mode and standard planning format followed by most Chinese cities, some conclusions may be generalized to some coastal cities that are at the same development level as Dalian. Since Dalian was chosen by central government as an experimental city for the adoption of SEA, its experience with SEA may even be directly applicable to inland cities with differing environmental situations through the use of centralized administration rules and orders. Therefore, a number of conclusions and policy guidelines may transcend the Dalian context, and be applied in other Chinese municipalities.

The information resources and time available to the researcher are further limitations of this study. The concept of SEA and its application is a new topic. I have focused extensively on SEA and planning practice from 2003 to 2006, a period when China first introduced the SEA requirements in the new EIA Law and applied the process to pilot projects in some cities. My findings, therefore, apply to a certain point in time and may not be replicated five or 10 years from now. In particular, China is experiencing tremendous transformation in every aspect of its economy and society. The conditions and environmental policy with regard to SEA application will change, even if not completely, in the foreseeable future. The availability of the data resources used in this research was also limited. Traditionally, government agencies were unwilling to reveal plans and policies at strategic levels, nor to engage in interaction and co-operative

activities involving outside researchers. All the activities of data collection (surveys, interviews, secondary sources and direct observation) were restricted because the government agencies under investigation had some reservations about revealing information concerning urban plans and policies as well as those concerning coordination activities between agencies.

Lastly, it is important to acknowledge biases that the author might hold in any qualitative study (Douglass and Moustakas, 1984). The conceptual and theoretical biases that the author might have brought into this research involved the sustainability and planning theories upon which the research was based, as well as preconceived notions with regard to a Chinese development context. Cultural biases may also have been brought into this international study. Canadian SEA literature was intensively examined in the study. Canada was chosen because of its high profile in SEA practice and theoretical development, particularly its experience of linking SEA with sustainable development strategies. It is clear that China can benefit from Canada's experience in managing environmental problems although it is recognized that the two countries have very different challenges. Given China's increasing investment in Canada's natural resources sectors, the former has an opportunity to see how SEA is applied in a country that also has a vast geographical territory, for despite the significant demographic and cultural differences, some worthwhile approaches may be transferable. Nevertheless, China and Canada are two countries with greatly contrasting political frameworks, forms of development and culture, EIA and urban planning systems, as well as interests and objectives of sustainability. As the research was based on Western views and solutions to

environmental issues, the author may perhaps have undervalued the local Chinese knowledge systems and constraints. Some of the analysis may have reduced the complexity and intensity of environmental problems faced in China's cities because the analytical framework was formed on the basis of Western literature. However, the author's Chinese background will have partly rectified these cultural problems. The primary research and interviews were conducted with Chinese officials in China without the need for a translator, and this will have helped considerably to mitigate this possible limitation.

1.7. STRUCTURE OF THE THESIS

Chapter Two discusses the research methodology of this study. The first section looks into the research strategy used in the research, which involves an extensive literature review and a primary case study design. Multiple data sources are one of the apparent characteristics of case study research (Yin, 2003). Primary data collected in this research include sources information from key informant interviews, questionnaire surveys, direct observation and secondary data. However, the researcher had difficulties in gaining access to the four government agencies under investigation and encountered a degree of suspicion from the government officials towards a researcher from an international institution who was conducting a research project on governmental policy and institutional arrangements.

Chapter Three reviews the range of perspectives of SEA literature. SEA has emerged out of a critique of the limitations of project-based EIA and of a need for

broader-based sustainability (Baker and Fischer 2003). However, a divergence of opinion exists about how to conceptualize SEA and its role in delivering sustainability. Therefore, the first part of the chapter traces the history and development of SEA worldwide. An in-depth discussion follows, aimed at helping to understand to what extent and in what way SEA can be used as an effective tool for promoting sustainability. The environmental planning and management theories and principles outlined in the second part form the basis for development of a conceptual framework designed to guide the study. The framework considers the three conditions essential to building a successful approach to SEA: to be context-dependent, sustainability-led and integrated with planning. These conditions also provide the basic analytical framework of this study.

Chapter Four presents the context within which SEA and urban planning operate in Chinese cities. A historical review of China's environmental and sustainability policy is offered and is followed by a summary of the Chinese concept of sustainability. The new concept of building a harmonious society is put forward in order to understand the Chinese approach to sustainable development. The last part of the chapter introduces the case under investigation, the first formal SEA case in Dalian, as applied to the urban development master plan (2000-2020). It focuses on the principles adopted, and on the institutional arrangements for the four critical government agencies involved: the Dalian Development and Reform Commission (DDRC), Dalian Planning Bureau (DPB), Dalian Environmental Protection Bureau (DEPB), and Dalian Design and Research Institute of Environmental Science (DDRIES).

Chapter Five delivers the results from the assessing of sustainability-based principles for SEA in the case of Dalian's urban development Master Plan (2000-2020). Based on the five general sustainability criteria identified in Chapter Three, the analysis is categorized into five key issues concerning an assessment of progress towards sustainability: 1) equity; 2) efficiency; 3) public participation; 4) precaution and adaptation; and 5) integration. Factors influencing the application of these principles in the SEA process are identified, and the suitability feasibility of applying these sustainable principles into Dalian's SEA practice and the broader context of China is explored.

Chapter Six presents the findings from the analysis of institutional arrangements in the environmental assessment and planning process. The results are organized into six key elements, identified in Smith's analytical framework for institutional arrangements. They are legitimation, management functions, administrative structure, processes and mechanisms, and organizational culture and participant attitude (Smith 1993). The analysis highlights a number of structural problems associated with implementing SEA within the existing urban planning framework. The reasons behind these problems are also explored in detail.

Chapter Seven is a summary of the study and forms its conclusion. It summarizes the complex Chinese sustainability and environmental management context, and highlights the findings derived from the applicability of sustainability-oriented principles for SEA as well as the institutional analysis for integrating SEA and planning in the case of Dalian. The chapter then gives a number of useful policy and practice

implications for Chinese environmental bureaucracies as well as some academic contributions to SEA studies, which may enhance the effectiveness not only of the implementation of SEA in Chinese cities, but also of planning theories and practice. The chapter ends with a statement of the need for future research with regard to the role of SEA in promoting sustainability.

1.8. SUMMARY

In this chapter, the author has suggested that there is a gap in the literature with respect to current SEA studies on sustainability and planning. There is also a need to explore the conditions for integrated institutional frameworks which accommodate the principles of sustainability at different tiers of decision-making in developing countries. This study is designed to define the conditions and principles for the delivery of SEA application in Chinese urban planning processes, particularly in the urban master planning process in pursuit of progress for sustainability. The research was conducted in Dalian, China, using a primary case study method. Although the study contains some limitations in terms of conceptual framework-building, data availability and personal bias, it should produce useful implications and recommendations for improving the application of SEA in China and will, it is hoped, enhance SEA studies in developing countries.

CHAPTER 2 RESEARCH METHODOLOGY

2.1. INTRODUCTION

The choice and application of appropriate methodologies are crucial to the success of the study. In this chapter, section 2.2 examines the research strategy utilized including a literature review and a primary case study design. The literature review in this research serves two purposes: to help develop a conceptual framework; and to enhance the validity of the study. The sustainability and integration aspects of SEA are complex and multi-faceted. The case study method used in the research provides a degree of flexibility needed in this context-specific research design, and facilitates the use of various data sources to the greatest extent possible (Yin 2003). Section 2.3 outlines the various methods of data collecting, which involves interviews, surveys, direct observation and secondary data. The author encountered some problems in the process of data collecting, which limited the data availability. Every method has its advantages and limitations. Nevertheless, some lessons from this process will be useful for future studies on China‘s issues.

2.2. RESEARCH STRATEGY

2.2.1. Literature Review Method

An extensive literature review was conducted to inform the development of a conceptual framework designed to guide the study. The literature focused on three areas: the conceptualization and sustainability aspects of SEA, the integration of SEA with

planning, and SEA practice with a focus on Canadian experiences. The following are the key literature sources utilized.

2.2.1.1. SEA and Sustainability

Early SEA studies in the late 1980s discussed the need for extending project EIA to policy EIA and the quest for sustainability in planning and environmental assessment (Jacob and Sadler 1989). During the1990s, the main efforts of SEA researchers were focused on case studies and elaborating the potential scope, procedure and method of SEA. It is suggested that initially SEA practices ran ahead of SEA theory in that considerable experience and innovation were achieved in development planning, urban and rural planning and formulation of sustainability policies and strategies. For instance, a special issue of *Project Appraisal* (Vol 7, 1992) reviewed the SEA development in the US, Australia and New Zealand, and the Netherlands in the field of land-use planning, water management, and transportation planning. Other studies also compared the similarities and differences between SEA and project EIA (Wood and Dejeddour 1992), and examined the need for undertaking SEA in local communities, industry, and environmentally sensitive areas (Thérivel *et al.* 1992).

Several comprehensive perspectives and reviews of SEA were published in the late 1990s. An assessment of the effectiveness of EIA and SEA by Sadler and Verheem (1996) was an important reference work. They reviewed extensively 52 cases studies and institutional profiles of SEA systems in developed countries and international agencies, evaluated the status and effectiveness of SEA processes, and identified the challenges and

future trends of SEA applications. In the same year, the work of Thérivel and Partidário (1996) examined international SEA guidance, regulations, and methodologies. Also, 10 case studies in sectoral SEAs, SEAs of comprehensive land-use plans, and policy SEAs were presented. The *Handbook of Environmental Impact Assessment* (Petts 1999) collected several papers of SEA that provided updates of SEA theory and practice, including principles, methods, and potentials of SEA in delivering sustainability.

More recent studies of SEA have given significant attention to SEA theory building and effectiveness. A special issue of *Impact Assessment and Project Appraisal* (Vol.18, 2000) critically reviewed the conceptual, institutional and methodological issues that had emerged lately in SEA theory and practice. A collection of papers edited by Partidário and Clark (2000) primarily focused on SEA application in North America. The International Association of Impact Assessment (IAIA) suggested six criteria for evaluating SEA performance in 2002. More recently, Dalal-Clayton and Sadler (2004) undertook a systematic comparative analysis on SEA on an international scale, which provided a valuable basis for discussion on SEA practice worldwide.

The goal of using SEA as a tool for achieving sustainability commenced in the middle of the 1990s. Several authors stressed the value of SEA in designing sustainable development policies and strategies (Thérivel and Partidário 1996; Sadler and Verheem1996; Shepherd and Ortolano 1996; Sadler 1999). Work by Stinchcombe and Gibson (2001) outlined ten compelling advantages and barriers of SEA as a powerful means for pursuing sustainability. Meanwhile, many authors have attempted to develop a

set of more general and overarching principles and criteria for sustainability to guide EIA and SEA applications. This included the work by Sadler (1999), George (1999, 2000) and Gibson (2002, 2005). Notably, the Bellagio Principles developed in 1996 were aimed at providing the Guidelines for Practical Assessment of Progress towards Sustainable Development (Hardi and Zdan 1997). Gibson *et al*. (2005)'s book on sustainability assessment presented eight comprehensive criteria for sustainability-based decision making. The review of these sources demonstrates that SEA has significant potential to promote progress towards sustainability in planning development. Realizing this potential requires three basic conditions: adoption of sustainability-based principles or criteria, context-specific consideration, and integration of SEA with planning processes. The three requisite conditions formed both the conceptual and analytical framework that guides the research.

2.2.1.2. Integration of SEA and Planning

The literature on the application of SEA to planning, particularly in land-use planning has dominated the SEA studies. In 1990, a special issue of *Impact Assessment Bulletin* (No.8) was devoted to the discussion of integrating environmental assessment in the planning process. The twenty-three papers represented conceptual thinking and a practical exploration of how EIA can be used to facilitate the development of policies and plans in both developed and developing countries. In Canada, the report by the Crombie Commission (1992) on the future of the Toronto waterfront was an influential work that called for the application of ecosystem approach and an integrated approach to planning and environmental assessment. Fischer (2002) examined the SEA application in transport

and land-use planning in the UK, the Netherlands and Germany. Fischer considered the specific planning and political system in which SEA operated, concluding that it is possible to integrate SEA into the process of PPP formulation and such integration would improve SEA performance. Similarly, a special issue *of European Environment* (Vol. 14, 2004) reported on the progress made in land use and transport planning in EU member countries. A new book edited by Jones *et al.* (2005) also focused on a systematic evaluation of SEA and land use planning in fourteen countries and regions.

With reference to the form of integration, Glasson and Gosling (2001) suggested a set of possible models of SEA and planning, ranging from very limited to full integration. Sheate *et al.* (2001) categorized four broad integration models of SEA based on case studies in European countries. Furthermore, the article by Eggenberger and Partidário (2000) summarized five forms of integration. Central to the SEA integration are institutional arrangements. An examination of this aspect of literature included the work by Mitchell (1987), Mitchell and Pigram (1989), Smith (1988, 1993), Holland (1996), Sadler (1996), Thérivel and Partidário (1996) and Glasson and Golsing (2001) and others. This body of literature is the basis of the development of an analytical framework for institutional analysis of integration discussion in the case study, as described in section 3.3.

2.2.1.3. Overview of Canadian SEA Literature

An effort was also made to review examples of effective applications of SEA across the world as noted in the literature. There is a large volume of literature that

reported the best practice of SEA in the EU countries, England, the US and Canada. However, because of time constraints of the research, it was impossible to review all the literature from a comprehensive and international perspective. Consequently, the author chose to focus primarily on the Canadian experience in conducting SEA. Canada has not only been active in SEA practical undertakings, but has also been innovative in the conceptual development. In the 90s, Canada established the first generation of the SEA system. It was regarded as a source of concept innovation at the time because the application was extended to the highest level of policy and programme proposals submitted to the Cabinet and ministries, posing a modest challenge to the government's authority (Wood 2003; Dalal-Clayton and Sadler 2005). The Canadian SEA was and is still a non-statutory procedure that features flexibility and discretion, and it featured the intense links between SEA and development strategies prepared and implemented by federal departments and agencies (Noble 2002). Canada commitment to sustainability through the use of SEA was explicitly stipulated in the 1999 Directive on the Environmental Assessment of Policy, Plan and Program Proposal (1999 Directive). Gibson and his colleagues (2005) published the first major book on the use of sustainability-based criteria in environmental assessment. The work reviewed a landmark case of environmental assessment, the Voisey's Bay mining operation in Labrador, Canada, which introduced "contribution to sustainability" as the basic test of acceptability (Gibson et al. 2005 p.5). The authors identified the key requirements and criteria for sustainability assessment, noting the importance of incorporating sustainability considerations into the design of an assessment process and outlined the essential steps for implementation. Other Canadian literature that explored the

relationship of sustainability and environmental assessment include Sadler (1990, 2005), Marsden (1998), Gibson (2002, 2002b), Wood (2003), and Noble (2000, 2002, 2004, 2004b), the work discussing Canadian practice in building a sustainable city by RCFTW (1992), Graham *et al.*(1998), Nowlan *et al.* (2001), Dalal-Calyton and Sadler (2005). This body of literature focused on studies that consider the most notable examples and key characteristics of SEA application at the municipal and urban region level in Canada. As such, Canada can offer some good examples of the challenges and opportunities when attempting to apply SEA in practice. The Canadian experience, both in term of success and failure, is drawn out from these sources and presented as a country example of SEA applications.

2.2.2. Case Study Method

The case study method is adopted here in order to examine the issues associated with SEA application in Chinese cities. Conducting a social science study in a changing context in China poses challenges to data collection efforts of any researchers due to the limitations of data sources and the distinctively different political system. From the beginning, it was clear that a purely quantitative strategy such as the use of surveys would not work sufficiently to obtain the data needed in the research. Access to the governmental planning and environmental bureaucracies is extremely limited considering that the planning and assessment processes are not open to the public. In this situation, the case study strategy has proven to be particularly advantageous.

As Yin noted (2003), the case study approach has three distinctive characteristics. First, it is able to cope with a particular situation where many variables of interests are involved. Second, the case study method can make use of multiple sources of evidence through a mix of methods of data collection. Last, a case study can benefit from the prior development of theoretical propositions. Yin (2003, P17) defines the case study method as a research strategy,

> an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

It is worth noting that, in Yin's view, case studies should not be confused with qualitative research and the approach can be based on any mix of quantitative and qualitative evidence (Yin 2003).

2.2.2.1. Rationale for a Single-Case Design

Case studies can be single-case or multiple-case applications. Multiple case studies follow the logic of replication to gain more general research result. Single cases can be very useful at testing a theory that has specified propositions, or examining extreme, unique, representative cases (Yin 2003). The latter is the rational for the use of single-case design in this research. The Dalian's SEA case applied to the urban development Master Plan (2000-2020) involves not only typical representative activities of planning and environmental assessment which rest firmly within the top-down authoritative Chinese political context, but also some distinctively different actors who are present only in a few environmentally advanced Chinese cities.

The Dalian Urban Development Master Plan (the Master Plan hereafter) is a 20-year, multi-sectoral city development plan drawn up in accordance with the Urban Planning Act 1989. The plan consists of three key elements: the development principles and preferable city size; the spatial lay-out and land use pattern; and the supporting conditions and safeguard measures. This Master Plan serves as a critical policy tool of the government to regulate and guide overall land use, control the city size and direct the sectoral and district development. The planning process in the municipal level represents a typical planning approach in most Chinese cities; and some of lessons learned from studying SEA utilization to this process in a given city can be generalized to Chinese environmental management and planning bureaucracies in a broad sense.

Meanwhile, the City of Dalian has some unique characteristics that distinguish it from other cities, particularly most inland cities. First, Dalian was designated as one of fourteen coastal cities that opened to the outside world in 1984, and benefited from preferential economical policies and managerial systems. Along with the other thirteen coastal cities and four economic zones, Dalian is part of a chain of most economically advanced cities, or the so called "14 plus 4" core cities of China (Figure 2.1). In 2005, these core cities, with 7.4 percent of national population, accounted for 21.4 percent of national GDP (National Bureau of Statistics of China, 2005). Dalian, along with other coastal cities, is more economically advanced and therefore more financially capable of environmental protection than most inland cities. In addition, they have easier access to the international communities and are more likely exposed to widely accepted trends and practices occurred in the other countries and areas. As such, Dalian's experience in the

utility of SEA both in terms of success or failure may be limited to the core cities at a similar stage of development. Most inland cities may not possess the same economic and policy conditions to implement the Dalian mode of SEA. However, according to China's open, reform policy, Dalian and other core cities have served as the "Window of China" to the world, and had multiplier effects on accelerating inland cities' development. In the foreseeable future, other inland cities may have the ability to follow Dalian and other core cities.

Figure 2.1 14 Chinese Open Coastal Cities and 4 Special Economic Zones (Source: www.wcmfmprc.gov.cn, 2006)

Second, Dalian's experience of SEA may be a leading example or an indicator of the capacity for and direction of change in some distinctive Chinese cities. Recent years

have witnessed considerable experimentation and innovation in the development and implementation of strategies that gear towards a garden or sustainable city. The extraordinary environmental performance of Dalian reflects the decentralized nature of China's environmental protection system (Shin 2004). However, such decentralization of authority could either lead towards or away from sustainability which, to a great extent, depends on leadership of local governments and their commitments to sustainability. This view was illustrated well by Seabrooke *et al.* (2004) who stated that the obstacle to accommodating sustainability in China lies not within the national government, but largely in local leaders who ignore central policy and pursue purely economic and local interests. It is clear that compared with other Chinese cities, Dalian has a higher level of political willingness and institutional capacity for promoting progress towards sustainability. The strong local leadership of environmental protection in many respects has helped to overcome some policy and structural impediments inherent in the Chinese authoritative political system. This strong leadership also provides a key reference context where critical discussion on the requisite conditions for achieving sustainability objectives in Chinese cities is not only relevant, but inspires some meaningful insights into the applicability of use of SEA in the Chinese setting. Meanwhile, Dalian's case may be used to test whether SEA works well in the Chinese cities that are economically advanced, environmentally friendly and politically committed. As such, the selection of Dalian's SEA case represents both unique and common attributes of China's environmental protection and planning reality.

2.2.2.2. Units of Analysis

Case studies can be holistic or embedded, the latter relating to multiple units of analysis. The unit of analysis refers to a system of action that is selective and fundamental to the development of case under investigation (Yin 2003). This research was an embedded case study that involved two units of analysis: the delivery of sustainability and institutional arrangements for environmental assessment and planning at the urban Chinese cities.

- **The Application of Sustainability in China**

China's sustainability effort commenced in 1994 with release of China's Agenda 21—the White Paper on Population, Environment and Development of China in the 21st Century. With China's unprecedented speed of economic development, a multitude of problems of development and its associated environmental impacts have undermined the progress for implementing the Agenda 21 and progress for sustainability. Bradbury and Kirkby (1996) attributed the problems to the lack of clear development principles and effective methodology to assessment impacts. More profoundly, Breslin (1996, p.107) suggested

> The notion of a development-environment dichotomy in China…is not simply a case of balancing short-term development priorities with longer term environment goals, but one of balancing short-term development priorities with even shorter social and political concerns.

Obviously, China's progress for sustainability has gone far beyond coordinating the relationship between the environment and economic development. Political and social factors have played a determining role in implementing sustainability policies in the

Chinese “socialist democracy” political system. Such concerns are the reason this research considers the applications of a set of integrated principles for SEA in China that are holistic, avoiding categorizing to ecological, social and economic factors. Another major feature for the delivery of sustainability in China has related to the increased dependence on the ability of local government to enforce environmental and sustainability policies. Decentralization and devolution have produced a patchwork of environmental performance in China (Jahiel 2000). China’s hope for sustainability has largely been determined by the ability of local governments to deliver the meta-objectives at the heart of sustainability. Therefore, this research is conducted from the perspective of a municipal or local level.

- **The Institutional Arrangements for SEA**

Four government agencies were identified as essential to the institutional analysis of SEA application in Dalian. They play important roles either in the current SEA application or in the master planning process. They are as follows:

  - **Dalian Development and Reform Commission (DDRC)**

The Dalian Development and Reform Commission (DDRC) is a macro-economic regulatory agency under the Dalian Municipal Government. In the Chinese top-down planning system, the commission undertakes an important function of formulating plans and policies related to economic and social development.

  - **Dalian Planning Bureau (DPB)**

Founded in 2004, the Dalian Planning Bureau is a functional agency under the Municipal Government in charge of urban spatial and township planning in the City of Dalian. There are two hierarchical urban plans formulated by DPB: Urban Master Plan and City Detail Plan. Both are statutory plans and required to be drawn up in accordance with Urban Planning Law. In this research, the case under investigation is the first tier of urban development master plan (2000-2020), formulated by DPB.

- **Dalian Environmental Protection Bureau (DEPB)**

Environmental protection has a high profile in Dalian, led and managed by the Dalian Environmental Protection Bureau (DPB). Specifically, DPB is in charge of approving the EIA reports on construction, reconstruction and extension projects; instructing the establishment of the environmental treatment measures; and implementing the environmental administration rules on pollution discharge registration and pollution discharge requirements. Increasingly, DPB has participated in environmental and urban planning processes, though there is a lack of planning tradition and institutional capacities in DPB. Dalian's SEA applied to the urban Master Plan was led and conducted by the DEPB as a designated demonstration project by SEPA. However, the leading role of DEPB is not explicitly specified in the SEA requirements.

- **Dalian Design and Research Institute of Environmental Science (DDRIES)**

The Dalian Design and Research Institute of Environmental Science (DDRIES) is a vital addition to DEPB and an active actor in local environmental protection. It is a very

comprehensive research and policy center that conducts various research projects on environmental science, regional environmental planning, EIA, and environmental risk assessment. A formal technical SEA process was carried out jointly by DDRIES and Tsinghua University.

2.3. DATA COLLECTION METHODS

The sustainable and integrative aspects of SEA application have multifaceted natures. Consequently, a particular method or a single data source might run the risk of being inaccurate and misleading. A better representation of reality should be achieved by cross-checking data from a number of data sources (Mitchell 1989, Yin 2003). Initially, the use of personal interviews was designed as the key research method, but this proved problematic after failed attempts to obtain many interview appointments. Nevertheless, some valuable interviews (n=5) were obtained. A combination of key select interviews and a mix of other methods such as questionnaire survey (n=47), observation, and secondary data collection were used. It is noted that every method has some advantages and some limitations, particularly given it was utilized in the Chinese setting.

2.3.1. Interviews

Interviews and questionnaires are both “interactive” methods that provide the direct access to respondents and first hand information (Palys 1997). Interviews make it possible to obtain a wider range of responses than questionnaires. But this technique is time consuming. Interviews are essential sources of case study information, and key informants are often critical to the success of a case study. In this research, author found

that most Chinese government officials hesitated to participate in an interview from an overseas institution. The researcher's personal contacts with local officials might be a critical determinant of applicability of this technique.

The five senior officials at various levels from above-mentioned four government agencies were selected as key informants. They were selected on the basis of their work responsibilities and familiarity with SEA application and sustainability concepts. Prior to the interviews, the respondents were informed of the nature of the study and interview questions by phone or fax. The open-ended interview questions were structured around three principles for an effective SEA system, namely context-specific, sustainability-led and toward integration. A certain extent of flexibility was provided to the respondents according to their individual experience and understanding on the questions, though the discussion was controlled and limited within the analytical framework (See Appendix 1 for interview questions). When possible, interviews were tape recorded (n=3) and later transcribed. Alternatively, notes (n=2) were taken during the interviews. One respondent provided the written documents related to the questions besides receiving the interview. Specifically, the five interviews were conducted with:

- Informant #1, an official of Dalian Design and Research Institute of Environmental Science
- Informant #2, an official of Dalian Urban Planning Bureau
- Informant #3, an official of Dalian Development and Reform Commission
- Informant #4, an official of the Planning Office at Dalian Development and Reform Commission
- Informant #5, an official of the Implementation Office of Dalian Environmental Protection Bureau

Although there were fewer official interviews obtained than was anticipated, these particular meetings yielded valuable insights.

2.3.2. Questionnaire Survey

A questionnaire survey was undertaken after experiencing the difficulties of setting up the interview appointments in the four agencies (Appendix 1). 50 copies of the questionnaire were sent to employees in the four departments. Among them, 47 copies were returned, providing a high response rate of 94 percent (See Table2.1).

Research Department	Time	Research Site	Copies returned
Dalian Environmental Protection Bureau	July 24-28, 2006	Environmental Supervision Department	9
Dalian Urban Planning Bureau	July 17-21, 2006	Planning Office	8
Environmental Science and Research Institution of Dalian	July 10-14, 2006	SEA Research Centre	20
Dalian Municipal Development and Reform Commission	August 1-4, 2006	Planning Office	10
Total			47

Table 2.1 Copies of Questionnaire Returned by the Four Departments

The use of the questionnaire method proved to be very successful in this research. It was cost-efficient and generated a large amount of information in a time of two weeks. But some respondents left some sensitive questions unanswered. The author also found that some participants felt that the questions limited their range of responses and added their comments to some questions. Meanwhile, considering the Chinese authoritative political context, it was very hard to ensure that the respondents were truthful to their

responses. Lastly, it was noted the high response rate in this research was not common in the Chinese studies regarding government policies and behaviors. The author took the advantage of personal contact and obtained the support from the participants' superiors.

In this research, the questionnaire contains two sections and a total of twenty-five questions. The survey was organized around the two themes of this study: sustainability principles for SEA, and the institutional arrangements for SEA integration at Dalian. Specifically, the first section was structured around the five general sustainability principles developed from the literature review; the section two focused on understanding the institutional capacity of the four agencies (See Appendix 1 for survey questions). Responses to questions were coded and participants were asked to fill out a multiple choice survey. Participants were also asked to provide their own responses when they thought the coded responses were not their choices. In a few cases, participants provided explanations in support of their answers or posed questions about the coded answers.

2.3.3. Direct Observation

The case study made use of observation methods throughout the field visits to the study site, including conducting interviews, surveying and approaching the related agencies for a research request. The method was thought to be useful in providing additional information for the research. The observation lasted for two months through July to August, 2006. The observational data included the four agencies building locations, access to their entrance, the working conditions of each agency, and the staff's attitude to the research. In addition, the researcher came from this area of China and is

familiar with the political and social culture, languages and customs, which also assisted in the analysis.

2.3.4. Secondary Data

Government reports and official documentation related to the study topic were collected and served as important secondary data. The content of this evidence was analyzed and translated when necessary. The key reports and documents involved

- The Dalian Urban Development Master Plan (2000-2020)
- The Dalian 11th Five-year Social and Economical Development Plan (2005-2010)
- The Dalian 11th Five-year Environmental Protection Master Plan (2005-2010)
- The reports on Dalian SEA Practice by DEPB at a national EIA conference, Guangzhong, China (2006)
- SEA report on Dalian Master Plan by Tsinghua University (2006)

Other supplementary data were also obtained through the government website, press releases, newspaper articles, journals and published research reports and materials. The four categories of data sources (interviews, questionnaire, observation, and secondary data) ensured the triangulation of data sources, and represent the key points of issues in discussion. In the Chinese setting, the collection of secondary data is vital to compensate for the insufficiency of first hand information. But the access to the above mentioned documents was not easy. Some were unreleased documents and others were the full version of the government plans and not open to the general public.

2.4. RESEARCH CONSIDERATIONS

2.4.1. Validity and Reliability

For any research design, a persistent concern is to establish the quality though validity and reliability tests (Yin, 2003). These tests that can minimize the errors were considered and utilized in each stage of research. The main sources of validation of research were demonstrated by the triangulation of data sources. The participants' responses, my observations, the insights drawn from the literature, and the information supplemented through secondary data were substantiated by cross checking. Reliability was tested through repeated interviews and observation.

2.4.2. Problems Encountered

Access to the four designated government agencies was a definite and persistent problem in the research. The author approached the four agencies as a university student from Canada and submitted the research abstract to the administration office of each. Unfortunately, the author, in most cases, was directed to the publicity offices, which only gave the general information or published government documents. The requests for conducting the interviews or survey were refused by most government staff in the beginning either using the excuse of being busy or no permission was received from their superior officers. Fortunately, the problem was partly solved by obtaining the support from a contact in a superior government agency. The experience, on the other hand, provided me with excellent material on the institutional problems of these departments, which closely relate to my research topic. Another problem was the high level of

suspicion by the government staff towards a research project that was conducted among several government agencies. In some cases, the participants filled out the survey after being asked by their superiors. The final problem was the inaccessibility of government documents. For example, a key element of the case study design, a copy of the Dalian Master Plan was not open to the public. I was only allowed to review the document on the site under the supervision of the staff. Most official reports and government documentation were obtained in an informal way through making use of "Guanxi" (the use of informal networking and influence).

2.4.3. Data Limitations

There are limitations in the data sources collected in the research. While the study aimed at discussing SEA application in the policy and planning process at the Chinese municipal level, participants provided the descriptive information of the planning procedures, but were cautious about discussing the institutional, political barriers and focused on the technical barriers in plan development. This can be attributed to the order-and-control Chinese government system, and the lack of transparency of the planning process. The number of interviews conducted in environmental protection authorities is the second limitation concern. Initially, the interviews were designed to be undertaken with more staff in DEPB to obtain information on issues associated with SEA practice in Dalian. Because of time constraints and the difficulty in setting up the interviews, the open-ended interviews on the staff had to be abandoned and replaced with a questionnaire survey. The limitations incurred during the study were minimized and

additional sources such as observation, journal articles and research materials were used to supplement the information.

2.5. SUMMARY

Chapter two explained the source of primary and secondary data, methods utilized in data collection as well as the problems confronted in the process. The chapter suggests that it is challenging to obtain sufficient data in an international study given time constraints, social and political barriers and limitations of research design. The use of multiple data sources is important to ensure the validity and reliability of the study. The research methods utilized were designed to fulfill the research objectives. Objective one, to document and describe the environmental policy and adoption of sustainable development in post-1978 period of China, was achieved mainly through the analysis of secondary data and literature review, and supplementary information and insights was obtained by use of key informants' interviews. Objective two, to examine the complex reasons for EIA and planning failure in Chinese cities were achieved largely by the analysis of secondary data. But questionnaire surveys and direct observation provided additional data for in-depth analysis in Chapter 6. Objective three, to test the applicability of the sustainability-based principles drawn upon western SEA literature in SEA application in China and was achieved mainly though data from the key informants interviews, the questionnaire surveys and direct observation. Objective four, to analyze the institutional problems for an integrated approach to the implementation of SEA that fits better into the existing planning structure in China, was achieved mainly through the use of the survey method and interviews. This was supported by the analysis of

secondary data. The last objectives, to develop recommendations on strengthening the role of SEA in promoting sustainability in urban planning processes at the Chinese cities and other similar development contexts, was achieved through the analysis of all the research findings and augmented by secondary data analysis.

CHAPTER 3 SUSTAINABILITY AND ENVIRONMENT ASSESSMENT: A REVIEW OF PRINCIPLES, CRITERIA AND PRACTICE

3.1. INTRODUCTION

By 2003, approximately twenty countries worldwide had established the principle that a legal requirement for SEA should be put in place, and others had adopted SEA or quasi-SEA guidelines (Thérivel 2004). Considerable experience has been gained from the application of sectoral SEA in areas such as transportation, energy, and regional and land use planning (Fischer 2002). SEA adoption, at both the municipal and national levels, has currently been stimulated by two developments. First, the trend towards globalization increasingly requires SEA to be conducted across boundaries, and to translate multinational agreements into individual targets and objectives (Scharmm 2000). Secondly, the trend towards regionalism has resulted in the formation of new regional-level planning and development frameworks, as well as new approaches to SEA (Thérivel and Partidário 2002; Baker and Fischer 2003). Nevertheless, SEA has both opportunities and constraints, and faces considerable difficulties on the path towards widely accepted and enduring practice. Glasson and Gosling (2001, p.90) recognize two major problems: institutional unwillingness and methodological or technical inability. The focus of the study is on the former. As Sadler and Verheem (1996) suggest that the pre-requisites for SEA adoption are the suitability of the prevailing and political or organizational culture and the structure of decision-making, the study attempts to explore the institutional conditions of applying SEA to achieve sustainability in an urban context

of China. This chapter traces the range of perspectives found in SEA and planning literature in order to establish an analytical framework for research on SEA application in China and the City of Dalian. First, a review of the efforts to conceptualize SEA and its links to sustainability is presented.

3.2. THE PRESENT POSITION OF SEA

SEA, in various forms, has evolved over the years from EIA processes linked to specific projects to a process capable of addressing policy alternatives and cumulative effects in development planning. Thérivel *et al*. (1992, p.23) claim that SEA "would not only overcome the worst limitations of the existing system of project EIA, but would also be a proactive step towards attaining sustainability".

3.2.1. Origins and Concepts of SEA

The United States' 1969 National Environmental Policy Act (NEPA) not only popularized the concept of EIA, but also provided the foundation of, or "a reference back" to, what become known as SEA (Fischer 2002; Partidário 2003). Though EIA has been widely practiced, primarily at the project level, in over 100 countries, and has attained increasing prominence in the planning and design of projects, in decision-making and in cost effectiveness (Donnelly *et al.* 1998), several limitations of project EIAs have also been well recognized and documented (Wood and Dejeddour 1992; Lee and Walsh 1992; Ortolano and Shepherd 1995; Thérivel and Partidário 1996; Glasson 1999; Steinemann 2001). Lee and Walsh (1992) identify four main deficiencies of project-based EIAs. Firstly, such EIAs do not make provision for assessing ancillary impacts of a major development. Secondly, consideration of alternatives has typically been foreclosed by the

decisions taken at earlier stages of planning. Thirdly, cumulative impacts have not been adequately addressed within the framework of project EIAs. Finally, small projects and non-project actions that may have significant environmental consequences have tended to fall outside the procedures of project-level EIAs. Wood and Dejeddour (1992) similarly state that project EIAs were occurring too late in the planning process to consider all the relevant alternatives and impacts. Glasson (1999) argues that project EIAs have tended to react to development proposals, resulting in an inability to anticipate and guide development. Partidário (1999) reduces the problems to three aspects: the timing of decisions; the nature of decisions; and the level of information. Goodland and Tillman (1995) compare the traditional EIA with the strategic proactive EIA, and conclude those project EIAs are necessary but not sufficient to address opportunities in a development.

SEA has emerged in this context "as a subject of deliberation and experimentation in part out of, and in response to" the limitations of project EIAs (Stinchcombe and Gibson 2001, p.346). In addition, SEA has always been elaborated as one response to the sustainability challenge identified by the Brundtland Commission (Sadler and Verheem 1996). Thérivel *et al.* (1992) suggest that SEA offers a proactive approach to implementing sustainability principles in a phased way from policies to plans, programs, and projects. Sadler and Verheem (1996) illustrate how the inception and evolution of SEA have been closely associated with two development trends: EIA-based developments and the trend towards supporting policy instruments.[1] Simply put, the term

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[1] The EIA-based trends have involved six phases of development, namely project EIA as a stepping stone, environmental inquiries as a policy mechanism, programmatic and class EIA, area-wide or regional assessment, integration of EIA with planning processes, and ecosystem and landscape approaches. Policy

"strategic environmental assessment" refers to the application of EIA at the level of PPPs. As a concept, significant disagreement exists over its scope and role. SEA, therefore, has been variously defined (Thérivel *et al.* 2000; Sadler and Verheem 1996; Partidário and Clark 2000; Sheate *et al.* 2001). An often-quoted definition given by Thérivel *et al.* (1992, p.19) mirrors structurally that of project EIA, and tends to focus attention on the biophysical environment. SEA is depicted as a formalized, systematic, and comprehensive process that evaluates the environmental effects of PPPs and their alternatives, includes the preparation of a written report on the findings of that evaluation, and uses the findings in publicly accountable decision-making. Sadler and Verheem (1996, p. 27) emphasize the value of SEA in facilitating sustainability, suggesting that SEA is a systematic process to ensure that the environmental consequences of PPPs are "fully included and appropriately addressed at the earliest appropriate stage of decision-making on par with economic and social considerations." More recent attempts at formulation are mainly the restatement and recycling of the sustainability theme of SEA. For example, Sheate *et al.* (2003, p.4) combine the essential parts of the above definitions while acknowledging the importance of public participation in the process. Partidário and Clark (2000, p.4) choose to highlight the notion of SEA as an integrated process rather than one simply geared towards the production of a report, and emphasize its broad scope, well able to encompass sustainability issues. More generally, the OECD/DAC (1997) defines SEA as any defined processes by which decision-makers consider potential environmental impacts during the formulation, revision or appraisal of PPPs.

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tools have corresponded to SEA application. Some examples include technology assessment, land and resource planning, environmental reporting, and green economics (Sadler and Verheem 1996).

3.2.2. Gaps in Understanding SEA

SEA is a process that is still evolving and changing. The difficulties of conceptualizing it primarily relate to its role in promoting sustainability, SEA integration, the decision-making hierarchy to which SEA is applied, and SEA procedures. One school of opinion has held that SEA should merely concentrate on environmental issues to ensure they are mainstreamed into planning and decision-making. Others, by contrast, have stressed that SEA should move to provide a broader sustainability focus through incorporating social, economic dimensions as well as environmental ones within it (Eggenberger and Partidário, 2000; Dalal-Clayton and Sadler 2002). In terms of the relationship of SEA planning, opinion is divided on whether SEA should be used as a separate assessment process or as an integrated part of policy-making and planning processes (Kørnøv and Thissen 2000). It is also argued that SEA should clearly distinguish the SEA tasks and methodologies applied at policy, plan and program (PPP) levels (Fischer and Seaton 2002; Dala-Clayton and Sadler 2002). The following section provides an in-depth discussion on these three issues of concern.

3.2.2.1. Links between SEA and Sustainability

SEA has always been seen as a valuable means of pursuing sustainability. Sadler (1999) views it as a tool for "sustainability analysis" or for carrying out a "sustainability test". Thérivel and Partidário (1996) stress the value of SEA in designing sustainable policies and strategies. Sadler and Verheem (1996, p. 158) claim that SEA can be constructed as a process towards "sustainability assurance", an approach that focuses on maintaining the "source and sink" functions of national systems. Shepherd and Ortolano

(1996) relate SEA to sustainable urban planning, and identify six potential ways in which SEA can make a contribution to sustainability: the formulation of a framework of sustainability strategies; consideration of a wide range of alternatives; streamlining project-level EIAs; addressing cumulative impacts; early public involvement; and the establishment of monitoring and mitigation measures for adaptive environmental management. Similarly, Stinchcombe and Gibson (2001) note that SEA application operationalises sustainability principles; improves the information base for policy making; and facilitates greater transparency at strategic levels (Appendix 2, Table 1). The author argues that SEA represents both an entry point to, and the continuing groundwork for, truly integrative sustainability-based assessment. Kørnøv and Thissen (2000) recognize the duality of SEA, i.e. the twin roles, advocatory and integrative, which have evolved within its framework. As such, SEA can be applied to enhance environmental awareness from the outset through explicit provisions on environmental impact evaluation and mitigation or enhancement, and move to provide integrated assessment and sustainable policy support in a broad sense. The discretionary flexibility of SEA in this regard can assist practitioners in selecting an appropriate approach to SEA for the specifics of proposed initiatives.

Two schools of thought about the links between sustainability and environmental assessment exist in the SEA academic circles. Sheate (2003) suggests that SEA may be a sufficient tool for achieving sustainability if the integration of environmental considerations and decision-making is realized. Others argue that both EIA and SEA serve well as a sound basis for addressing broader sustainability concerns (Sadler and

Verheem 1996; Gibson 2002). SEA is a necessary but not sufficient condition for achieving sustainability, and should be linked to other policy instruments (Sadler and Verheem 1996). With reference to planning, Short *et al.* (2004) assert that implementing SEA in planning processes is only one of a number of elements in planning for sustainability. Gibson (2002, p.19) summarizes three "new or adjusted roles" which environmental assessment can play once it has adopted sustainability-based criteria:

- A mechanism for forcing attention to sustainability principles and a means of making positive contributions to achieving sustainability objectives;
- A process for specifying these principles—and associated values, objectives and criteria—in light of the specific context, through informed choices by the relevant parties (stakeholders); and
- A broader process for:
    - Identifying appropriate purposes and options for new or continuing undertakings;
    - Assessing purposes, options, impacts, mitigations and enhancement possibilities, etc;
    - Choosing (or advising decision makers on) what should (or should not) be approved and done, and under what conditions; and Monitoring and learning the result.

However, the potential of SEA for achieving sustainability may not be realized in the near future. Indeed, there is little consensus concerning the concept of sustainability. Moreover, the political systems of many countries fail to accommodate the fundamentals of sustainability. In addition, the amount of data needed to formulate PPPs may be overwhelming (Thérivel *et al.*1992; Glasson 1999). In practice, the attempt to use SEA to realize environmental integration may encounter resistance or opposition from decision-makers in both public and planning agencies, because planning is ultimately a political process in which choices are made through the interaction of competing interests (Novakowski and Wellar 1997). Stinchcombe and Gibson (2001) outline the ten barriers to the implementation of SEA, and suggest that these barriers can invalidate the

interpretation of the SEA's advantages in promoting sustainability (Appendix 2, Table 1). Benson (2003) further asserts that as long as a system of assessment is weak in dealing with public participation, issues of alternatives and uncertainty, the problem of cumulative effects, the diversity of value system, the issue of decision-making and the links from EIA to integrated environmental management, neither EIA nor SEA can offer a tool for sustainable planning. Pope *et al.* (2004) and George (2001) suggest that plans should be assessed not only for their contribution to sustainability, but also to evaluate whether or not they are, in themselves, sustainable. Sheate *et al.* (2004) contend that there is a need to debate the relative merits of SEA and sustainability appraisal as tools for promoting sustainability. Based on their study of the land-use planning practice in the UK, Sheate and his colleagues argue that the key aspects of sustainability are too readily lost if SEA is substituted for sustainability appraisal. Substantively, sustainability appraisal requires a neutral position and a balanced ability of assessors and decision-makers to understand the various issues in question and what is at stake. In reality, decision-makers may sideline environmental concerns when priority is given to economic development. From a procedural perspective, sustainability appraisal may sacrifice depth of an environmental impact investigation in order to achieve breadth of coverage.

3.2.2.2. Integration of SEA and Planning Processes

SEA and planning[2] are two closely related but separately evolved fields (Egggenberger and Partidário2000). The role of SEA in planning is a frequently debated

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[2] In this research, planning is perceived broadly to include conventional urban planning, "…a formal process of land management, guiding and controlling the built environment, civil engineering operations and certain change of uses", and the wider process of government plan and policy formulation, " a generic

question. Smith (1993, p.95) claims that EIA should become integral to environmental planning rather than simply serve as a check point. Accordingly, he defines EIA as "a process of environmental planning that provides a basis for resource management to achieve the goal of sustainability". The timing of EIA in planning processes determines its purpose, scope, and outcome (Armour 1990).Eggenberger and Partidário (2000) also argue that though SEA and planning have evolved separately, they comprise similar directions and common purposes. Therefore, SEA can play a significant role in enhancing sustainability concerns in policy and planning processes. Unfortunately, environmental assessment, at both the strategic and project levels, has typically been conducted apart from the planning process. Consequently, it either plays only an advisory role, or else it is used as an evaluation method to justify planning decisions rather than contributing in any meaningful way to them (Armour 1990; RCFTW 1992). SEA has also encountered a degree of resistance among policy-markers and planners. Experiences with SEA in some countries such as Germany show that it may lead to delays in the planning process (Stoeglehner 2004). In addition, some planners have argued that the broad principles of EIA are already incorporated in the planning and decision-making process and that the adoption of SEA would bring only marginal advantages. However, Eggenberger and Partidário (2000) question whether one critical aspect remains to be demonstrated: that is, whether such planning is actually carrying out systematic identification and integrated assessment of alternatives in an informative and accountable way.

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activity involving provision for future and the strategic and tactical allocation of human and physical resources" (Selman 1999, p.148).

It is possible to identify a number of benefits from integrating SEA with planning processes. Elling (2000) discusses the integration of SEA and regional planning in Denmark and concludes that integration has added value: it can increase the transparency of decision-making processes, and it can bring the planning process back to the political level. Stoeglehner (2004) considers the application of SEA to a community development plan in Austria, suggesting that if SEA is used as a planning tool, merging SEA and planning into a single decision-making process, it can potentially help to avoid delays in plan preparation. In a case study of the Pasquai-Porcupine forest management plan assessment in Saskatchewan, Canada, Noble (2004b) concludes that SEA can streamline the EIA and approval process, and enhance the deliverability and acceptability of the final plan. As far as developing countries are concerned, researchers from a study of the potential of SEA in Nepal found that the use of SEA could add strength to the environmental authorities because of its image of environmental protection and management, and its proactive influence on sector ministries. Others suggest that SEA at local planning level could increase coordination with other sector ministries, as well as policy and planning integration (Dalal-Clayton and Sadler 2004).

3.2.2.3. Links between Policies, Plans and Programmes (PPPs)

Given the diversity of planning and decision-making contexts worldwide, the term “strategic” implies a greater degree of inclusivity, ranging from policy visions to programs of more concrete activities. There is not yet a consensus about what actually constitutes PPPs, but an often-quoted distinction between the three terms is made by Wood and Dejeddour (1992, p. 6):

> A policy may… be considered as the inspiration and guidance for action, a plan as a set of coordinated and timed objectives for the implementation of the policy, and a program as a set of projects in a particular area.

PPPs can have a national, regional, local, or sectoral focus, but any strategic actions should deal with the concept of development, not with the specific location or technical design of a project (Wood and Dejeddour 1992; Sadler 1996; Partidário 1996). Partidário (1996) suggests that it is important to consider the strategic components of SEA such as the strategic nature of decision, the continuity of the decision-making processes, and the optional values. Noble (2000) stresses that the objective setting and nature of alternatives used are critical. For example, a truly strategic consideration of alternatives requires the assessment of alternative options instead of a consideration of option alternatives. The author contends that one strategic dimension of SEA entails that the process be adaptive, anticipatory, and particularly, reactive to the realities of the decision-making context. This strategic-reductive approach is widely used in adaptive (Holling 1978), strategic (Lang 1986), and bounded planning (Meadowcroft 1999).

In theory, a tiered approach best describes the relation between assessment at the strategic and project levels. In practice, however, these tiers are amorphous and hard to determine (Wood and Dejeddour 1992). For example, Fischer and Seaton (2002) explain that while the assessment of a new 50km highway is subject to EIA requirements in the Netherlands, a similar "project" is instead subject to SEA in Canada or England. The situation can result in additional development costs because the considerable knowledge gained from experience in the first system may be neglected by practitioners in the second system. Many authors advance a tiered approach to SEA applications. Fischer (2002) explores the land-use and transport planning systems in UK, the Netherlands, and Germany, suggesting that planning systems should be amended to allow for effective consideration of three types of SEA (Table 3.1). Baker and Fischer's (2003) note that a

tiered SEA system, involving both vertical integration (i.e. tiering between different decisions levels) and horizontal integration (i.e. tiering between and within sectoral bodies), is capable of reconciling the sustainability conflicts in English regional development. Dalal-Clayton and Sadler (2002) maintain that SEA at the policy level requires a more holistic approach. The challenges facing SEA at this level are securing the political and institutional will, and finding the key leverage points in the policy-making cycles.

SEA type	**Integration to PPP**	**Procedure**(screening, scoping, assessment report, monitoring, and follow-up participation and consultation)	**Substance** (from which SEA-type specific tasks can be derived)
Policy-related (e.g. vision)	Fully integrated	All stages in a flexible manner	Intermodal, fiscal and tax alternative, based on socioeconomic and environmental criteria; rather non-spatial
Plan-related(e.g. land-use plans, corridor studies)	Parallel	All stages in a structured manner	Transport corridors and spatial alternatives (land suitability, focus on likely to be on environmental aspect)
Program-related (e.g. compilation of concrete projects, "action plans")	Fully integrated	All stages in a structured manner (participation of the general public)	Sector-specific projects and finance program; identification of priority projects, based on multi-criteria analysis or cost-benefit analysis

Table 3.1 SEA Types and Characteristics
Source: Fischer and Seaton (2002)

3.3. SEA AS A MEANS OF PROMOTING SUSTAINABILITY

Although the above issues regarding use of SEA have remained unresolved and, more seriously, impeded rapid adoption, the base of literature is growing and provides theoretical background as well as practical guidelines on SEA application. This section considers a number of sustainability principles for SEA undertakings.

3.3.1. Theories and Principles of Sustainability and Planning

The starting point of most sustainability debates is a description from the report of the World Commission on Environment and Development (WCED, 1987), which highlighted two key points: the matter of intergenerational equity and the need to limit development to that which is a necessity:

> Development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987).

Mitchell (2002, p. 73) notes that the Commission's definition is anthropocentric. A different view to this human-centered definition is that sustainability considers the biophysical reality and the limits it poses on human activities (Meadow 1992). Goodland (1995) defines environmental sustainability as the maintenance of natural capital through considering the use of renewable and non-renewable resources on the source side, and pollution and waste assimilation on the sink side. The predominant pillar approach divides the development issues into a number of components: ecological, social, economic, cultural and political. Sustainability occurs in the intersection of components, "where the human and ecological imperatives coincide" (Gibson 2002). Sadler (1999, p.19) holds that sustainability is represented "as a commonwealth of values" and "integration of perspectives." Based on this pillar approach the Swiss Federal Statistical Office (2002) stresses that sustainability necessitates an effort towards three target dimensions, that of "Social Solidarity", "Economic Efficiency" and " Ecological Responsibility". However, the pillar approach has been criticized for being divisive and

reductionist, and tending to emphasized trade-offs between pillars (Hacking and Guthrie 2006, Gibson 2002, 2007).

Instead of attempting to define what sustainability is, many authors have sought to develop a set of more general and overarching principles of sustainability to guide EIA and SEA applications that can be adapted to the specific context (for example, Gardner 1989). The views held by authors like Jacobs (1999) and Herman and Knippenberg (2006) explain the incentive behind this effort, stating that sustainability is a concept which is broadly accepted as important, and even if substantial disagreement exists over the exact definition, the core ideas are fixed. Another rationale has been that without such key core principles it is not possible to determine if sustainable development is present or not in a policy, practice or an initiatives (Mitchell 2002).

Among them, George (1999, 2000) considers the twin principles or pillars of **intra- and intergenerational equity** of sustainability and relates them to the principles of EIA and SEA. As "an omnibus test of whether or not development is sustainable" (Sadler 1999, p.18), intergenerational equity requires that the next generation inherit a stock of assets no smaller than that passed on to us. Intragenerational equity emphasizes a real improvement in the welfare of all people, especially the poor and disadvantaged, as the overriding priority. Strictly interpreted, intragenerational equity is a contingent principle, referring to a form of development that is true or appropriate (Goodland 1995). George (1999) concludes that the twin principles alone can offer a complete set of criteria for testing sustainability (Table 3.2). However, he indicates that for the principles to be

operational, expansion on the twin equity principles is needed to clarify what is equitable. In developing such a set of extended criteria, George suggests that the principle of conservation of capital is helpful because the distinction must be made between conservation of natural and/or human-made capital, whether those be in the direction of strong or weak sustainability, to support decision-making in environmental assessment.

Intergenerational Equity a necessary condition for sustainability
Intragenerational Equity a necessary condition for development

Table 3.2 the Twin Pillars of Sustainable Development
Source: from George (1999)

Sadler (1999) advocates the use of "benchmark principles" to indicate overall development directions rather than details. Specifically, the supply- and demand-side principles of strong sustainability constitute a framework for EIA and SEA applications. On the supply side, the principles of carrying capacity, biodiversity, or ecosystem integrity identify the limits or thresholds of acceptable changes to natural systems, which can be applied to test development proposals for their consistency with this limit requirement. On the demand side, the **precautionary principle** is emphasized to consider the limitation, and to guide decision-making where there is uncertainty. In combination, Sadler (1999, p. 29) suggests, the two sides of the principles will "indicate the changes that are necessary to improve the performance of EIA and SEA as "front-line" instruments for sustainability assurance." The 1992 Rio Declaration on Environment and Development from the Earth Summit also endorsed the utilization of the precautionary principle in order to achieve sustainability. The principles stipulates that where there are

threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing measures to prevent environmental degradation (Rio Declaration, Principle 15, 1992). Although the precautionary principle provides a general approach to complexity and uncertainty reading environmental problems, there is as yet no consensus reading both a definition and criteria for implementation. But Mitchell (2002, p36) states that "…it does provide a counterbalance to the 'wait and see' attitudes that often prevail."

Along the similar line, Hermans and Knipperberg (2006) employ a principle-based theoretical approach to develop a framework of sustainability criteria. They identify two main principles for testing sustainability: ***justice*** and ***resilience*.** The authors relate the two notions to the work on justice by John Rawls and resilience by C.S. Holling (1978). Considering the practical implication, they stress that it is impossible to evaluate one principle against another and to develop the trade-off rules for decision making. Therefore, in their view, a participatory integrated assessment (PIA) is a promising approach to normative discussion on trade-offs in an assessment context by involving all stakeholders and experts in the process. ***Efficiency*** is viewed as a third essential concept for testing sustainability where trade-offs between competing goals are inevitable due to the limitation and availability of resources. However, Hermans and Knipperberg reject the concept of efficiency as a potential core principle of sustainability. In their view, efficiency is a very broad concept and has multiple forms. For the concept to be operational and practical, the relevant context for application must be incorporated. As Jollands (2006, p. 371) notes there is no one concept of efficiency "because of the

context-dependent, interlinked nature of efficiency." In general, Jollandds (2006) categorizes three types of efficiency, i.e. thermodynamic efficiency, ecological efficiency, and economic efficiency. Nevertheless, in practical situations, where frequently or not there is time, financial, and means limit, efficiency in its multiple variations should be an indispensable condition of implementing sustainability (Hacking and Guthrie 2006). For instance, efficiency is one of the core criteria in Gibson's sustainability principles, which considers reducing overall material and energy demands and other stresses on socio-ecological systems. Including the efficiency principle, Gibson (2002) identifies a set of seven key general principles from which the criteria for environmental assessment can be derived elaborated and be applied to varying circumstances (Table 3.3). The rationale for this effort has been that the pillar-based approach tends to emphasize the potential competing interests rather than the linkage and interdependencies between the components. Therefore, the principles set out in the Gibson's work depart from the pillar conventions in order to stress the key changes generally needed in the pursuit of sustainability, each of which is illustrated in Table 3.3. This list was modified by Gibson and his colleagues (2005) and intergenerational and intragenerational equity are stressed and presented as two outstanding principles. It's worth noting that development of a general set of principles for SEA should identify potential SEA users and allow further specification of criteria depending on the context. Verheem and Tonk (2000:177) suggested that 'specific design for specific use increases the effectiveness of SEA processes.'

Integrity
Build human-ecological relations to maintain the integrity of biophysical system in order to maintain the irreplaceable life support functions upon which human well-being depends.
Sufficiency and opportunity

Ensure that everyone has enough for a decent life and that everyone has opportunity to seek improvements in ways that do not compromise future generation's possibilities for sufficiency and opportunity
Equity Ensure that sufficiency and effective choices for all are pursued in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, etc.) between the rich and the poor.
Efficiency Reduce overall material and energy demands and other stresses on socio-ecological systems.
Democracy and civility Build our capacity to apply sustainability principles through a better informed and better integrated package of administrative, market, customary and personal decision-making practice.
Precaution Respect uncertainty, avoid even poorly understood risks of serious or irreversible damage to the foundation for sustainability, design for surprise, and manage for adaptation
Immediate and long term integration Apply all principles of sustainability at once, seeking mutually supportive benefits.

Table 3.3 General Principles of Sustainability
Source: Gibson (2002)

In contrast to a theoretical approach to develop a framework of sustainability criteria as we discussed above, the Rockefeller Foundation's Study and Conference Center in Bellagio brought together a group of SEA practitioners and researchers in November 1996 to review progress to date and to synthesize insights from practical ongoing efforts. The outcome of this Bellagio Conference was referred to as the Bellagio principles, which were designed for starting and improving the assessment activities for all types of organizations and institutions in all continents (Hardi and Zdan 1997). It contains ten key principles and deals with four key aspects of sustainability assessment. The starting point of any assessment toward progress for sustainability is to establish a clear and well-defined vision for sustainable development; the content of any assessment should have a sense of the overall system with a practical focus on current priority; the assessment process should be accountable, and participative; and there is need for institutional capacity building (Hardi and Zdan 1997). These principles are pragmatic expression of core values of sustainability and intended to guide SEA practice.

In practice, various sustainability-based assessments have occurred at many levels. The following are some examples. The ***Indicators of sustainability*** serve two purposes: they can provide a sound basis for planning regarding problem identification, allocation of resources and policy assessment; they can also inform the public of progress through notification, mobilization, and legitimization of policy measures (Kuik and Verbruggen 1991). Kline (1997) discusses the value of developing community indicators of sustainability based on the concept of a sustainable community's encompassing economic security, ecological integrity, quality of life, and empowerment with responsibility. In Ontario, Canada, the City of Hamilton-Wentworth's sustainable community initiative, Vision 2020, has a goal against which all decisions made by government, business, community groups, and individuals can be measured. The community, as a whole, has been given the opportunity to be part of the decision making process. The Sustainable Community Indicators Project developed by the municipality contains thirty five indicators which monitor the city's progress in relation to Vision 2020 (Roseland 2001). In contrast, in Chongming County, China, the sustainability indicators developed by local people place a greater emphasis on economic growth when compared with the local indicators of some European cities. But they show a similar degree of concern over environmental issues (Yuan *et al.* 2003).

Hezri (2004) reviews the national sustainability indicator system and its integration with the policy process in Malaysia, and concludes that there are four implementation constraints: meta-policy issues; technical capacities; communication concerns; and theoretical limitations. ***Integrated appraisal*** emerged in the late 1990s to overcome a number of difficulties created by the proliferation of different specialized

forms of appraisal. It incorporates interconnected economic, social and environmental criteria in appraisal procedures and methodologies for the purpose of the achieving sustainability (Lee and Kirkpatrick 2000; Noorbakhsh and Ranjan 2000). The approach calls for establishing the scope of the integration agenda, identifying and classifying the main components within it, and clarifying the relationship between these components. Some integration measures are recommended. These include harmonizing the timing of different appraisal procedures (Scholten and Post 2000); including other "cross- cutting" issues in the broad assessment (Brown 2000); combining three appraisal paradigm approaches (Hulme and Taylor 2000); and conducting empirical studies in developing countries (Leslie 2000; Cooper and Elliott 2000).

3.3.2. Planning Theories and Practice

Planning theory and EIA have much more to offer than is documented in the literature. As Lawrence (2000, p.607) states:

> The limited and sporadic interaction between EIA and planning theory has meant that EIA has largely failed to benefit from planning theory insight and lessons. Obstacles and dilemmas already encountered and addressed in planning theory are still hampering EIA theory building and practice.

Synoptic/rational comprehensive planning is the dominant theory in planning practice and the point of departure for most other planning theories (Hudson 1979). This theory assumes planning to be the application of rational procedures of thought and action (Faludi 1973). Synoptic/rational planning, also referred to as a procedural planning model, consists of a series of systematic steps: identification of needs, specification of goals and objectives, development of alternative means, estimation of the costs of each

alternative, and selection of the most promising alternatives (Smith 1993). The main criticism of this theory is that planning is confined to a "technical, value-free, apolitical activity" with little or no consideration of the local socio-economic and political climate (Beatley 1989). The conventional EIA process parallels the rational planning process. In this model, objectives and criteria for evaluating projects are predetermined, and EIA is viewed mainly as a technical product, using scientific techniques to predict the impacts while requiring the professional expertise. On the plus side, the EIA process can successfully marry process and substance (Bartlett 1997), and make use of the rational planning process (Lawrence 2000). But it ignores politics, and models decision-making in an unrealistic way. Therefore, EIA becomes increasingly unrelated to actual decision-making (Formby 1990). Moreover, it does not serve to address the main environmental concerns.

Several alternative theories of planning have been developed out of criticism of the synoptic/rational approach. ***Incremental*** theory builds upon the work of Charles Lindblom (1979) and Herbert Simon's notion of bounded rationality (1957). The incremental approach describes how things often happen in practice and concentrates attention upon better-known experience while limiting the number of alternatives to be considered (Mitchell 2002). Policy-making is a serial or sequential process involving bargaining and negotiation among a plurality of interests and values (Lawrence 2000). On the basis of incremental theory, EIA can adopt a flexible procedure to ensure impact analysis and deliberation but it is unable adequately to address issues of cumulative impacts as well as major and long term choices. The central idea of ***transactive*** theory is

that planning is a process of mutual learning, with information exchange and action interaction amongst stakeholders (Friedmann 1973). The theory places a high value on experiential learning and interpersonal dialogue, creation of partnerships, and integration of local knowledge systems and planning. Accordingly, plans are assessed in terms of the ways in which they affect local people, such as their value and behaviors and their capacity for growth through cooperation (Hudson 1979; Mitchell 2002). The ***advocacy*** approach is characterized by pluralism (political power distributed among competing groups), and greater concern with the poor and disadvantaged (Davidoff 1965; Marris 1994). Under advocacy theory, planning and EIA processes promote full public participation in plan-making, and require the development of a plurality of plans (i.e. opponents of proposals develop their plans rather than amending those of the proponent). As Gibson (1990) notes, the bias of a proponent in support of his/her own interests and proposals implies that an effective EIA process has a somewhat adversarial character. The shift to a view that planning and EIA are critical social-political processes has led to more explicit consideration of conflict, social and environmental justice, and community empowerment (Gagnon *et al*.1993; Reed 1994). As such, EIA can incorporate stronger social and environmental justice and equity principles into the process, fostering greater sensitivity to issues of power imbalances and resource redistribution.

It is clear that no single planning theory can be effective on its own; each has merits and shortcomings, and each requires parallel input from others (Hudson 1979; Barrett 1999). A planning model of EIA[3] takes its theoretical guidance from rational

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[3] In contrast to a technical model of EIA stemming from rational planning, a planning model of EIA (1) involves consultative and participatory approaches; (2) addresses all levels of development proposals; (3)

planning, mixed scanning, transactive and advocacy planning, thereby demonstrating greater promise for promoting sustainability. Using Viet Nam as a case study, Doberstein (2004) concludes that promoting EIA capacity-building programs and a planning model in developing countries presents an opportunity to transform their development planning processes. Views are divided over SEA practice and planning theories. Thérivel and Partidário (1999) suggest that SEA practice needs to echo a communicative turn in planning theory, and move from a technical, rational approach to one which reflects a collaborative, consensus-making approach. On the other hand, Fischer (2003, p.155) defends the traditional technical method and normative approach to SEA. He argues that "leaving the design of flexible SEA to the will of proponents and stakeholders might ultimately render it incapable of protecting the environment." Richardson (2005) contends that the concept of power, value and ethics are inescapable in SEA theory and practice. SEA should consider where and how value conflicts and differences are being or could be dealt with.

3.4. INTEGRATING SUSTAINABILITY AND PLANNING

The previous sections presented a number of theories and principles regarding the use of SEA as an effective tool for progress towards sustainability. The question that arises from the above discussions is how to merge the three elements (SEA, sustainability, the planning process) into one development framework. An integrated SEA process should ensure that an environmental assessment of all strategic levels of PPPs, consider

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incorporates a multiplicity of forms of knowledge and information; (4) stresses uncertainty, precaution, and adaptation; (5) promotes EIA as a continuing planning process; and (6) attaches greater importance to public participation (Doberstein 2004, p. 285).

the inter-relationship of ecological, social and economic aspects, and is tiered to policies, project EIA and decision-making (IAIA 2002). The following section looks into an integrated framework for SEA application.

3.4.1. An "Integrated" Framework

Integration is a complex concept that has different dimensions. It brings a new entity to the long-established planning process, one by means of which new relationships are established (Eggenberger and Partidário 2000). Armour (1990) describes four imperative tasks of EIA integration, and the barriers to achieving those tasks, if the rhetoric of the integration is ever to be translated into more of a reality. These include the technical/disciplinary task, the consultative task and the organizational task, as well as integration of planning and decision-making processes. None of these tasks is easy (Armour 1990; Eggenberger and Partidário 2000). First, there are financial constraints, disciplinary chauvinism, data incompatibility, and the lack of integrative research methods. Second, there are difficulties in communication and in resolving conflicts among stakeholders, and more particularly, the divergence in perceptions of the relative merits of economic development and environment protection among the public and the decision-makers. Last, the failure may be due to fragmented jurisdiction, multiplicity of agencies, narrow incrementalism within the planning system, or political unwillingness.

With reference to effective models of integration, Glasson and Gosling (2001) suggest that there is a set of possible models of SEA and planning, ranging from very limited integration to full integration. In the ***incremental*** model, the application of EIA is

extended to elements of a plan; the ***stapled*** model undertakes SEA at a specific stage of the planning process; the ***concurrent*** model integrates SEA into various stages of planning while the ***holistic*** model is the ideal full integration of environmental concerns into the planning process to the point where a formal process is unnecessary.

Sheate *et al.* (2003) categorize four broad integration models of SEA based on case studies in European countries. Whereas ***policy-analysis/appraisal*** and ***EIA-inspired*** SEAs tend to be less effective at integration because they are either poorly informed or take place outside strategic decision-making, ***integrative*** SEA is often advocated as the optimum form that can include environmental consideration throughout development planning; co-ordinate input horizontally and vertically from different institutions; and provide a communication framework within which integration can be prioritized. ***Ad hoc*** mechanisms lack a systematic process for environmental considerations, but they entail the design-for-purpose characteristic.

Eggenberger and Partidário (2000) summarize the five forms of integration when dealing with development planning and assessment (Appendix 2, Table 2): ***substantive integration*** considers not only physical issues but also social and economic problems; ***methodological integration*** deals with coordinating different assessment approaches; procedural integration adopts co-ordination, co-operation and subsidiarity as guiding principles among agencies; ***institutional integration*** involves the provision of capacities, the definition of integration organization, effective communication and the interventions between the agencies; and policy integration ensures sustainability as overall guiding

principles in planning and assessment and integration of sector regulations and strategies. Eggenberger and Partidário (2000, p. 206) suggest that the five forms of integration may be used as a framework to "register current experience and solicit case examples." The use of the framework may lead to the identification of what constitute good opportunities and constraints for integration, and consequently may result in the development of a framework that can be of benefit to planning and impact assessment practitioners at various organization and institutes. Of five forms of integration, institutional integration is of particular significance for the research because it defines the extent to which sustainability objectives can be put into practice.

3.4.2. Institutional Arrangements and Analysis

Institutional arrangements provide the structure for the policy-making process and affect the implementation of policies. Mitchell (1987) suggests that institutional arrangements give rise to a "definable system that provides both opportunities for, and constraints upon, policy-making." It is these institutional arrangements that define the role played by EIA in planning and resource management (Smith 1993). Based on a case study of integrated resource management in the Hunter Valley, New South Wales, Australia, Mitchell and Pigram (1989) propose an analytical framework consisting of six interrelated aspects: context, legitimation, management functions, administrative structures, process and mechanisms, organization culture and participant attitude. Each provides a leverage point where opportunities exist to improve integration. In their view (1989, p.198), the purpose of an institutional analysis is to "identify and assess the

leverage points at which it is possible to improve resource management". Smith (1993) modified this framework and applied it to EIA case studies (Figure 3.1).

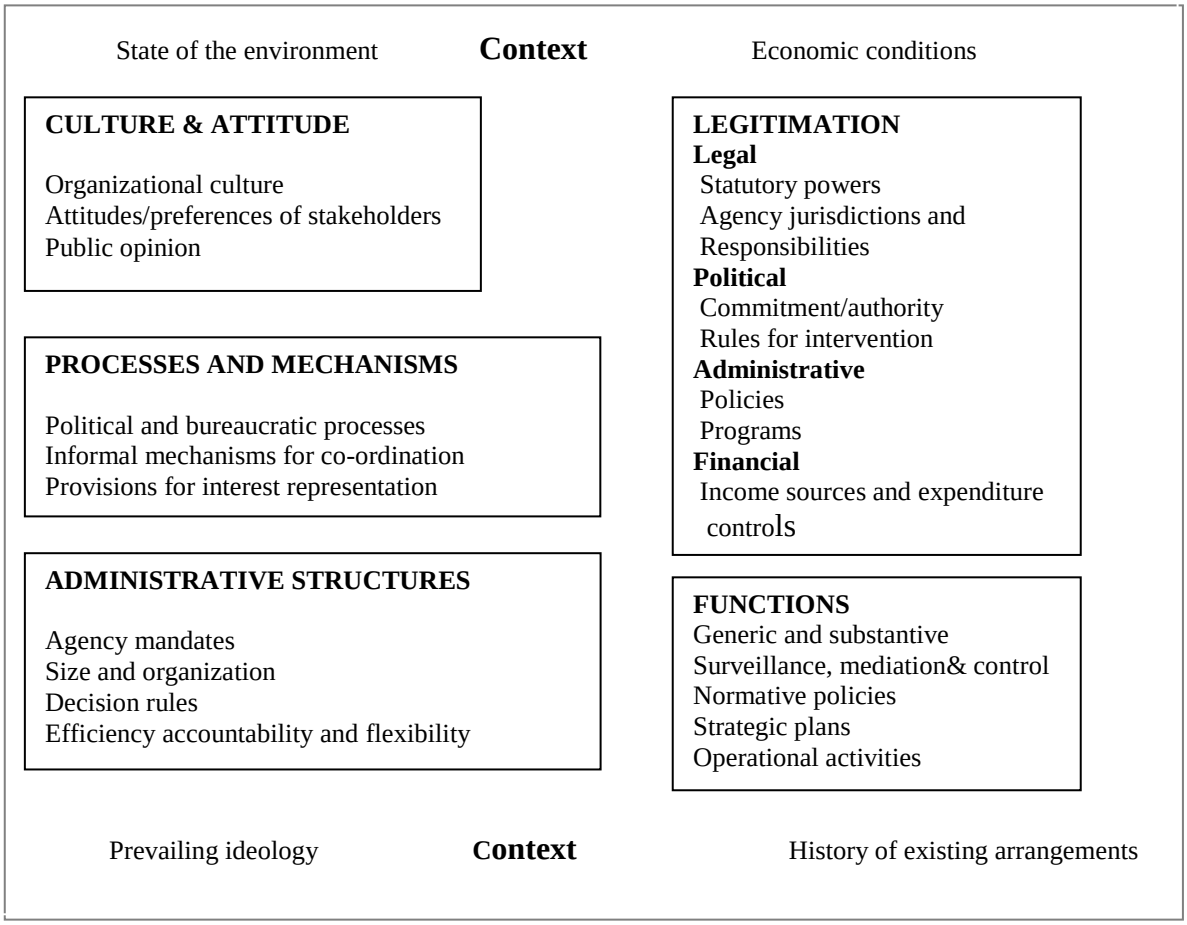

Figure 3.1 An Analytical Framework for Institutional Arrangements
Source: Smith (1993)

Specifically, context defines the opportunities and constraints provided by broad contextual aspects; legitimation relates to the presence of statutory powers, political commitment, objectives and responsibilities; functions considers which management functions are assigned and at what scale; structures are the provisions of mandates and decision rules; processes and mechanisms are necessary to facilitate bargaining, negotiation and mediation; ultimately, integration and co-ordination depend to a large

extent on organizational culture and participant attitudes (Mitchell *et al.* 1989; Smith 1993; Glasson and Gosling 2001).

Of the two major problems that limit the implementation of SEA, the institutional barriers, in many circumstances, are more severe and more complicated than the technical difficulties. Wood (1995) has noted that bureaucratic origination greatly hindered the successful SEA applications. Glasson (1995) also has suggested that there are observable political/institutional willingness problems because governments and agencies are unwilling to engage in the co-operative, open activities that SEA requires. In Sadler and Verheem's view (1996), the pre-requisites for SEA are established by the prevailing political/organizational culture and by the structure of decision making. They have identified a list of eight institutional barriers that are interrelated and mutually reinforcing. Similarly, they have emphasized that political will or support to SEA processes may be the only real precondition. Specifically, some institutional barriers to the implementation of SEA identified by Sadler and Verheem (1996, p. 77) are:

- Insufficient political will—as indicated by low priority given to environmental concerns, public participation and integrated decision making;
- Lack of clear objectives—e.g. absent or incomplete direction given to incorporating environmental goals into sectoral policies, plans and porgrammes;
- Narrow definition of issues—reflected in prevailing emphasis on economic growth and failure to consider the strategic environmental implications;
- Compartmentalized organizational structures—typically, consideration of environmental matters is curtailed by the sectoral division of political powers and agency responsibilities;

- Absence of accountability—often, economic agencies are not held responsible for the environmental implications of their actions;

- Lack of incentive—policy makers and their senior advisors are seldom rewarded for anticipating and avoiding environmental problems; on the contrary, taking these into account usually generates additional pressures;

- Exigencies of decision-making—often political stresses dictate a fast response to events in which there is too little time to review and weigh economic consequences, let alone environmental ones; and

- Bureaucratic prerogatives—environmental requirements encroach on "turf and territory" of other sectors, which zealously guarded by officials, especially at the policy level.

Glasson and Gosling (2001) have examined the issues listed above in their study of SEA and regional planning in Denmark, the Netherlands, Spain and the UK. Their findings suggest that the politico-environmental lobby and the structure and relative powers of the executives are two dominant factors that give rise to variations in SEA. The institutional barriers—political will, compartmentalized organizational structures, exigencies of decision-making and bureaucratic prerogatives—have been revealed in the cases they studied. Institutional arrangements have been of particular significance in Canada because of the division of power and responsibilities between the federal government and the provinces (Smith 1993; Holland 1996). The relevant research has been carried out, such as a comprehensive review of the legislated EIA process in Ontario (Gibson 1990); a study of the effectiveness of institutional changes to EIA in British Columbia (Smith 1988); and case studies of integrative EIA processes in hydro projects and the pipeline and transmission line planning (Smith 1993).

3.5. ASSESSMENT OF PROGRESS TOWARDS SUSTAINABILITY

There is a multitude of approaches to SEA, each with a SEA-related term or label, differing in their openness, scope, intensity and duration. Verheem and Tonk (2000) contend that these differences originate from the specific policy and institutional context in which they are being used. They may be formal or informal, comprehensive or limited in scope, and closely linked with or unrelated to policy and planning tools. Table 4 in the Appendix presents a variety of forms currently practiced worldwide. The variations in SEA, both in terminology and approach, reflect the growing range of type and context covered by policies, plans and programs in decision-making. They also indicate the predominant rejection of SEA being conceptualized as a narrow assessment instrument on the part of practitioners (Dalal-Clayton and Sadler 2002).

There is no clear agreement on "good SEA practice" or on how such practice can be achieved. It is widely acknowledged that appropriate forms of SEA largely depend on the specific context to which it is applied (Thérivel and Partidário 1996; Verheem and Tonk 2000; Brown and Thérivel 2000). However, attempts have been made to provide general principles of best practice. For example, Partidário (1997) outlines six rules of best SEA practice; IAIA (2001) requires that SEA performance be tested on the basis of whether it is integrated, sustainability-led, focused, accountable, participative and interactive. Verheem and Tonk (2000) call for SEA principles to be constructed in the form of goals. Partidário (1999) combines the principles proposed by Sadler (1996), and redevelops a set of comprehensive principles: those to do with policy framework, the institutional, and the procedural. The literature also provides some examples of practice

that have proved innovative, inspiring or effective at least in their own contexts. Sadler (1996, p.150) summarizes some of the directives from several countries with SEA experience, including:

- Keep things simple to start with (Denmark);
- The initial purchase on policy setting is the biggest gain (Hong Kong);
- Follow the least complex procedure possible, consistent with compliance (the Netherlands);
- Allow for discretion and flexibility of approach (Canada, EU); and
- Exploit the opportunities in project EIA to influence policy and initiate SEA (Western Australia).

The empirical studies undertaken in different part of the world augment these points of views. In South Africa, the SEA approach focuses on environmental conditions, and identifies the potential constraints for development activities. In this context, Rossouw *et al.* (2000) assert that the absence of a unified definition of SEA may not be an obstacle if some generic principles are followed. Harvey (2000) provides a complementary view in his study of SEA-type applications in the southern Australian coastal zone, where following a number of general principles has contributed to the realization of environmental objectives. In reviewing Swedish transportation planning, Brokking *et al.* (2004) point out that the SEA practice has been influenced by the ambiguity of the scope and structure of SEA. Therefore, national guidance and guidelines in SEA applications are important. Brook *et al.* (2004) report on a project undertaken in South West England, concluding that improvements to the SEA process are needed in terms of clearer screening requirements, better environmental baseline descriptions, clearer links between different plans, a better consideration of alternatives, more rigorous assessment of environmental effects and improved quality assurance. Aschemann (2004) discusses the lessons learned from Austrian SEA case studies, and suggests that good

communication and participation is of fundamental importance to SEA effectiveness. In addition, if SEA is perceived as being too "abstract", the result may be low compliance. At the local level, linking SEA and sustainability requires additional support and resources. Devuyst (2000) maintains that with the exception of a few places (for example, San Francisco, California, Germany and Hong Kong), SEA has hardly been applied at the local level. Issues of concern are financial and technical support, the motivation of local authorities, the disputed value of SEA, and lack of understanding of SEA. Based on his study of the municipalities in Belgium, Devuyst (2000) suggests that adoption of SEA at the municipal level requires support from the outside, impact assessment training, a simple, flexible and hierarchical EIA system, and integrative approaches. Alshuwaikhat (2005) further asserts that the SEA system for the municipal level should be incorporated into the national and regional systems. The following section looks into Canada's experience with SEA and how sustainability strategies are tied up with SEA applications.

3.5.1. Canadian Experience in Sustainability Assessment

Environmental assessment is a relatively high-profile process in Canada. Wood (2003) indicates that one reason is that the Canadian government views the EIA application as one of the most visible manifestations of its commitment to the environment. In addition, it can provide the best available opportunities for public participation in environmental decision-making.

The Canadian federal EIA system was established on a policy basis in 1973. Over the years, the Canadian EIA system has evolved and been significantly refined. The

most progressive expansion has taken place in the role and scope of the EIA process (Sadler 1990). Gibson (2002) suggests that these changes are notable in nine ways. The process now takes place earlier in the planning process; it is more open and participative; more comprehensive; more mandatory; more closely monitored; more widely applied; more integrative; more ambitious; and more humble. However, it was not until 1995 that the proclamation of the Canadian Environmental Assessment Act (CEAA) established a legislated and tightly prescribed EIA system. Since the late 1980s the use of EIA for the pursuit of sustainability has been high on the political agenda (Sadler and Jacobs 1989). Two recent panels deserve highlighting here. Both the Voisey's Bay and Red Hill Creek assessment panels required the proponents of the two projects to provide evidence that their undertakings would make a positive contribution to sustainability and respect for precautionary principles. These panel initiatives indicate not only that the decision-making criteria for reviews under the CEAA have become more ambitious, but also that the EIA process is itself capable of moving towards sustainability assessment (Gibson 2000, 2002b).

Canada has had a mixed degree of success with SEA application. The SEA process became a formal but non-statutory procedure in 1990 through Cabinet Directive, making Canada one of first countries that established SEA system in the 1990s. It is usually undertaken at the federal level and separate from EIA legislation for the purpose of flexibility and pragmatism. The early application of SEA was unsatisfactory and problematic, with a low compliance rate across many branches of the Government of Canada and the poor quality of SEA reports. The insufficient awareness of the SEA

process and challenges presented by SEA because of Cabinet secrecy and ministerial discretion were two barriers (Dalay-Clayton and Sadler B, 2005). The Commissioner of the Environment and Sustainable Development conducted an audit of the SEA performance of federal agencies in 1998 and this led to a revised Cabinet Directive on SEA in 1999 that clarifies obligations of departments and agencies and link the assessment with sustainability strategies. Subsequently, the Canadian Environment Agency (CEAA, 2000) issued updated guidelines for effective SEA application. The guidelines include the guiding principles, the advice on conducting SEA process, key issues of pubic concerns as well as the role and responsibilities. The guidelines were incorporated into the updated Cabinet Directive that was put into effect in 2004 (Box 3.1), which was influenced by the report entitled 'Beyond Bill C-9: legislated requirements for SEA" prepared by Canada the House of Commons Standing Committee on Environment and Sustainable Development in 2003.

Guiding principles

When implementing SEA, departments should be guided by seven principles

- **Early integration** - begin early in the conceptual planning stages of the proposal, before irreversible decisions are made;
- **Examine alternatives** - evaluate and compare the environmental effects of alternatives in the development of a new PPPs;
- **Flexibility** -. Departments and agencies have discretion in determining how they conduct SEA and are encouraged to adapt and refine analytical methodologies and tools ;
- **Self-assessment** - Each individual department and agency is responsible for applying SEA to its proposed PPPs, determining the appropriate approache, performing the assessment and reporting on the findings of the assessment;
- **Appropriate level of analysis** - The scope of analysis of potential environmental effects should be commensurate with the level of anticipated effects;
- **Accountability** – SEA should be part of an open and accountable decision-making process involves affected individuals and organizations, and uses documentation and reporting mechanism; and
- **Use of existing mechanisms** - use existing mechanisms to conduct any analysis of environmental effects, involve the public if required, evaluate performance and report the results.

Role and responsibilities

The major participants in SEA are:

- **Cabinet—**ensures that decisions fully reflect the environmental implications of the initiative;
- **All Ministers—** ensues that the environmental consequences of their PPPs are considered consistent with the government's broad environmental objectives and sustainable development goals;
- **The Minister of the Environment --**has a leadership role in establishing the environmental framework for Canada, and in promoting the application of SEA and a advising role for other ministers;
- **Departmental and Agency Officials—**ensures that environmental considerations are properly integrated into the development of PPPs;
- **Environment Canada—**consults with other departments and agencies and provides expert policy, technical and scientific analysis;
- **The Canadian Environmental Assessment Agency--**promotes the application of SEA at the federal level and provides guidance and training to improve the SEA implementation ; and
- **The Commissioner for the Environment and Sustainable Development—**oversees the government's efforts to protect the environment and promote sustainable development.

Box 1 Principles and Roles for Implementing SEA in Canada
Source: Canadian Environmental Assessment Agency (2006) The Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals is available at http://www.ceaa.gc.ca/016/directive_e.htm

International researchers also have taken increasing interest in Canadian SEA studies. For example, Shuttleworth and Howell (2000) examine the SEA application

within the Government of Canada, and argue that when properly applied and implemented, SEA is not an "add-on" requirement, but an integral component of sound decision-making. The key lessons from their study include using a simple, practical approach, applying the analysis as early as possible in the PPP development, and convincing policy makers and officers of the importance of SEA. Therrien-Richards (2000) analyses the SEA methods used in Parks Canada management plans, where a multi-disciplinary team approach in a workshop setting has been suggested as an effective and efficient process by which to conduct SEA. Further, Hazell and Benevides (2000) assert that the legislation of the Cabinet Directive on SEA can stimulate greater use of SEA. Gibson and Walker (2001) evaluate the Commission of Environmental Cooperation's (CEC) framework for assessing the environmental effects of the North American Free Trade Agreement (NAFTA), and suggest that a SEA evaluation framework should have a sustainability focus, ensure consideration alternatives, and encourage a more open and participative process. Noble (2002) maintains that a structured, systematic framework is required to guide the application of SEA at all levels. Marsden (1998) discusses the SEA application on legislative proposals in Canada, and concludes that relevant issues are renewed commitment from the Government, improved guidance, better coordination and general management of the process. Considerable variability exists in the provisions for, and practice of, SEA at provincial levels. At the provincial level SEA is also sometimes practiced, though often on an exceptional case basis. Formal SEAs or their equivalent have been undertaken under environmental assessment law in Ontario and British Columbia, under planning or land use law in several provinces, and through special inquiries in some provinces. The barriers to

effective implementation of SEA at the provincial level are the lack or weakness of legislative requirements for SEA, and the limited understanding of the nature and benefits of SEA (Noble 2004).

3.5.2. Planning Approaches and Practice in Canadian Cities

The traditional Canadian planning system can be characterized as being fully institutionalized and professionalized; comprehensive or regional in scope; and operated within the framework of the provincial-municipal relations (Graham *et al*. 1998). The main policy tools associated with urban planning processes are zoning, subdivision development, and development permits (Graham *et al.* 1998). The problems in linking planning efficiently with environmental concerns emerge in most provinces across Canada when the requirements of the Planning Act (PA) and Environmental Assessment Act (EAA) overlap (RCFW 1992; Richardson 1994). This difficulty has resulted in considerable duplication, delay and expense in the planning process. The Sewell Commission was established as one response to the need to streamline the planning process and tighten the links between land-use and environmental planning (Sewell 2001).

A spectrum of concepts and approaches has been applied to urban planning in Canadian cities. ***The eco-city*** integrates ecological sustainability with social justice and the pursuit of a sustainable livelihood. Roseland (1997) describes the concept as entailing three aspects: the acknowledgement of the ecological limits to growth, the need for promoting ecological, cultural diversity and a vibrant community life, and the support for community-based sustainable economies. Newman (1997) suggests that solution to the problems of cities relies on the incorporation of nature and local community. Three ideas

in town planning require rethinking: the positive view of urban density; mixed land use; and rediscovering both natural and localized community processes.

The Healthy Communities movement is another influential initiative towards achieving urban sustainability. The healthy community vision requires a shift from economic growth to human development. Hancock (1997) develops a conceptual model for community planning, which encompasses six qualities: conviviality; equity; economic vitality; ecological sustainability; environmental quality; and livability. The model requires a holistic approach that leads to new processes and political structures. Moore (1997) discusses the case of Vancouver's highly regarded "Clouds of Change Report", and concludes that the reasons that government initiatives tend to fail to produce the type of changes necessary for a healthy community in Canada can be reduced to three barriers: perceptual or behavioral, institutional and structural, and economic or financial.

An ecosystem approach is a departure from traditional environmental management in that it addresses the interaction of the biophysical and socioeconomic environment within a self-maintaining larger system (Grumbine 1994; Born and Sonzogni 1995; Slocombe 1998). The essence of an ecosystem perspective is two-fold: first the concept of a system itself, and second, the component parts of a system and the linkages among the parts (Mitchell 2002). Criticisms of the approach cite the difficulty of defining the location and boundaries of an ecosystem (Fitzsimmons 1996). Brody (2003) argues that while an ecosystem approach focuses on large spatial scales, implementation must occur at the local level, with local land use decisions. In the case of the

reorientation and restructuring reform by Environment Canada in the 1990s, the application of an ecosystem approach has given rise to superficiality. Therefore, it is important to distinguish between conceptual and operational decisions in an ecosystem approach, and to find an appropriate balance between breadth and depth for any particular situation (Mitchell 2002). An influential application of an ecosystem approach was provided by the Royal Commission on the Future of the Toronto Waterfront (the Crombie Commission, RCFWT 1992). The Commission advanced the idea of ecosystem planning, defining the study area on the basis of natural boundaries and referring to it as the "Greater Toronto bioregion", rather than in terms of political jurisdictions. Gibson *et al.* (1997) extended the work of the Crombie Commission, suggesting that ecosystem planning is a green alternative to conventional planning. The central strength of the ecosystem planning model is the integration of data and analysis in a way that pays sufficient attention to whole systems within natural boundaries.

In the early 2000s, the relationship between growth and development has been a central concern of Canadian's sustainability efforts. The **Smart Growth** agenda (Alexander and Tomalty 2002) was widely employed by provincial governments such as Ontario and British Columbia to reform development with principles of a sustainable, livable urban environment. A recent initiative is **Places to Grow** put forward by the Ontario government to achieve sustainability in a way that accommodates economic prosperity, environmental wellness and a high quality of human life (Ontario Ministry of Energy and Infrastructure, 2007). This new program stresses the importance of regional planning and balance between growth and development. Currently, the program hosts

two regional growth plans: Growth Plan for the Greater Golden Horseshoe (2006), and Growth Plan for Northern Ontario (discussion paper 2008).

3.6. A SUMMARY OF CRITERIA AND FRAMEWORK

3.6.1. Evaluation Criteria

This chapter presents a number of general principles that can be used to assess SEA progress towards sustainability. It also discusses some considerations about integration with planning. This section explains a set of criteria resulted from the above discussion and how they will be applied to the case study described in Chapter Four. The criteria were derived from the sustainable principles discussed in section 3.3.1, which identified the most significant and most widely recognized points raised and placed them in a list of aggregate criteria. The criteria were consolidated through defining the key considerations and elements involved in each criterion. These key points were also verified by cross referencing with the literature reviewed in the previous sections. The questions of key informant interviews and surveys were structured on the basis of this criteria set. However, it is very important to note that the advocates of approaches based on the application of core principles should recognize a need to specify and elaborate upon the principles for particular contexts of application. With respect to application of SEA in China, the advocate of adoption of the following general criteria is tentative. More detailed and context-specific versions of the criteria are needed to ensure that the main concerns of environment and sustainability are addressed in the particular place of application. The criteria for assessment progress towards sustainability in planning processes are:

1. Equitable

    - requires positive improvements to the welfare of all people, especially the poor and disadvantaged;
    - addresses sufficiency and opportunities of current generation in ways that do not comprise future generations' opportunities (George 1999, 2002; Gibson et al 2002, 2005; Herman and Kniappenberg 2006); and

2. Efficient

    - requires resource maintenance through avoiding waste and cutting material and energy use per unit of production;
    - concentrates on a limited number of key issues of development and provides sufficient and reliable information for decision-making;
    - conducts assessments on existing systems and seeks for time- and cost effectiveness (IAIA 2002; Jollands 2006; Gibson et al. 2005; Rotman et al 2001, Hacking 2006);

3. Participative

    - involves interested and affected public, professional, social groups and government bodies, as well as marginalized groups throughout the decision-making process ;
    - makes the data and information that are used accessible to all and communicate the relevant information to stakeholder;
    - ensures openness and transparency of the decision-making process (IAIA 2002; Gibson et al. 2002, 2005; the Bellagio Principle 1996);

4. Precautionary and Adaptive

    - respects uncertainty and avoids serious or irreversible damage to ecosystem;
    - seeks to restore and enhance the integrity of ecological and socio-ecological systems;
    - has adaptive capacity of learning and adjustment in face of uncertainty and external stresses;
    - considers development options and alternative proposals (Sadler 1999; Gibson et al. 2002, 2005; Herman and Kniappenberg 2006; Mitchell 2002)

5. Integrated

    - considers the well-being of social, ecological and economic aspects and its inter-relationship; and
    - considers environmental concerns at all strategic levels of decision-making and is tiered to policies in relevant sectors and regions to project EIA;

- conducts the assessment early enough to influence the decision-making and planning process;
- defines the duties and responsibilities of leading and participating agencies and ensures exchange of information and possibilities of interventions between agencies (IAIA 2002; Gibson et al. 2002, 2005; Eggenberger and Partidario 2000; the Bellagio Principles 1996)

3.6.2. Analytical Framework

The discussion of the extensive SEA and planning literature also helped with the development of conceptual and analytical framework for this study. It is suggested that the conditions that are to be met in any attempt to use SEA in support of sustainability must involve:

- a policy framework linking other policy tools and institutional contexts; credible and feasible alternatives that allow evaluation based on comparable rather than absolute values;
- recognition of the uncertainties that characterize any policy and planning development context;
- simple but pragmatic indicators that can assist in monitoring the assessment processes;
- good communication mechanisms to ensure that all partners in the SEA process are adequately involved and their perspectives considered (Partidário 1999, p.68).

In particular, Sadler (1997) identifies the important factors, including the clear and transparent provision for SEA, the prior record of implementation by decision-makers, and the degree to which overall sustainability strategies are put in place, and the scope and levels of application. It is also important to recognize that SEA is a necessary but not sufficient condition for achieving sustainability (Sadler and Verheem 1996). When linked, SEA and other policy instruments constitute a framework to address economic and social dimensions, integrating them with environmental concerns in

planning. Such an integrated approach can in turn, support and empower SEA (Figure 3.2).

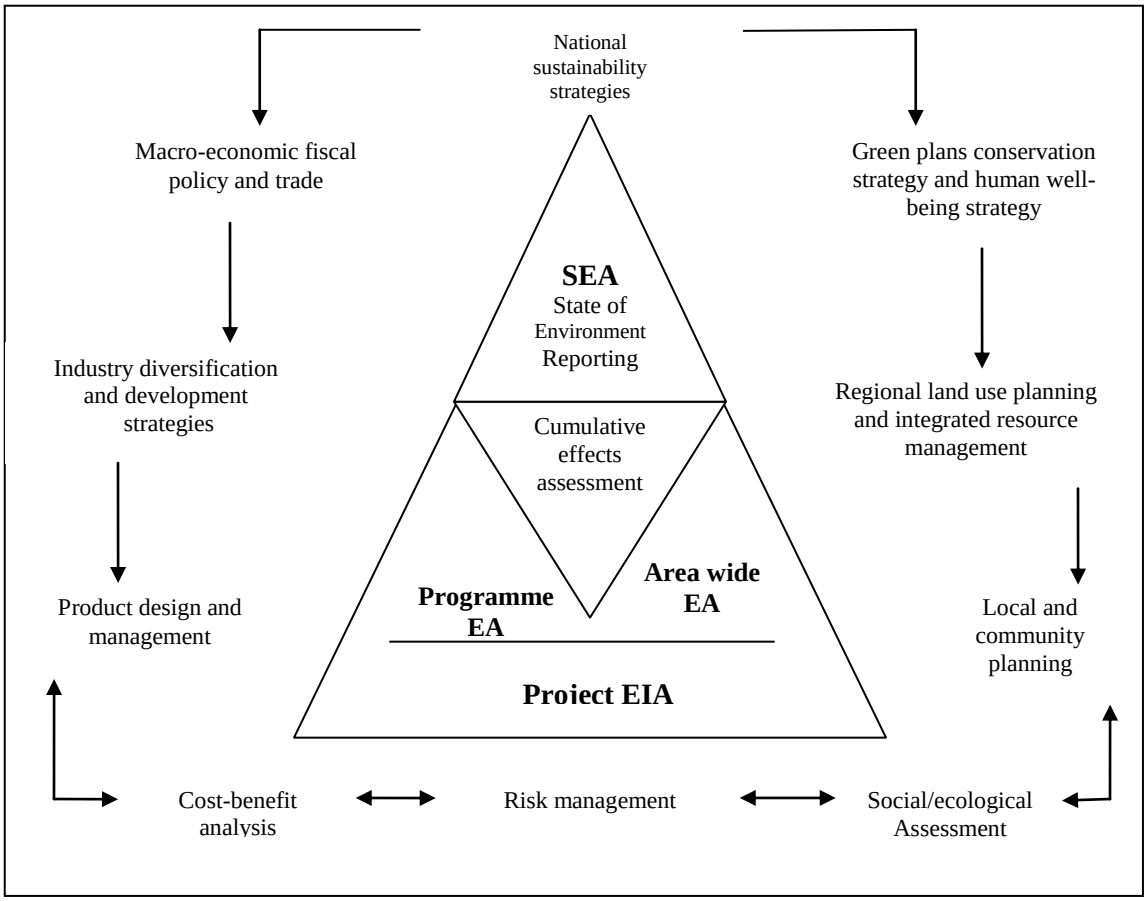

Figure 3.2 Integrated Approach to SEA—Policy and Project Linkage
Source: Adapted from Sadler and Verheem (1996)

The list of such preconditions can further be extended to include, but are not limited to, sustainability as a broad objective that requires "a truly different philosophical approach…[and not just] 'business-as-usual'"(Sheate 2003, p. 229); The integration of sustainability into EIA theory and practice should occur at three levels—the conceptual, the regulatory, and the applied (Lawrence 1997). An agreed framework of principles, criteria and indicators provides guidance for SEA and associated decision making and is linked to national sustainability policy and strategies (Sadler 1999). Most of all, there is a

need to examine policy-making and planning processes, and to study how SEA can be grafted onto the existing processes (Eggenberger and Partidário 2000; Sheate *et al.* 2003).

A conceptual framework hence is developed through including all these considerations as well as insights from the literature reviewed. The purpose of the framework is to synthesize these ideas and offer an analytical framework for this study (Figure 3.3). Environmental assessment and planning theory and practice have evolved along parallel but separate paths, with the former being nested within environment and resource management frameworks and the latter within that of planning and development. But the two fields have much more insights and lessons to offer to each other with regard to theory building and practice. More importantly, they share an ultimate goal of achieving sustainability. Theoretically, environmental assessment is a useful planning tool that fosters better decision making and understanding of options in development planning. When it's integrated into planning processes, environmental assessment, particularly at strategic level, is among the most promising venues for promoting progress towards sustainability. Adoption of a set of generic sustainability-based principles in SEA applications will facilitate such a process of integration and move toward the goal of achieving sustainability. Therefore, the framework presented below stresses the overriding role of sustainability principles in development planning and decision making. The sustainability-based principles should constitute not only the critical requirements for realizing sustainability but also the assessment criteria against which progress towards sustainability can be measured. Central to use of SEA as a tool for promoting the goal of sustainability is the integration problem. Integration in various

forms serves as an analytical framework within which to explore the dimensions of incorporating SEA into planning processes, and to define the requisite conditions for SEA as a means of achieving sustainability. Of five forms of integration, the institutional is the focus of this research, which determines the successes of an effort of applying SEA into planning processes in pursuit of sustainability.

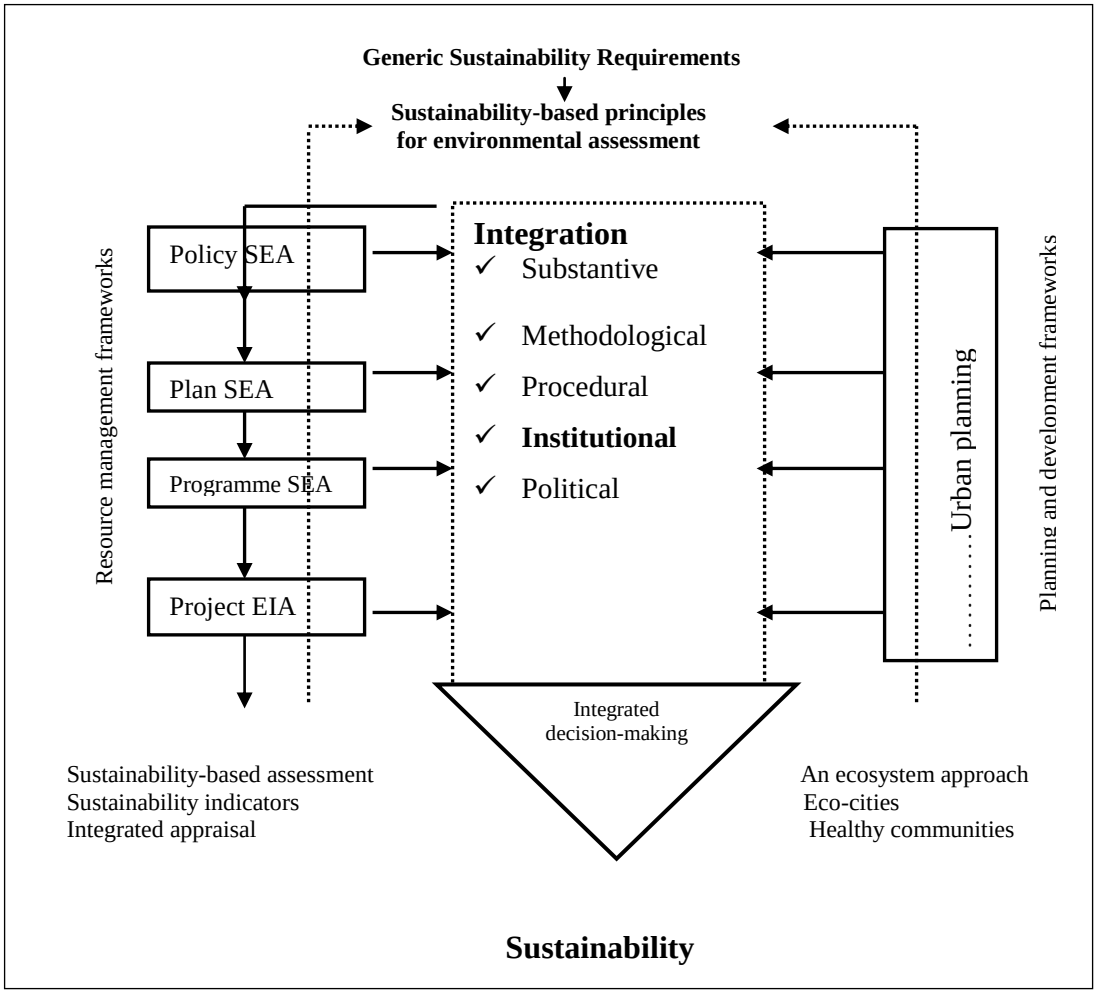

Figure 3.3 An Integrated Approach to Progress for Sustainability

3.7. SUMMARY

This chapter sought to build a broad theoretical framework for understanding SEA and its potential for facilitating efforts to make contributions to achieving sustainability in development planning. First, it explained how SEA has emerged out of criticism of project EIAs and responded to more effective approaches to the problems of sustainability. The main elements of the debate between SEA and sustainability include the degree to which SEA applications can contribute to the ultimate goal of achieving sustainability, integration of SEA with planning processes, and distinctions among PPPs. The second part of the chapter discussed the essential requirements or principles to follow for any progress towards sustainability. The discussion was based on an in-depth review of sustainability, SEA and planning literature and international practical experience broadly, with a particular focus on Canadian experience and literature. The five points of principle were then developed. These constituted a set of core requirements for SEA as a tool for progress towards sustainability. As a set of principle-based criteria for SEA, the five criteria were proposed tentatively for the purpose of applying into the Chinese urban context. A broad framework of integrating these requirements into planning, with a particular institutional considerations was introduced. The following Chapter will present Chinese environmental management and sustainability efforts broadly and the case study of applying SEA into the Dalian master plan for urban development (2000-2020) in particular.

CHAPTER 4 DALIAN: SEA AND PLANNING PRACTICE IN THE CHANGING CONTEXT OF CHINA

4.1. INTRODUCTION

The Chinese government began to recognize certain environmental problems and address them as early as the 1950s (Palmer 2000). The measures were very limited, and restricted in terms of both environmental policy-making and institutional development. At this early stage, governmental concerns over the environment were contained in a few statutes concerning water pollution and industrial waste management and loss of arable land (Jahiel 2000, Palmer 2000, Shen *et al.* 2002). The modern era of environmental protection began in 1973 when the first national conference on the environment manifested an awareness of the environmental problems which had resulted from Mao Zhedong's utopian ideal of constructing a socialist state in the 1950s (Palmer 2000). A year later, environmental protection became institutionalized with the establishment of the environmental office under the authority of the State Council (Qu and Li 1984, Wang 1999, Lee 2005). Ever since its inception, "the history of environmental protection in China has been a continuous effort to build up institutions and vest them with the authority necessary to implement policy (Jahiel 2000:42)." At all levels – national, provincial, city, district, county and in some places, township – China has built up an extensive environmental protection apparatus which includes nation-wide environmental protection bureaus, monitoring networks and inter-agency coordinating bodies (Shen *et al.* 2002).

In 1979, the government enacted China's first environmental statute, the Environmental Protection Law (EPL). The EPL established fundamental concepts for environmental protection as well as the "polluter-pays" principle that has dominated in the environmental laws and decrees subsequently adopted in China (Ma and Ortolano 2000, Ferris and Zhang 2005). That year, therefore, saw the beginning of legal construction in the work of environmental protection (Shin 2002). Over the years, China has been developing one of the most dynamic environmental law frameworks in Asia and the developing countries. This framework consists of 20 national laws, over 40 state council regulations and approximately 500 ministerial standards for environmental control, resources management and consumer products. The list also includes about 1,000 environmental laws at the provincial and municipal levels (Shin 2002; Ferris and Zhang 2005). However, according to Palmer (2000:64), such efforts on legal construction may be a reflection of the government's commitment to environmental protection. The enforcement of environmental legislation, in Palmer's view, "has been somewhat erratic". The poor enforcement has related to problems such as ambiguity in legal provisions, limited access for the public, slow implementation, overlapping and competing bureaucracies, and lack of technical ability to enforce the law (Ferris and Zhang 2005). Perhaps at a deeper level, under the modern face of China's legal regime, lies the overwhelming influence of the ever-changing political and administrative system and the minor role of legislation and law (Palmer 2000; Ferris and Zhang 2000). The contemporary Chinese system of environmental protection can best be illustrated as a vertical system built upon a modern and sophisticated set of laws, hampered by extensive but underdeveloped environmental bureaucracies and poor policy and law enforcement,

and facing great challenges if it is to be sustained (Palmer 2000, Jahiel 2000, Ferris and Zhang 2005, Economy 2005). The system has some distinctive Chinese characteristics and strengths, such as fundamental legal support and bureaucratic networks. However, it is not often clear to what extent this system is able to address the emerging environmental concerns and the question of sustainability.

This chapter first discusses the Chinese government's commitment to the building of sustainable and livable Chinese cities. The government recently launched a national campaign of building "a socialist harmonious society". The aim is to move away from the policy of favoring economic development with reckless regard to the environment, and towards a growing view that development should deal with social inequality and less damage the environment. The uniquely Chinese notion of "a harmonious society" would, according to this view, play a predominant role in conceptualizing and implementing sustainability in a future China. The following section describes the conventional environmental assessment together with master-planning practice and its related problems in the city of Dalian. As one of the most advanced cities in China whose decision-makers have attempted to utilize SEA in its plan and program-making, Dalian offers a retrospective SEA case applied to its urban development master plan (2000-2020), reflecting a particular SEA form that is practical and suitable for Chinese environmental and planning regimes. The Chinese environmental bureaucracy plays a crucial role in the enforcement of environmental goals, and there are apparent problems of insufficient authority and a lack of coordination between institutional actors (Edmonds,

2000, Jahiel 2000). The last section explains the existing institutional arrangements in the Chinese bureaucracy.

4.2. SUSTAINABILITY IN THE CONTEXT OF A CHANGING CHINA

In China, the idea that political authority has fundamental responsibilities for maintaining harmonious relations between society and environment has been long-lived. From a historical perspective, the environmental protection regime before 1978 displayed clear links to both the Soviet model of a communist state and the Chinese tradition of an imperial management style. For instance, under Mao the environment was viewed as the enemy of human beings, something to be conquered (Edmonds 2000). The post-1978 reform period has seen strengthened commitment to environmental policy and management, which has led to a considerable transformation in environmental consciousness and governance. The evolution of China's environmental protection system and its experience with sustainability has been characterized by several recognizable phases, reflecting a trend towards growing environmental awareness and the government's more active engagement in international affairs (Box 4.1).

The Four Phases of China's Environmental and Sustainable Development

- **1973-1978** Embracing of environmental protection concepts and early initiatives
- **1979-1993** Development of EA legislation and pollution-abatement measures
- **1994-2001** Publication of China's Agenda 21 and experiments with sustainable development
- **2001-present** A new stage of building a harmonious society

Box 2 The Four Phases of China's Environmental and Sustainable Development

4.2.1. Background: Evolution of China's Environmental Policy

4.2.1.1. 1973—1978: Environmental Protection Concepts and Early Initiatives

Western academics and Chinese scholars have noted that since the 1970s China's growing political wish to engage more fully in international affairs has greatly inspired and stimulated the development of Chinese contemporary environmental management (Qu and Lee 1983, Cann, C., Cann,M., and Gao 2005; Economy 2005). The 1972 UN Stockholm Conference on the Human Environment was the initial driving force for the government to tackle the most acute environmental problems in some centres of heavy industry (Shin *et al*. 2005). The 1973 First National Conference on Environmental Protection was held to examine international experiences and the Chinese environmental situation. Subsequently, environmental management units were set up, and a top-down system of centralized control was adopted (Jahiel 2000). The focus in this period was to reduce the most visible forms of pollution such as heavy metals, the emissions from coal–fired plants, and soot. Pilot studies on environmental quality assessment were also carried out in some major cities such as Beijing, Shanghai and Nanjing. The period, therefore, was viewed as the preparatory phase for the establishment of a Chinese EIA system (Wang *et al.* 2003). Perhaps more importantly, the concept of environmental protection was asserted in the 1978 Constitution, which states, in Article 11, that 'the state protects the environment and the natural resources, and prevents and eliminates pollution and other hazards to the public'.

4.2.1.2. 1979–1993: Legal Establishment of EA legislation and Pollution-Abatement Measures

The post-1978 period was widely recognized as a new era of Chinese modern development because of its programme of reform, and has been termed the time of the 'opening-up' policy. This period was marked by the proliferation of crucial national environmental laws and a schedule of environmental regulation as environmental issues started making their way into policy-making. Since 1984 the government had required that economic development and environmental protection should be conducted simultaneously in national and regional planning (Gan 1998, Shin *et al*. 2005). Environmental policy in this period emphasized the overall consideration of the urban environment, the role of science and technology (S & T), and the concept of pollution prevention and clean production (Gan 1998, Wang Chen *et al*. 1999, Wang 2003). Notably, from 1989 on, the environmental agencies conducted quantitative assessments of the overall health of the urban environment in 46 major cities. Twenty-one indices were formulated to consider the quality of air, water, noise pollution, sewerage and urban "greenness" (Chen *et al*. 1999). These measures suggest that China at that time had begun to make use of a scientific approach in environmental management. The period has been recognized as giving rise to the main implementation phases of EIA. Proponents of more than 90% of all large- and medium-sized projects were reported to have conducted EIA between 1986 and 1990 (Mao and Hill 2002). At the local level, a system of permits for the emission of pollutants, and a time-limited system for pollution reduction forced heavy polluters to increase their environmental investment. The main environmental effort of the closing years of the 20th century was directed towards pollution control issues. Sustainability-related issues such as natural resource protection, or the tension between

economic development and the environment, often appeared as little more than lists of desirable changes and improvements. The inclination of government policy to emphasize pollution control evidently reflected the law-making and management measures at the time. For example, Article 19 of the national Environmental Protection Law (EPL) stipulates that measures "must" be taken to protect the ecological environment during the development and use of natural resources. With respect to those enterprises or institutions that cause severe environment pollution, the legislation and related regulations require the polluters to eliminate or control their pollution in a specific time period, or they could face heavy fines and be banned from operating.

Despite all the progress achieved in the period, the well-being of the environment had been traded for unprecedented economic development. After decades of Chinese isolation and in the pursuit of a planned economy, Deng Xiaoping, the core figure of the second generation of leadership, introduced market-style economic reforms with the goal of reducing poverty and improving the quality of life. Deng's policy and his determination to pursue economic development is condensed in his well-known "cat theory": It doesn't matter if it's a white cat or a black cat; as long as it catches mice, it is a good cat. The theory highlights Deng's pragmatic approach to measuring development. Therefore, the theory is a "modern version of pragmatic rationalism." (Ju 1999:44). Although economic growth has taken place at the expense of the natural environment and has resulted in serious pollution problems, the pragmatist view leading to unbridled GDP growth has dominated. Muldavin (2000) suggested that economic reform policies such as decollectivization and privatization have, in fact, intensified the environmental

degradation found in pre-Revolutionary and Maoist China. For example, a survey released by the World Bank (2006) indicated that 16 of the 20 most polluted cities in the world are in China. Contaminated water supply, poor sewerage and air pollution are major environmental problems resulting from the country's unprecedented economic growth (MacBean 2007). Aside from environmental degradation, social issues are also increasingly evident. The glowing picture of double-digit growth has frequently been eclipsed by issues such as the growing wealth gap between rich and poor, a widening disparity between rural and urban residents, and chronic unemployment.

4.2.1.3. 1994–2001 Publication of Agenda 21 and Experiment with Sustainable Development

Given the emerging call to reduce environmental degradation, the Chinese government published its 1994 action plan for facilitating sustainable development in Chinese society between 2000 and 2010: the China Agenda 21 – the White Paper on Population, Environment and Development of China in the 21st Century. This shift in both environmental ideas and enforcement was partly inspired by the international community, but was largely due to the pressure of the reality of severe environmental degradation resulting from the absolute priority that had been given to economic development since 1978. China was among the first developing countries to establish a national Agenda 21. The draft of the national Agenda 21 involved more than 300 experts from 52 organizations with inputs from various ministries (Gan 1999). Since then the development and implementation of Agenda 21 have involved multiple actions throughout different levels in society – national, regional, ministerial and, to some extent,

local. For instance, the Ministry of Forestry and Oceanic Administration formulated the Forestry Action Plan for China's Agenda 21 and Ocean Agenda 21, and the State Environmental Protection Administration (SEPA) released China's Agenda 21 for Environmental Protection (UN 2002). The formulation and implementation of China's Agenda 21 is considered of strategic importance in the country's progress towards sustainability. It has some unusual characteristics. First, although China accepted the consensus view of sustainability as development that meets the needs of the present without compromising the needs of future generations, the Agenda stressed China's special status and issues of population, poverty eradication, and economic development were given special consideration (SPC/SSTC 1994, Bradbury and Kirkby 1996, Gan 1998). Secondly, Agenda 21 addressed various problems associated with inefficient utilization of natural resources, indicating that inappropriate pricing, and confusion over rights of usage resulting from the planned economy, were major reasons. For this reason, Agenda 21 required the introduction of a market mechanism to control resource allocation, as well as reform of user rights and obligations (SPC/SSTC 1994; Bradbury and Kirkby 1996). Lastly, a mixture of instruments for environmental protection was proposed in Agenda 21, including the "polluter pays" principle, emission charges and financial incentives, and control and order procedures (SPC/SSTC 1994). Bradbury and Kirkby (1996) pointed out that the document may not itself secure sudden changes to the Chinese environment, but China's Agenda 21 symbolized the beginning of sustainable development deliberations and a growing environmental awareness. The proliferation of a series of ambitious environmental policies, plans and projects that followed Agenda 21 demonstrated China's commitment to developing the national economy in a sustainable

manner (Cann *et al.* 2005). One such instance is the move to reinforce sustainable development in the Tenth Five Year Plan 2001-2005 for National Economic and Social Development. Subsequently, environment protection has been an important component of economic and social development plans at all levels of ministries and agencies.

The progress and status of Chinese sustainable development were hard to determine at a period that focused on embracing new concepts and increasing public awareness. However, the annual report by The China Council for International Cooperation on Environment and Development (CCICED) indicated increasing evidence of more visible sustainability practices than before. CCICED is a critical sustainability research institution under the auspices of the State Council, the highest administrative authority, whose task is to review China's sustainable progress and provide advice to the State Council. Some examples include:

- The funding of and expenditure on environmental protection had increased steadily (for example, pollution control expenditure increased from 130 billion yuan (1991-1995) to 360 billion yuan (1995-2000), equivalent to 0.73% and 0.93% respectively (SEPA 2001)).

- A full array of market-based incentives to promote cleaner behavior throughout the industrial sectors was established (including fees, fines, permits, emissions trading and green taxes (Xu *et al.* 2006).

- A series of sustainable development programs was adopted by more enterprises (including cleaner production, the national eco-labeling program, the adoption of the International Standards Organization (1400 and 14001 series (Xu *et al.* 2006).

- 8,400 of the most polluted and energy-hungry industries were closed or replaced by higher-tech, or service, industries between 1995 and 2000 (SEPA 2001); and

- 44 national geological area and geological heritage reserves were established by the Ministry of Land to maintain biodiversity nationwide.

- A legal framework for protecting wildlife and administration was established (SEPA 2001).

4.2.1.4. 2002–present: A New Stage of Building a "Harmonious Society"

With a doubling of the Chinese economy projected for this decade, the severity and range of social, administrative and infrastructural problems are at their most acute in China (Kuhn 2005). Agenda 21 emphasized the distinctiveness of the Chinese development style, and claimed that models based on experience elsewhere have little relevance in the Chinese context (SPC/SSTC1994). Development of a healthy and sustainable society is inextricably linked with local development needs and cultural considerations. The problem has provoked an ideological shift among the Chinese leadership with regard to how to build a sustainable Chinese society. The challenge that faces the new (fifth) generation of leadership is to seek integrated sets of solutions to all the consequences of unceasing economic development. The period is therefore characterized by the acceptance of a set of new ideas and values of sustainability from international communities and a series of concepts that contain Chinese cultural identification and political implications. The consideration of ***environmental governance*** was an example. China's notion of governance was borrowed from the definition of the Institute of Governance, Ottawa, Canada:

> Governance comprises the traditions, institutions and processes that determine how power is exercised, how citizens are given a voice, and how decisions are made on issues of public concern (CCICED, 2002)

Although the concept is new, it is recognized that increasing transparency in environmental governance is a key condition for progress toward sustainability, and the usefulness of SEA in development planning was recommended by CCECED as a

measure to enforce good governance. The concept of a ***circular economy*** was adopted nation-wide in 2003 to encourage sustainable production and consumption. It was recognized that boosting economic growth through material consumption and at the cost of the well-being of the ecosystem and human health was a major policy dilemma (CCICED 2006). The principles of the circular economy imply major increases in the efficiency of materials use, which is bound to lead to the reduction in use of materials and pollution in absolute terms. To encourage recycling, the government issued a new ministerial regulation,[4] which provides for a tax refund when a product is made from recycled materials or by comprehensive utilization of resources. Half of the value-added tax was refunded if energy used was a result of "gangue, peat, shale, oil and wind" (Cann *et al.* 2005:20).

A series of Chinese-style sustainable notions and concepts, derived from traditional Chinese culture and wisdom, was also advocated and incorporated into the Chinese goal of moving towards a sustainable society. For instance, China's goal of a ***Xiaokang society*** connotes a "well-rounded, well-off" society in which economic advancement is a prerequisite, but harmony between development, social equality and the environment is the focus (CCICED 2003). The ideology is a classical Chinese cultural concept which may be traced back 2,000 years, implying an ideal society of affluence. The concept was at the core of Deng's pragmatic approach to development and was criticized as being used to advocate unbridled economic growth in the 1990s. However,

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[4] The new regulation is a Notice on Policy Issues concerning Value-added Tax for the Comprehensive Utilization of Certain Resources and Other Products, issued by the State Economic Trade Commission and the Ministry of Finance (CCICED, 2002).

the concept was revived by the new-generation leadership to denote both the material comfort and the harmonious development of all aspects of a society (UNDP, China 2005). The ideology of building a *Xiaokang* society was an excellent example of the use of an ancient Chinese cultural concept to denote Chinese contemporary development strategy. Of two critical political philosophies held by President Hu, the ***scientific concept of development*** or ***scientific development perspective*** (*ke xue fa zhan guan)* stresses that development should value not only quantity and speed but also high quality and energy-saving. The thrust of the concept is based on the necessity of integrating a complex agenda of political and social considerations into the paramount task of economic growth. It aims at rectifying economic imbalance and institutionalizing sustainable development (Kuhn, 2005). From the scientific development perspective emerges a critical philosophy that summarizes a systematic approach to development and growth, i.e. **a harmonious society** (*he xie she hui*), or China's model of democracy as interpreted by Kuhn (2005). A harmonious society is described thus by President Hu (Xinhua, 2002):

> Such a society, in essence, is one that respects the rights of people, sticks to the principles of human civilization and abides by the laws of nature.

Kuhn (China Daily, 2005), a well-known expert in Chinese policy, summarized the developmental approach of China's model by stating that it

> …combines economic growth, a free market energized by a vigorous "non-public" sector, concern for the welfare of all citizens, cultural enrichment and a synergistic approach to rectify economic imbalance – all of which lead, in Hu's vision, to a Harmonious Society.

In Kuhn's view, China is attempting to promote a socialist model as an alternative to Western democracy, particularly for developing countries. Though it is too early to say in what way and to what extent the concept of a harmonious society will reconstruct a new society in China, it will certainly set the keynote for social and economic development in

next two decades, and affect China's practice on sustainability. A discussion on this concept will be presented in section 4.3.2.

To sum up, the factors that determine the contemporary Chinese environmental protection regime and practice of sustainability are multi-faceted. The main facets are condensed in Table 4.1 and a discussion follows.

Period	Attitude on the environment	Dominant influential International Ideologies and theories	Characteristic of Environmental Protection	Environmental Goals	Environmental Management Instruments
Before 1973	Environment as adversary to be conquered	Maxims; Marxist economic theory; Effects of environment on health	Growth-oriented, no clearly defined environmental policies	Industrialization; Reducing health risks	Mass mobilization efforts; Moral persuasion
1973-1978	Environment as one part of economic development	UN conference on the Human Environment; Coordinated development	End-of-pipe solution; Environmental control	Point check and control of key pollutants	Command-control management; Emissions levies
1979-1993	Economic development and environmental protection are mutually exclusive	Environmental damage of development; The Brundtland Report	Pollution prevention; Overall treatment	Total emissions control; Overall treatment and clean-up of urban environment	Polluter-pays principle (1979); Emissions charges and utilization of EIA tools
1994-2001	Sustainable utilization of natural resources	UNCED Agenda 21	Internalizing environmental costs; Administration management	A system of laws, regulations and standards; Sustainable development	Ecological planning; Urban planning; Waste management
2002-	Scientific concept of development; Human beings and the environment in harmony with each other	Chinese cultural traditions; Western Utopian theories and maxims	Balanced development between society, economy and environment	Building a sustainable harmonious society	Enforcing legal system; SEA; Sustainability indicators

Table 4.1 Evolution of Contemporary Chinese Environmental Management System
(Sources: adapted from Gan 1998; Edmonds 2000; Jahiel 2000; Kuhn 2005; MacBean 2007; Seymour 2005).

4.2.2. Factors that Inhibit Progress towards Sustainability

Cultural changes, institutional changes and attitudes toward the environment are the three most recognizable factors that have influenced China's environmental protection and its efforts in the field of sustainability. China's rich cultural heritage of preserving nature has largely remained in the ideological sphere of the past and has not been used in development practice. Some researchers, such as Economy (2005), have suggested that China has no strong culture of conservation, indicating that traditional Chinese wisdom and thought often asserted man's interests and needs over the well-being of nature. In contrast, Smil (2004) along with other researchers (for example, Weller and Bol 1998) have maintained that the Chinese cultural legacy on environmental attitudes and nature conservation has been predominantly positive, with some examples of what we would now call good practice dating back well over 2,000 years. Sometimes, traditional culture played a constructive role in inspiring ecological activism at the local level. For instance, Daoism, which originated in the third century BC, teaches the principle of man's accommodation to the natural environment, and advocates that no changes should be made to nature as it was already in existence and properly arranged (Weller and Bol 1998). In the words of the book *Dao De Jing*, the idea of *weiwuwei, zewubuzhi* suggested that the best way for the Wise Man to govern his land and his people is by choosing not to spoil any part of nature (Smil 2004). Neo-Confucianism also advances the notion of the "human-in-nature" (*tian ren he y*i), which emphasizes that humans should be integrated into nature. Ironically, these views have remained in the ideological domain and Chinese environmental practice has followed a partially independent course, where human utility has been given first consideration (Weller and

Bol 1998). Smil (2004, p.142) noted that "powerful transformation and subjugation co-existed with feelings of awe and admiration of nature, and with the advocacy of nature's supremacy". It was until quite recently that the Chinese leadership used these ideas from the traditional Chinese culture to legitimize their vision of development. Building a *Xiaokang* society and a "Harmonious Society" are two such applications.

China's environmental situation is the result of policy choices and institutional changes that took place over decades. Political transformation has had a profound effect in shaping the environmental bureaucracy. The control and order model and the associated top-down management system have dominated China's environmental and planning bureaucracies for more than half a century. In fact, they have some merits. The approach can produce rapid implementation of programs associated with a specific environmental problem, and is capable of changing or enforcing environmental and management-related legislation (McElory *et al.* 1998; McCleave *et al.* 2003). The authoritarian system also facilitated the rapid development of a Chinese environmental legal system, including national laws, regulations and standards for environmental protection. However, the new actors who have emerged from China's economic and political reforms have to a great extent diminished the leading role of the central government in a top-down system. First, decentralization has occurred right across the nation since the introduction of the reform and opening up policy in 1978.The local governments have obtained considerable discretion in planning and decision-making (Qu 1990). Decentralization of administration has meant that not only considerable political authority, but also substantial social responsibilities, have been devolved from the centre

to local officials. Jahiel (2000) noted that the increased independence of local governments to address most environmental problems has been a fundamental structural obstacle to implementation of environmental policy. Seabrooke *et al.* (2004) have also suggested that the main obstacles to accommodating sustainable development principles lie not within the national government, but largely in local leaders who often ignore central policy and pursue purely economic and local interests. This new-found reliance on local government's ability to address environmental problems has produced a patchwork of environmental protection policies among regions and cities (Jahiel 2000; Ma and Ortolano 2000; Economy 2005). Some cities and regions have moved aggressively to respond to environmental challenges, while others have been slower and reluctant to implement environment-friendly policies. Economic openness, initiatives by local leadership and institutional capacity are the key factors that create wide regional variation in environmental performance (Shin 2004). Therefore, decentralization is a double-edged sword.

Secondly, compared to fundamental economic reform, the political and institutional reform was not only belated but superficial. The broad political framework for policy-making in China is still highly centralized, and importantly, no clear distinction is made between law and policy (Hill and Mao 1998). China's environmental policy can either be supported by a formal legal framework or be launched by the government, or even senior officials (Chen 1992). Thus, leadership and political authority may override legal authority (Sinkule and Ortolano 1995; Hills and Man 1998; Mao and Hills 2002; Skinner *et al.* 2003). Consequently, although the legal basis of its society has

been greatly strengthened in recent years, contemporary China is, to an extent, still ruled by individuals rather than laws (Parlmer 2000). Another distinguishing feature of the Chinese administrative system is the role of personal and organizational relationships (*Guanxi*), which are part of crucial culture context of China's policy-making (Figure 4.2). *Guanxi* exercise powerful mediating influences on the process of policy implementation (Hill and Man 1998, Figure 4.1; Sims 1999). The enforcement system has thus been very inefficient and given rise to problems of corruption (MacBean 2007).

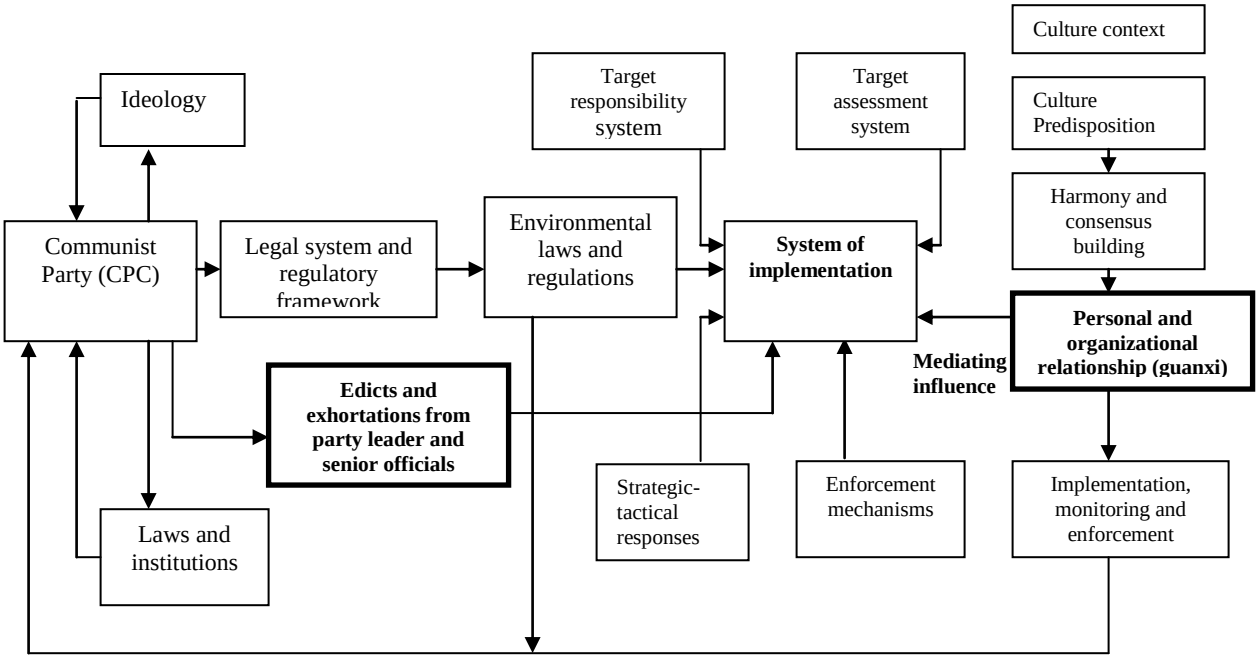

Figure 4.1 Model of Environmental Policy-making and Implementation in China
Source: Hills and Man (1998)

Finally, a persistently conservative ideology towards environmental protection has overshadowed the Chinese acceptance and practice of sustainable development (Palmer 2000). The post-1978 reform period revealed the dramatic tension between economic development and the environment. Continued economic development for more than two decades has transformed China into a flourishing economy while China's environment has borne much of the cost of this unprecedented growth and reached

alarming levels of degradation in both rural and urban areas. According to many researchers, the fundamental reason behind development problems, including pollution, is market failure, *i.e.* the Chinese market system cannot properly account for the cost of environmental and natural resource damages incurred in the development process (STC/STTC1994, Bradbury and Kirby 1996, Breslin 1996, Xu *et al*. 2006, MacBean 2007). Meanwhile, economic growth has facilitated technological advancement and improved the State's capacity to address environmental problems. Xu *et al*. (2006) noted that recognizable improvements had been made to China's ecological performance because of the integration of environmental considerations and economic development. Although among most Chinese bureaucracies the acceptance of the view that development and environment are not mutually exclusive was common, a conservative attitude towards the environment has nevertheless been persistent (Edmond 2000; Palmer 2000). One concept that has best reflected this materialistic view is "coordinated development" proposed in 1980s, where environmental protection is viewed simply as a component of the national economy. The concept is well encapsulated by Palmer (2000, p.67) in his article entitled "Environmental Regulation in the People's Republic of China":

> The notion of 'coordinated development' means that environmental protection is regarded as one sector or dimension of the economy, and is therefore in essence an *economic* issue, rather than a social issue. This in turn encourages a *short-term view* of environmental degradation, with administrators concentrating on some sort of immediate cost balance between the needs of economic growth and environmental protection. It also encouraged the view in China that the PRC must avoid 'negative protection of the environment' at the expense of development needs – in other words, development was, in reality, given priority over the environment.

Beyond these discussions lies the fundamental question of the future of China's environmental protection and its orientation towards sustainable development. How well can the Chinese leadership apply cultural and indigenous significance to the concept of sustainability? What incentives can be offered to promote sustainability practices at local level? And what political and institutional transformations are needed to empower the environmental protection apparatus sufficiently to meet sustainable challenges in building a harmonious society? To answer these questions, we need, like all researchers in this field, to ask ourselves a central question: namely, what is the Chinese interpretation of sustainable development?

4.3. UNDERSTANDING CHINESE SUSTAINABILITY

4.3.1. China's Concept of Sustainable Development

China's interpretation of the concept is not totally different from the mainstream understanding of sustainable development in developing countries in the wider international arena. Perhaps most notably, though, central to understanding China's sustainability and environment is the recognition that economic development is the prerequisite for sustainable development and has to come first (SPC/STTC 1994, Amsden *et al*. 1996).

4.3.1.1. Attitudes towards Economic Development

China's Agenda 21 gives declared priority to economic development, emphasizing that economic development is the central task of the nation as well as the precondition for achieving sustainable management of natural resources together with

environmental protection (SPC/STTC 1994, Ng 2004). Some researchers have indicated that if the Chinese economy did not grow, environmental degradation would certainly continue given China's onerous duty of accommodating its huge population (Amsden *et al.* 1996). Others, on the contrary, have suggested that China may not necessarily choose to ignore current environmental degradation in its quest to achieve future economic development (Niu and Harris 1996). In fact, for most of the Chinese bureaucracy, the goals of economic growth and environmental protection are not mutually exclusive – economic growth will eventually help to pay for the environmental clean-up (Edmonds, 2000). The growth-centered policy defends itself by suggesting that fast growth in output is typically associated with environmental decay, as occurred in the industrial period of most Western countries. If the Chinese growth rate persists in the future, China may dedicate resources to an environmental clean-up in the end (Amsden *et al.* 1996). This view reflects the conventional industrial model, "rapid growth now, clean up later"(CCICED, 2002). Harris and Udagawa (2004) noted that this view has predominated in most developing countries, where the pursuit of sustainable development has been seen as a means to economic growth and financial aid from central authorities or international institutions. Bradbury and Kirkby (1996, p.98) hinted that China's speedy publication of Agenda 21 in 1994 was partly aimed at strengthening "China's case for international loans and other forms of support to compensate for shortfalls in national financial provision during the forthcoming Five Year Plan (1996-2000) and beyond".

4.3.1.2. Pollution Control and Capacity-Building

China's contemporary commitment to sustainability is notable for the substantial

importance attached to physical environmental problems. The goal of China's sustainability is thus not all-inclusive because it focuses only on natural resources such as air, fresh water, oceans and forests, and on the aim of protecting them from environmental pollution and ecological damage (Wang *et al.* 2003). As a result, the natural observable impacts of water supply, sewage and air pollution have become major concerns for most Chinese cities, while behavior and the social and cultural factors related to damage to the natural environment and to sustainability considerations are still deemed relatively unimportant.

Furthermore, policies and practice are severely biased in favor of technological solutions and hard services rather than environmental management capacity-building. The effect of pollutants which are visible and have abatement benefits have received the greatest expenditure at all levels by the environmental authorities. This biased policy is manifested in the National 10th Five-year Plan for Environmental Protection (SEPA, 2000). During 2001 to 2005, investment in environmental protection was budgeted at 700 billion Yuan, accounting for 1.3% of GDP and about 3.6% of total fixed investment, respectively, and was acclaimed as a remarkable improvement (Xu *et al*. 2006). But, of the entire budget, 40% is allocated to air pollution control, about 39% goes on water pollution, and only 1.4% on environmental education and training (Table 4.2)

Investment Projects	**Hundred million Yuan**	**Percentage (%)**
Air pollution prevention	2,800	40
Water pollution prevention	2,700	38.5

Solid waste management	900	12.9
Ecological conservation	500	7.2
Capacity building	100	1.4
Total	7,000	100

Table 4.2 Distribution of Environmental Protection Investment in 2001-2005
Source: SEPA (2000): the national tenth five-year plan for environmental protection

4.3.1.3. Public Participation

The Rio Declaration (1992) stresses that environmental issues are best handled with the participation of all concerned citizens at all levels. Bringing the public into environmental problems does not only give meaning to democracy and confer legitimacy upon planning and implementation, but also takes advantage of local knowledge (Fisher 2000). In China, reservations concerning the fostering or permitting of public participation in development and environmental decisions made by the government overshadow meaningful progress towards sustainability. China has over two thousand years of imperial history, and the idea that the political authority bears fundamental responsibility for environmental issues has prevailed for centuries. The concept of public participation, with a focus on the empowerment of local people in development and planning, lacks a solid historical and cultural background. Observations made by some researchers, both domestic and foreign, strongly suggest that public opinion on the environment has not been a major force shaping environmental policies (Cooper 2006). It is the public's own environmental perceptions of the environment that are being shaped by state policies propagated by the media. Although awareness of the environment is on the rise in China, basic understanding by the public of the nature of many issues has remained limited. Lee (2005) provided some empirical evidence of environmental

attitudes and consciousness within Chinese society, and the data suggested that environmental concerns rank relatively low among members of the public compared to other economic and social concerns. Lee (2005, p.56) also noted that most Chinese citizens consider showing support for environmental protection to be a "politically correct posture", although the actual degree of support is much lower when confronting a trade-off (Table 4.3)

Development Goal	Rank
Economic Development	1
Scientific Research	2
Population Control	3
Social Justice	4
Environmental Protection	5

Table 4.3 Public's Rank-Ordered List of National Development Goals
Source: Lee (2005)

Although the research demonstrated that in most contexts, public support would cause increased government attention to environmental protection in China (Lo and Fryxell 2003), when it comes to making decisions it is the concerns of the government officials entrusted with authority, not public concerns, that matter (Lee 2005). The Chinese model of socialist democracy requires increasing openness and transparency within the Party. Kuhn (2005) termed this type of democracy a "democracy of the elite". When the critical decision-making process will be accountable to the public remains an open question. Not only is the political climate not responsive to public pressures, but the government officials simply do not have a high regard for public involvement in environmental issues (Lee 2005). Presently, there are over 2,000 officially registered environmental NGOs (SEPA 2000), but their influence is rather limited. Letters, visits and phone calls are the most common means for the public to make complaints on

environmental issues (Ma and Ortolano 2000). Cooper (2006) suggested that along with other civil society actors, environmental NGOs are at the development stage of seeking legal support and defending the space allotted to them by the government. However, Cooper (2006) has optimistically suggested that China's environmentally active civil society may obtain more authority to expand its interests because social and environmental reform is now under way in China.

4.3.1.4. Technocrats, the New Actors

At present, the bureaucrats and the technocrats are two critical groups which influence China's practice on sustainability. The entry of scientists and engineers into the policy-making process has resulted in a new framework which, to some degree, allows policy innovations to take place (Gan, 1998). The reform of the Chinese political system has lagged behind economic reform, but there are still a number of promising signs. The breakthroughs were first made in the administrative and management systems. A process of professionalization has been undertaken at all levels within government agencies since the 1990s, and a large group of scientists or professionals was recruited to the government. The emergence of this level of leadership has helped to strengthen the so-called technocratic culture within the political system (Gan 1998). For instance, compared to the old generation of leadership, all nine members of the Standing Committee of the Party in the new leadership have academic training: President Hu, for example, has training as a civil engineer specializing in hydrology and Premier Wen Jiabao is qualified in geology. In the case of the municipality of Dalian, the current Mayor holds a doctoral degree in Finance and Economics. These new-style bureaucrats

have brought changes to the government agenda and policies, which can now be seen from a different perspective. They are described as mediators for policy change in the political system, and linkages between decision-making and science have been established (Gan 1998). This change has provided a basis for the diffusion of sustainable development concerns in the government policy system. However, most of these professionals are in middle-level positions, affiliated to bureaucrats who have an extensive political background, and their influence on policy-making is constrained to a large extent by the top-down bureaucratic structure. The role of scientists or technocrats in promoting sustainable development is channeled through scientific advice, conferences and workshops, management consultation, training for policy-makers and informal networks of contacts in the government (Gan 1998). The four themes illustrated above provide a foundation for understanding sustainable development under the distinctive Chinese political, social and cultural circumstances. More recently, a new and distinct concept of a Chinese society characterized by the idea of well-being has required particular attention and in-depth exploration, which may hold promise for creating a Chinese way of sustainable development in the near future.

4.3.2. The Concept of "a Harmonious Society": Historical Roots and Contemporary Practice

Building a harmonious society is the thrust of the new political philosophy of the Chinese leadership. It moves away from a policy of favoring economic development at all costs and towards a more balanced view of growth that considers both social inequality and environmental damage. Many researchers, such as Kuhn (2005), have

pointed out that this ideological shift has a more significant and far-reaching influence on contemporary Chinese society than the well-known open reform policy which has brought dramatic changes to social and economic aspects in the past quarter of a century. Rooted deeply in the Chinese cultural heritage, the concept has been said to be a vital theoretical innovation essential to building a society with Chinese characteristics. Researchers like Lau (2006) have even claimed that, as China's Harmony Socialism is gradually winning international recognition, it will provide an alternative model to American-style democracy as the leading 21st century governance system. What a harmonious society conveys and in what way it influences the course sustainability in China are questions that are open for discussion.

4.3.2.1. Historical Origins

China has practiced harmony as a way of life since the times of Lao Tze and Confucius – that is, for at least 2,500 years. In contrast, American democracy is only 230 years old, borrowing from the traditions of the European Enlightenment and introduced into Chinese society in the early 1900s. Undoubtedly, the concept of harmony is likely to have the greater recognition among Chinese society. As Lau (2006) has put it:

> There is a very strong philosophical undertone that is deeply rooted in our culture. If the overriding consideration of building a harmonious society is to persist for a prolonged period of time, it will gradually permeate into every facet of life and become a core value among all citizens, like reform and opening up.

Harmony, as taught by the Chinese ancients, was a way of resolving conflict between the ruler and the ruled in the imperial period of China (Fung, 2006). Early Chinese philosophers articulated a broad systematic context in which cosmic resonance operated

under the forces of ***Yin*** and ***Yang*** (Weller and Bo 1998). *Yin* and *Yang* are two opposing but also complementary forces in nature. They are white and black, light and dark. According to the doctrine of the Dao, either *Yin* or *Yang* will predominate over the other, giving rise to conflict. Within the universe, all things, people, and events are interconnected by a web of resonant affinities (Fung 2006). Every action has consequences surpassing its visible, linear effects in the here and now. It is suggested that, following the rules of resonant affinity between objects, the ruler may bring about harmony within his kingdom by balancing the two opposing forces (Weller and Bo 1998). The theory of *Yin—Yang* declined in the seventeenth century, but it is believed that it never ceased to be persuasive and compelling to Chinese intellectuals and its associated practices continue to be important with the public. A harmonious society seeks a point of balance between all the factors and conflicts encountered within it. ***Neo-Confucianism***, though not exclusively concerned with the ecological state of the environment, further interprets the harmony concept from a social and political perspective. It considers humans as social and political actors and stresses the importance of a model of an integrated, dynamic system of social life for individuals (Weller and Bo, 1998). A social system in Confucius's teaching is primarily about man within himself, man among men, man and society, and relations between groups and countries (Fung 2006). Harmony between government and its citizens is achieved through self-discipline, high moral values and social order, rather than strict laws and a rigid penal system (Kuhn 2005; Fung 2006).

4.3.2.2. Links to Sustainability

Some scholars have suggested that the concept of a harmonious society is more all-encompassing that that of sustainable development (for example, Lau, 2006). The latter involves trade-offs between economic, social and environmental factors for the purpose of maintaining the well-being of both humans and nature, while a harmonious society seeks appropriate and properly balanced relationships between all factors, and environmental concerns are part of the whole system. However, the discussion presented in the previous sections suggests that the concept of a Harmonious Society is more a political philosophy of the Chinese leadership than an environment-related concept. In a Chinese context, sustainability is primarily concerned **with the ecological aspects of the environment**. China's sustainability stresses the relationship between humanity and nature through properly protecting natural resources, reducing pollution and improving the quality of the environment. The notion of a Harmonious Society, instead, focuses on **social and political reform.** From a theoretical perspective, a distinction can be drawn between the concept of harmony and that of sustainability, the former emphasizing the balancing of conflicting elements and the latter seeking the integration of these elements to provide mutual gains. However, the relationship between the two concepts should be one of complementary functioning, not a choice between opposites. Interestingly, a harmonious society emphasizes a set of principles that is similar to that of sustainability, though the implications vary in the Chinese context (Xinhua 2005):

- Sustained and coordinated economic growth: The essence of a harmonious society is affluence. This involves narrowing the gap between rich and poor, eliminating poverty and increasing social wealth.

- Socialist democracy: The democratic policy-making mechanism helps to balance different social interests and avoid social conflicts through including the people's opinions and absorbing their intelligence.
- Rule of law: There is a need for gradual improvement of the legal system, standardized social management, ordered market competition, strict market management and standard market behavior.
- Social equity and justice: It is important to balance different interests and strive to ensure equality for all in terms of personal rights, opportunities, game-playing rules and wealth distribution.
- Ideological and ethical development: A harmonious society should also see great improvements in morals and education. Without common ideological aspirations or high moral standards, a harmonious society will be a mansion built on sand.

In sum, the discussion suggests that the quest for sustainability in China has been one that balances geographical, demographical and historical constraints, as well as the tension between economics and Chinese environmental values (Shapiro 2005). In implementing the strategy of sustainable development, the emphasis for China is to create a new mode of development to replace the traditional ones that have been proven unsustainable. Two major changes have influenced China's sustainability practice – one being the economic system, which has transformed the country from a planned economy to a socialist market economy; the other being gradual social and political reform to build a socialist democracy. The following section presents an environmental assessment and a look at planning practice at both national and local levels.

4.4. SEA AND PLANNING PRACTICE IN CHINA AND DALIAN

4.4.1. Background: Opportunities and Constraints

Environmental Impact Assessment (EIA) was formally introduced in China as a strategy for environmental protection through the trial implementation of the

Environmental Protection Law (EPL) of 1979. The first EIA was conducted on a copper mining project in Sichuan, a south-western province of China, between 1979 and 1981 (Wang *et al.* 2002). Subsequently, the application of EIA grew rapidly. The rate of compliance had reached 90% for medium and large construction projects in the 1990s (Mao and Hill 2002). At this point, China had established a complete assessment system of EIA institutional and procedural frameworks. The Environmental Protection Law (EPL) of 1989 and 15 specific complementary laws on water, noise and air pollution control, management of solid waste, resources conservation, wildlife, land use control, and disposal of hazardous material provided the legislative basis for EIA implementation. Meanwhile, the institutional restructuring at both state and local government level in 1998 elevated the status and power of environmental protection authorities, strengthening their authority to conduct EIA at central and local levels. More recently, three aspects of development have been particularly noteworthy. First, the new 2003 EIA law not only dramatically strengthens the legal status of EIA in China, but also improves the effectiveness of the EIA system and decision-making process by subjecting EIA practice to judicial review in certain circumstances (Che *et al*. 2002). Second, a requirement for cleaner production in the context of EIA implies a departure from the old end-of-pipe model to a more preventative practice (Chen *et al.* 1999). Last but not least, Strategic Environmental Assessment (SEA) was introduced in the 2003 EIA law for use with various types of plans and programs at various governmental levels. The inclusion of SEA requirements complemented the project-oriented EIA process and marked "a real step forward for EIA in China" (Wang *et al.* 2003, Appendix 2, Box 2).

However, the application of EIA in China has its problems (Chen *et al.* 1999; Mao and Hills 2002; Zhang *et al.* 2002; Wang *et al.* 2003; Lo *et al.* 2003). The problems can be reduced to four causes: the limitations of EIA regulations and policies, political intervention by local governments, massive resistance, and inefficient implementation mechanisms (Table 4.4).

- Narrow focus of the EIA regulations and policies (mainly on the environmental impacts of pollutants from development projects)
- Lack of any requirement for prevention of pollution and monitoring in the EIA procedures
- Being used as a tool of end-of-pipe treatment control rather than one for pollution prevention
- Occurring too late to influence project decisions
- A failure to consider the issues of alternative sites, technologies, and process design
- Lack of standardized methods in the EIA guidelines
- Poor EIA quality and low implementation of mitigation measures
- A dual leadership governing environmental protection agencies (administratively, they are independent agencies and report to higher-level agencies, while financially they are funded by local government)
- Massive resistance to the EIA requirements from small industrial projects, particularly township enterprises
- Insufficient financial resources, and shortage of staff in local environmental agencies
- Lack of transparency and public participation in the EIA process; and
- Political and bureaucratic intervention by local governments that are driven by the exigencies of economic development.

Table 4.4 The Problems of EIA in China
Source: Chen *et al*. (1999); Mao and Hills (2002); Zhang *et al.* (2002); Wang *et al. (*2003); Lo *et al.* (2003)

First, the EIA regulations and guidelines are not devised in a way that considers a number of serious environmental concerns: small industries that have generated the most

serious pollution problems have frequently avoided an effective EIA process (Chen *et al.* 1999, Zhang *et al*. 2002, Wang *et al*. 2003) and also, the provision of end-of-pipe treatments for pollution has been a common practice (Chen *et al.* 1999). For example, a polluting industrial project can be approved as long as it has pollution treatment facilities and meets national discharge standards; and provisions concerning the cumulative impacts of the project and consideration of alternatives are missing in EIA requirements (Wang *et al*. 2003). Second, the dual leadership system used in EIA management facilitates intervention from local governments which give priority to local economic prosperity, instead of to environmental issues (Mao and Hill 2002, Wang *et al*. 2003). Administratively, local environmental protection bureaus (EPBs) are subject to the jurisdiction of both higher environmental authorities and local municipal governments. Financially, funding of local EPBs relies exclusively on support from local government (for instance, see the case of Dalian, Figure 4.2). Therefore, there are cases in which local governments force through approval for projects that have immense economic importance even though an EIA report might describe severe related pollution problems (Mao and Hill 2002).

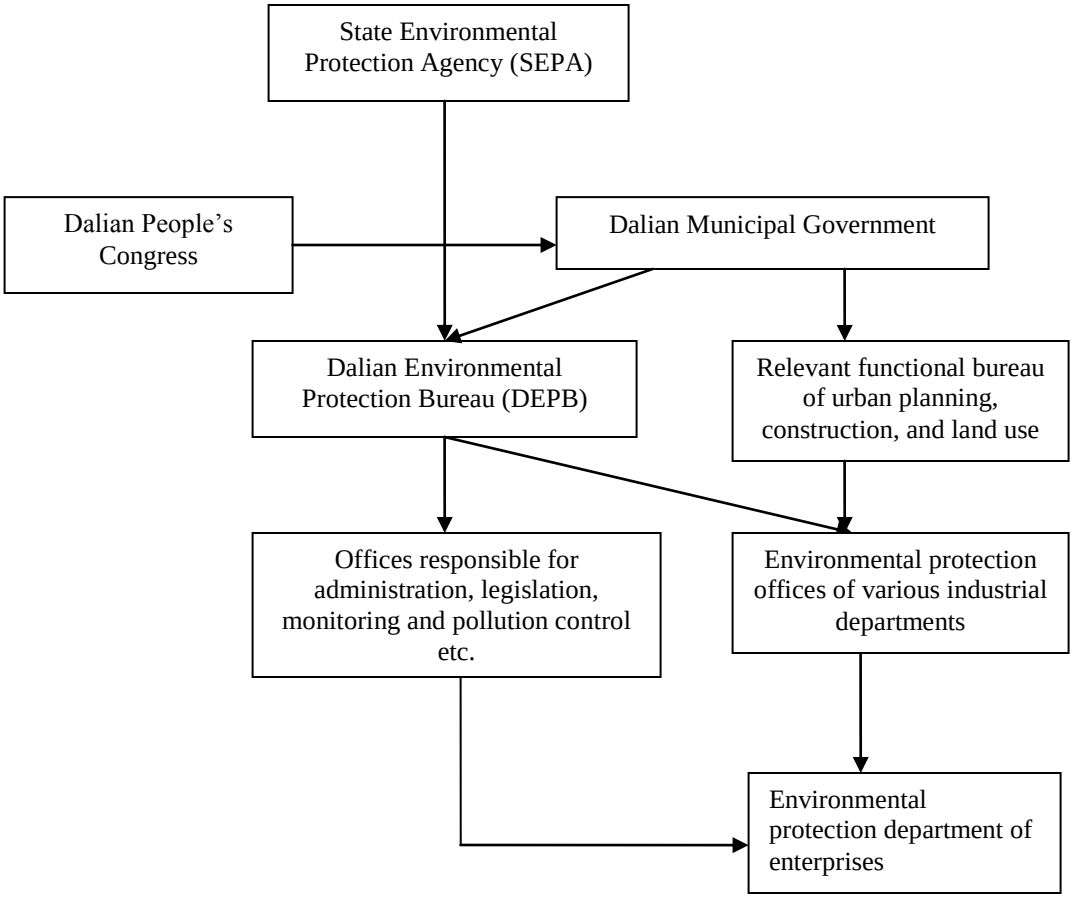

Figure 4.2 Institutional Structure of Dalian's Environmental Management System

Third, a degree of resistance exists from both government officials and industries with regard to the adoption of stricter EIA requirements and implementation (Mao and Hill 2002; Lo *et al*. 2003). Although most local bureaucracies have attempted to reduce environmental damage and pollution problems, environmental issues are still not critical factors in decision-making. One reason relates to the relatively weak authority of environmental protection agents (Jahiel 2000). More importantly, the pro-growth view, still prevailing in the government, has tended to trade off environmental welfare for other development goals (Palmer 2000). Lastly, as with other developing countries, a limited institutional capacity has been a persistent barrier to effective EIA implementations. This

includes insufficient political will, lack of practical guidance, a compartmentalized structure, in addition to an absence of accountability and shortages of funding and staff (Wang *et al*. 2003).

Of the many urgent issues to be addressed for improvement in EIA practice, Wang *et al.* (2003) believe that one priority is the development of new models of EIA, which can shift the current pollution-control procedures to more comprehensive pollution prevention processes where social and ecological impacts as well as indirect and cumulative impacts can be considered within broad policy and development frameworks. The provisions for SEA of plans and programs in new EIA law, in their view, hold some solid hope for the enhanced utility of EIA in China. Limited, tentative application of SEA to regional energy strategy, sectoral development policy, regional economic development planning and environmental legislation formulation has commenced across the country (Che *et al*. 2002). The regional environmental impact assessment (REIA) process, a variation of SEA, was introduced in 1993 to cope with the problems of identifying investment priorities and guiding the choice and design of projects in the planning of the development zones. Mao and Hills (2002) argue that this type of SEA has become a source of resistance to the EIA requirements rather than a way of improving EIA applications, because in many cases the EIA requirements, already minimal, are made even easier by leaders in the development zones, who have been driven by competition for foreign investment. Nevertheless, China's application of SEA is still at a very early stage, and limited in both scope and form (Che *et al*. 2002; Bao *et al.* 2003): there has been no compulsory guidance, the systems to put SEA into operation have not yet been established nationally, and the procedural and methodological issues remain to be solved.

Dalal-Clayton and Sadler (2004) have suggested that the potential need and demand for SEA training in China are huge: about 100,000 trained practitioners will be required for the new law to become fully operational.

The application of EIA in planning processes has also proved to be problematic. Two distinctly separate planning systems have existed in China's planning practice since the 1950s. Urban planning is exclusively limited to physical development such as land use planning and transportation planning, while social and economic development planning is the responsibility of planning officials at the Reform and Development Commission under the auspices of the provincial or municipal government (Yeh and Wu 1999; Zhang 2002). As a matter of fact, urban planning in China has not historically been credited with the appropriate degree of importance and significance. The practice of specialized urban planning began in the 1950s when China committed to post-war construction. As with most socialist countries at that time, China copied the Soviet master planning approach to city development, derived from the desire to employ scientific rationality to create urban space, which strongly stressed the functional specialization of urban space (Yeh and Wu 1999). After a period of rapid urban growth in the 1950s, the 1960s and 1970s witnessed a departure from the Soviet mode to the so-called Maoist approach to urban planning, which aimed to eliminate the urban class structure, and to overcome disparity between city and countryside. The cities in this period were viewed as self-reliant, concentrated sites for industry instead of representing centers of regional economic development. This prevalent attitude toward urban development led to the dismantling of urban planning as a profession during the Cultural Revolution in the 1960s

and 1970s (Leaf 1998; Yeh and Wu 1999). Kirkby (1985) argues that the idea of anti-urbanism was driven by a narrow vision of the role of the city. Throughout the period from 1949 until 1978, socialist China, portrayed as a "police state" in the Foucaldian concept of governmentality by Ng and Tang (1996), adopted a top-down and purely centralized system of urban planning. The system is based on the assumption that a strong and centralized state should have complete and total administration of the economy and society. Planning was a conceptually de-politicized process of spatial and resource allocation (Leaf 1998).

Economic reforms and administrative decentralization since 1978 have fundamentally changed both the practice and the development of urban planning. Complete state control over urban investment and decision-making has increasingly abated while local authorities have gained an enormous degree of autonomy in urban development. In his discussion of urban planning under Chinese economic reforms, Leaf (1998) identified four main factors that contributed to the new changes in urban planning in this period of transition: the increased local autonomy and specialization of Chinese cities, the rapid rise in foreign investment, the strengthened role of the work units, and the rise of both formal and informal land markets. It was within this context of changing conditions that urban planning gained its importance. The most salient feature was the extraordinarily rapid and wide adoption of master plans by Chinese cities to guide their urban physical development, with the top-down plan-making mode still dominating the formulation of these master plans at various levels. The development of master plans relied heavily on the limited professional expertise of planning institutions in the

planning process, whereas implementation was the sole responsibility of local planning bureaus. As Leaf (1998:150) suggests:

> This institutional separation between plan development and implementation has ensured that urban spatial planning plays only minor roles in Chinese cities, as the planning bureaus still tend to be dominated by municipal engineers rather than planners. Decision-making by the bureaus regarding infrastructure investment in particular is based foremost on consideration of economic planning objectives rather than spatial planning goals.

It has been suggested that historic practice has given greatest consideration to rapid economic development rather than to environmental quality, social integration, or rational land use. The problem has been further accentuated by increasing local autonomy, because the growth objectives more clearly fit the parochial interests of local officials (Leaf 1998). In many cases, the circumstances of rapid urban change contrast sharply with the continuity of institutional and political relationships. As some (e.g. Xu and Ng, 1998) have argued, there has been little change in the essence of the traditional planning process, despite the extraordinarily successful economic reforms in China. The process is highly constrained and the involvement of the public and of representatives from non-government sectors in the planning development process is limited (Yeh and Wu 1999; Zhang 2002). The basic problems may best be described as the inability of the local authorities to deal institutionally with the changing socio-economic conditions (Leaf 1998). In Wei's view (2005), the slowness of transitional institutions and the nature of urban planning are not incompatible. However, reform of the planning system has been under discussion since the 1990s in order to bring about institutional changes for effective and responsive planning. According to Zhang (2002), the challenges faced by Chinese urban planners are equity versus efficiency, and power versus democracy. In

sum, urban planning in China has been viewed as an element of economic planning and an instrument of growth, isolated from development strategy and planning implementation (Wei 2005). The next section presents a case study on the master planning process in the city of Dalian, to illustrate the use of SEA in this process.

4.4.2. Case Study: Master Plan for Urban Development in Dalian City

4.4.2.1. Background: The State of Sustainable Development in Dalian

The city of Dalian is located west of the Yellow Sea and east of the Bohai Sea, covering the entire Liaodong Peninsula and 260 surrounding islands and reefs, with a total area of 12,573.85 square kilometers (Dalian Statistic Yearbook, 2005). Geographically, Dalian is a strategic location. It controls the marine gateway to North-east China and Northern China. The city is also a trade and economic center for international cooperative activities because of favorable conditions such as the all-year ice-free port and well developed infrastructure. Since the 1950s, the city has been a center of heavy industry in North-east China. Lastly, Dalian has easy access to North and South Korea and Japan. The city has a population of 5.43 million, including six administration districts, three county-level cities, one county, and four state-level development zones (Dalian Statistic Yearbook, 2005).

The city is well known for its high profile with respect to environmental protection. In the mid-1990s, the municipal government re-identified the direction which development should take from being a heavy industrial base to a finance and high-tech industry center. Subsequently, a new notion of urban planning and development strategy

was introduced by the former Mayor, Bo Xilai, which is reflected in the slogan "Strive not to be the biggest, but the best". What stands out from this strategy is the 'greening project', a series of dramatic changes aimed at improving the city's environmental quality and infrastructure base. The project involved a relocation of heavy industries to the suburban areas, building a shopping and entertainment zone in the city's downtown area, and greening the city through an expansion of lawn coverage and utilization of environmentally friendly technology. Dalian's environmental practice was soon welcomed by the international community. The city was designated one of 10 garden cities by the Chinese government in 1998, and won a UN Habitat Award in 1999 (*Dalian EPB Work Reports 2003, 2005, 2006*). The most recent data suggest a continuing effort on the part of Dalian towards environmental protection:

- 7,180 complaints from the public were dealt with in 2003, down by 26%. Of this, 4,526 complaints related to noise pollution, accounting for 63%; 2,364 related to air pollution; 175 related to water pollution; and 115 related to other types of pollution, which indicated a reduced level of air and water pollution (*Dalian Yearbook 2004).*

- The institutional capacity for maintaining environmental performance has been enhanced over the years (Table 4.5, Shin 2004).

- An innovative strategy of "a contractual system of responsibilities" has been adopted, and has inspired the development of private environmental enterprises in the city (*Dalian EPB Work Report 2005*).

- In 2003, there were 9,802 letters and visits to do with environmental complaints, of which 9,500 cases were settled. The transaction rate of the complaints was 97%, and the satisfaction rate of the public was 98% (*Dalian Yearbook 2004*).

Items	Year 2001
Number of environmental protection projects initiated	84
Investment in pollution protection projects	80.04 million yuan
government subsidy on environmental protection	4.93 million yuan
Utilized foreign loan for environmental protection (10,000 yuan)	2 million yuan
Number of persons in the city EPB	800
Percentage of environmental budget in local revenue	2.05 %
Number of local environmental NGOs	None
Number of citizen complaints	Not available
Number of complaints (actually settled)	Not available

Table 4.5 Selected Indicators of Environmental Institutionalization at Dalian (2001)
Source: Shin (2004)

Ma and Ortolanto (2000) suggested that some Chinese cities may hold the best hope of solving China's environmental problems, and these cities usually meet with three basic conditions: the mayors are environmentally proactive; financial resources are abundant; and international communities are actively involved. They noted that Dalian is such a city, an environmental leader and a positive example for the rest of the country. Of the eight major cities surveyed in China, Economy (2005) found that only in Dalian did a local EPB official indicate awareness of the contract responsibility system which defines mayors' responsibilities in environmental protection and sets the goals for environmental improvement for the forthcoming period. The study demonstrated that officials in Dalian have a higher environmental awareness than those of other Chinese cities. Similarly, Economy attributed the good performance of the city of Dalian to the strong role of its mayor, its solid ties with the international community and the relative wealth of the city. These researchers believed that cities like Dalian have led the way in improving China's

prospects for environmental protection and encouraging her progress towards sustainability. Slowly and gradually, other cities in the country will follow. The case study that follows is such a pilot SEA study, encouraged by SEPA for the purpose of obtaining experience and insights into the application of SEA in China.

4.4.2.2. Applying SEA to the Dalian Master Plan

Urban planning in China has two tiers, the master plan and the detailed plan. The master plan outlines the general land use pattern and development goals and the proposed size of the city, functional land use differentiation and the general layout (Yeh and Wu 1999; Zhang 2002). Although the content of a master plan will vary according to the different local requirements and the state and level of professional support, it should indicate explicitly the long-term development strategies of the city and serve as a basis for the detailed plan (Yeh and Wu 1999). The Dalian Urban Development Master Plan (hereafter called the Master Plan), is such a 20-year, multi-sectoral city development plan drawn up in accordance with the Urban Planning Act 1990. Other important sources drawn upon include the Land Use Management Law (1998), the Environmental Protection Law (1989), the Culture Heritage Protection Law (1992) and the State Council's Notice on enhancing urban planning (1996) (Dalian Master Plan, 2005). The Dalian Master Plan has a planning horizon of 2000 to 2020, and consists of three key elements: the development principles and preferred city size; the spatial lay-out and land use pattern; and the supporting conditions and safeguarding measures (Figure 4.3). The planning development process was conducted between 1996 and 2000: the municipal government set up the task of making the Master Plan in 1996 and the Dalian planning

bureau finished the draft of the plan in four years. Subsequently the plan was approved by the Dalian Municipality, the Dalian's People's Congress, the Liaoning Provincial government and the State People's Congress, in 2000 (Dalian Master Plan 2005)

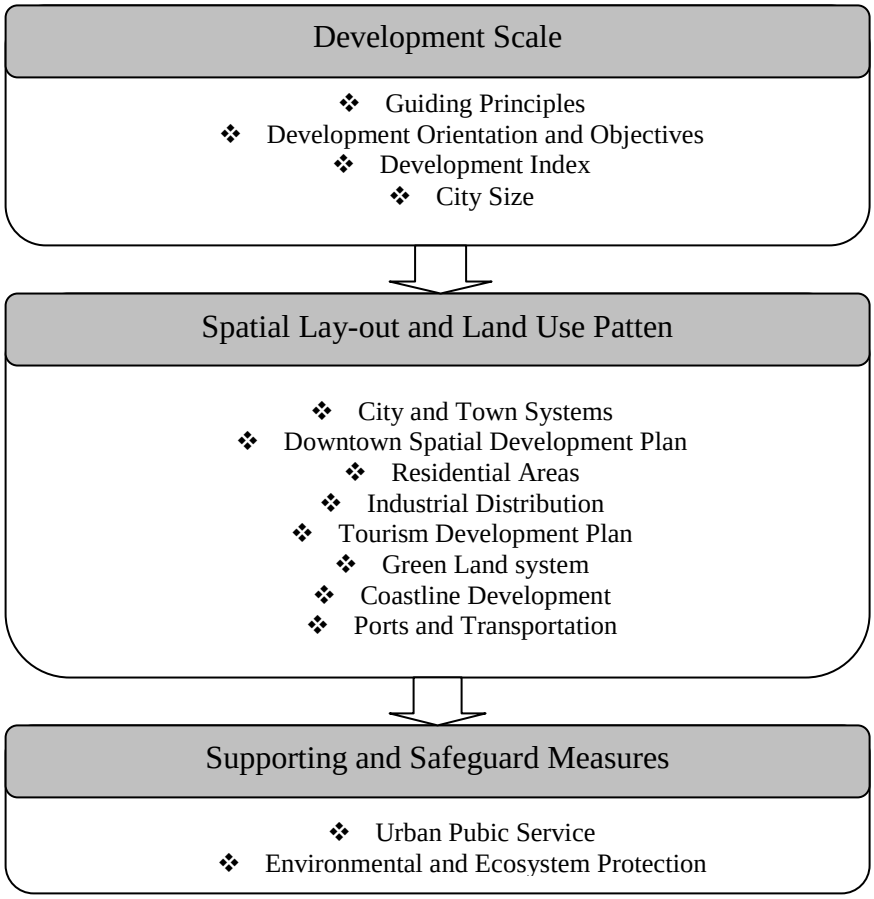

Figure 4.3 Content Structure of the Dalian Master Plan of City Development
Source: DPB (2000): Dalian Master Plan of City Development (2000-2020**)**

Five years after the Master Plan had been officially approved and partly published to the public, the Dalian municipal government selected it as an experimental case for applying SEA to the upper tier of plans. Dalian's SEA practice, referred to as planning assessment (*gui hua huan ping*), started in 2001. Early on, efforts were devoted to the

development of guidelines and to collecting base-line information. As the new SEA requirements were introduced in 2003 through the EIA Law, a number of experimental applications were conducted in industrial park planning. Based on the experience from these sectoral plans, the Dalian municipal government issued the Notice on Implementing Planning Assessment in 2005, which formally identifies three categories of plans and programmes applicable to SEA requirements:

> … the comprehensive/master plans of industry, agriculture, farming, forestry, energy, transportation, town and county planning, tourism, and utilization of natural resources where a written report on the findings of the SEA is required when submitting the plan for approval; the specialized plans of land use and water area management where a formal SEA process is called for in the early planning drafting stage; the master plan for industrial parks and specialized development zones where a written statement of SEA findings is required (*Dalian SEA Work Report, 2005*; unreleased government document).

For the purpose of accomplishing the first formal SEA process undertaken in the Master Plan for city development, the municipality set up a large specialized task force to ensure sufficient financial and political support for the undertaking. The mayor was designated as the group leader. The administrative deputy mayor and 23 directors from various departments and offices were likewise involved. Meanwhile, the SEA expert group from SEPA reviewed Dalian's case and provided a list of guide-points for SEA application in Dalian, which emphasized the need to consider six relationships in an SEA process: size versus quality; competition versus interdependency; city versus industry; economic structure and orientation versus environmental protection; window area versus hinterland; and the long term versus the short term. With regard to enforcing SEA undertakings at Dalian, the expert group identified five critical issues to be addressed in an SEA process:

- Environmental resources requirements for a good plan
- Design of a complete industrial chain that constitutes both the upper and the lower tier of products
- Linkage between relevant policy and regulation and tiering of plans and programs
- Cumulative impacts and butterfly effect within the planning region
- Publicity about government affairs and public participation (*Dalian SEA Work Report 2005*, unreleased government document).

Under the auspices of the Dalian municipal government and Dalian EPB, a formal SEA process applied to the Master Plan was conducted jointly by Tsinghua University and the Dalian Design and Research Institute of Environmental Science (DDRIES) in 2006. The two institutions assumed the primary technical responsibility for Dalian's SEA process and subsequently formulated the SEA report. Clearly it was a retrospective SEA, aiming at evaluating the environmental impacts of the approved Master Plan. The findings may, however, still be beneficial to the Master Plan in that China's master plans are in any case subject to constant change, to cope with new directions in policy or with reform and development requirements (Wei 2005).

Dalian's SEA report consists of 10 chapters, the first two dealing with the guiding principles of the SEA process, an overview of the Master Plan and identification of possible environmental factors for assessment. Chapter three outlines the quality of Dalian's critical biophysical factors, including air, water, noise, solid waste, land and coastal conditions. Those factors plus the institutional capacity for environmental protection were viewed as the key environmental elements for assessment. Chapter four analyzes the city's industrial development and structure. Chapters five and six address Dalian's ecological feasibility space and environmental carrying capacity. Chapter seven explains how the public was involved in the process and indicates that two types of

public participation were used: expert consultation and a questionnaire survey among the general public. Chapters eight and nine are a summary of the SEA process and its relevant supporting conditions for implementation. The last chapter consists of a conclusion and recommendation. The report concluded that the Master Plan provided good guidance and orientation for Dalian's development in the next two decades ((*Dalian Master Plan SEA Report 2006*, unreleased government document). The report was submitted to both the Dalian municipal government and SEPA for approval. However, by the end of the period of this research, there was still no evidence that the findings derived from Dalian's application of SEA had been used in practice to revise the Master Plan. The following section describes in detail the guiding principles adopted and the institutional arrangements for Dalian's SEA application.

4.4.2.3. Guiding Principles for Dalian's SEA Application

According to the SEA report, the use of SEA in the Dalian Master Plan was governed by six principles, which are based on a synthesis of guidelines and suggestions made by the Dalian municipal government and the experts from SEPA. The principles are:

- Objectivity and fairness: assessing direct and indirect plans and the potential impacts of the Plan from a fair and objective perspective;
- Consistency: co-ordinating with related policies, plans, and programs, being tiered to related policies
- Systematic principles: considering social, economic and environmental sub-systems to seek sustainability for the Plan
- Circular Economy Principle: optimizing production through increasing energy efficiency and reducing materials costs
- Precautionary: considering uncertainty in terms of industrial economic development and all the risks that involves

- Practical Principle: utilizing those methods that are readily operational and generating recommendations that can be implemented (*Dalian SEA Report of the Master Plan, 2006*, unreleased government document).

4.4.2.4. Existing Institutional Arrangements for SEA Application

Formally, the SEA process for the Master Plan was led by the municipal government, with the mayor and deputy mayor acting as group leaders. The Dalian Environmental Protection Bureau (DEPB) was just one participating agency among 23 government departments and agencies (Dalian SEA Work Report 2006), although in practice, it was the DEPB that took full responsibility for applying an SEA process to the Master Plan. The DEPB entrusted to three qualified research institutes the joint task of applying an SEA procedure to the Master Plan and drawing up a complete written report. The three institutes first of all developed a written report on the SEA technical scheme applicable to Dalian's Master Plan and then went through a process of argument and demonstration at Beijing. The complete SEA report was next written and sent out to all relevant departments and agencies for their opinions and comments, following which the DEPB sent the final report to both the municipal government and SEPA for approval. The planning agency, the Dalian Planning Bureau (DPB), was not an active player in the whole process, although it was involved in the phase of reviewing the report before it was formally submitted. Similarly the supervising agency, the Dalian Development and Reform Commission (DDRC), did not play any part in the process, perhaps because the SEA process was undertaken after the Master Plan had been formally approved and published and there was no necessity to legitimate it. Also, under the dual system of environmental protection management, the SEPA was actively involved in Dalian's SEA

case in order to promote the wide application of SEA, which might have undermined the local supervising agency's effort on the case. More specifically, Dalian's SEA process involves a number of government agencies, whose roles and responsibilities are presented below.

- ***Dalian Development and Reform Commission (DDRC)***

The Dalian Development and Reform Commission (DDRC) is a macro-economic regulatory agency under the Dalian Municipal Government. In the Chinese top-down planning system, the commission undertakes the important function of formulating plans and policies related to economic and social development. Of 14 major tasks and responsibilities of the Commission, comprehensive policy and plan-making is a high priority. Specifically, the Commission is responsible for:

- studying and formulating strategies for municipal economic and social development
- putting forward objectives and policies and plans for medium- and long-term economic development (for instance, the 11th Five-year Plan)
- proposing development strategies and key policy measures for urbanization; and
- coordinating various municipal sectoral development plans and urban spatial plans (DDRC website, 2006).

Last but not least, developing and formulating a sustainability strategy is an important task of the Commission, which focuses not only on promoting such a sustainability strategy but also encouraging a recycling economy, and drafting the plans for comprehensive utilization and conservation of resources. Clearly, the Commission exercises an unparalleled leading and guiding role in the Chinese planning system. The well-known Five-year Plan, for example, is an over-arching guiding plan to which both urban spatial plans and sectoral development plans are strictly subject. Both Dalian's

Master Plan and the SEA report are based on the 11th Five-year Plan for the Dalian economy and social development. Another important guiding plan formulated by the DDRC is the planning policy for development of Dalian and its surrounding area, which outlines the development direction and priorities of the city over the next 20 years. The utilization of SEA and sustainability consideration to the plans and policies formulated by the DDRC are crucial to the ultimate purpose and wide application of SEA in China. Unfortunately, under the new Chinese EIA law, policies and plans formulated by the DDRC are exempt from SEA requirements because of multiple political and social considerations. The Chinese government may be unwilling to reveal confidential plans and policies, or to commit to the interactions and cooperative and open activity that SEA requires. Political/institutional willingness at the local level is a key factor in the success of any SEA application. With regard to the case under investigation, the DDRC is the nominal leading agency and the higher supervising agency, in charge of approving both the Master Plan and the SEA written report. We have already noted that the leading role of the DDRC in the SEA process was hard to determine in this case. As we have seen, the process was launched by the SEPA and DEPB as a pilot SEA study, and the DDRC did not take on any supervising or approving responsibilities. It simply provided comments on the written SEA report in the last phase of the process. Also, the importance of the role of SEA in guiding plan-making was not stressed in DDRC documents and work reports.

- ***Dalian Planning Bureau (DPB)***

Founded in 2004, the Dalian Planning Bureau is a functional agency under the Municipal Government in charge of urban spatial and township planning in the city of

Dalian. The predecessor of DPB was the Dalian Planning and Land Resources Bureau, which had the added responsibility for land use registration and housing management (DPB 2006). The restructured DPB has given prominence to development of urban spatial lay-out and land use plans, and exercises exclusive planning functions. As has been noted, there are two hierarchical urban plans formulated by DPB: a City Master Plan and a City Detailed Plan. Both are statutory plans and are required to be drawn up in accordance with Urban Planning Law. This study has primarily focused on issues related to formulation and evaluation of the “City Master Plan (2000-2020)". The function of DPB is divided into managing and designing. The former is responsible for implementing land use policy and regulations, while the latter generates the master plans and detailed controlling plans. The DPB is the plan-making agency of the city development Master Plan. According to the SEA requirements stipulated in the EIA law, the responsibility for applying an SEA process procedure to this master plan should lie with the DPB. The DPB should either have undertaken a SEA process on its own or entrusted a qualified institute to make the assessment. Obviously, the proposed SEA task was not accomplished by the DPB.

- ***Dalian Environmental Protection Bureau (DEPB)***

Environmental protection has a high profile in Dalian, and is led and managed by the Dalian Environmental Protection Bureau (DEPB). As with most cities in China, the status and power of the DPB has been intensified with the enactment of EIA law, particularly with wide application of EIA in the past two decades. Specifically, DPB is in charge of approving the EIA reports on construction, reconstruction, extension projects; instructing the establishment about environmental treatment measures; and implementing

the environmental administration rules on pollution discharge registration and pollution discharge requirements (DEPB 2006; Economy 2005). In sum, the DEPB bears most of the environmental protection responsibilities of the city. At the time of the case under investigation, full responsibility for SEA application lay with the DEPB. Although the DPB has increasingly participated in environmental and urban planning processes, most of the time it has acted as a consulting agent and played only a marginal role in decision-making. In the Dalian Master Plan, considerations of environmental issues were included but were categorized as supporting conditions or as safeguarding measures for when the Plan would be implemented (see Figure 4.3). The environmental concerns at the time of plan-making were *ex post facto* (retroactive) in nature, no assessment having been conducted before any decisions had been made regarding the impacts that might be caused by the plan. It was clear that in the Dalian SEA case, the DEPB made a great effort and provided both the financial and the institutional support to ensure the success of the SEA process. Such an attempt was partly because the long-time effort of the Chinese environmental protection authorities to obtain a more powerful status in the decision-making process. As far as this case is concerned, the DEPB was the leading agency that took full responsibility for SEA undertakings.

- ***Dalian Design and Research Institute of Environmental Science (DDRIES)***

At the local level in China there are two broad groups of organizations in each environmental protection agency. The first group consists of the departments and offices responsible for daily administrative management. The functions of these departments are general administration, formulation of environment-related documents and regulations, project-level EIA applications, pollution control, conservation of natural resources and

international cooperation. These offices and departments are under the direct control of the agency's director and have higher administrative status than those in the second group of environmental authorities, which consists of affiliated research and monitoring organizations. These provide monitoring of environmental information data, undertake environmental research and study projects, and specialize in particular environmental problems such as automobile gas emissions. Though these organizations occupy a lower position in the institutional structure, they have played a significant role in the environmental policy implementation because of the professionalism with which they have performed (Shin 2004). The DEPB has a similar two-level organizational structure. For instance, the Dalian Municipal Design and Research Institute of Environmental Science (DDRIES) is a vital addition to DEPB and an active player in the realm of environmental protection (Figure 4.4). It is a very comprehensive research and policy center that conducts various research projects on environmental science, regional environmental planning, EIA, and environmental risk assessment (Shin 2004). Technically, the SEA process was undertaken jointly by the DDRIES, Tsinghua University and the State Environmental Science Institute. The DDRIES participated in the formal SEA process of preparing the baseline information, investigation, analysis and evaluation of status. The report of the assessment results was written up by Tsinghua University. As an affiliated department of the Environmental Bureau, it is clear that DDRIES is mainly responsible for the technical aspects of SEA application, and that its formal role in the SEA process is advisory.

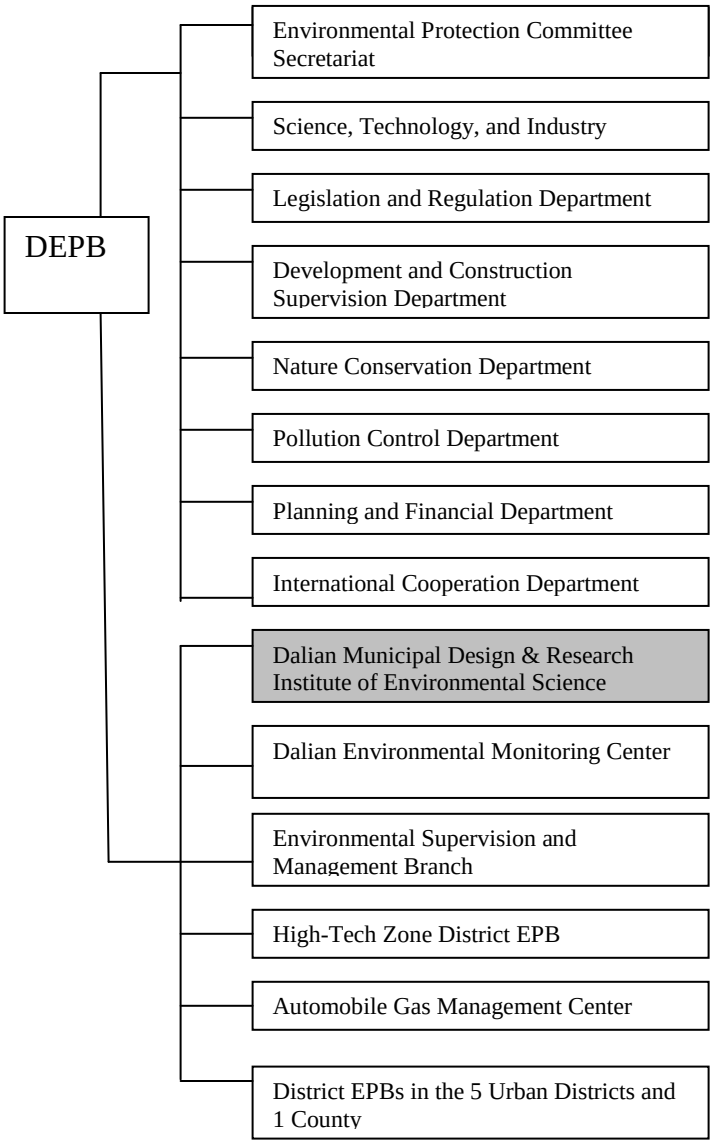

Figure 4.4 Organizational Structure of the Dalian Environmental Protection Bureau
Source: Shin (2004)

4.5. SUMMARY

This chapter has presented the full spectrum of sustainable development problems encountered in contemporary China. China's environmental policy has gone through several phases, which have featured a growing environmental awareness and increasingly active government engagement in international issues. The factors that limit the

implementation of sustainability include the mixed role of cultural traditions, changing political circumstances and a growing reliance on local government, and a persistently conservative ideology toward environment protection. To help understand China's sustainable development, four features have been highlighted: the fact that a growth-oriented view of economic development in pursuit of sustainability has been an enduring feature of China's contemporary history; the emphasis has been on pollution control aftermath instead of prevention, and on technical solutions to pollution rather than on capacity-building; public participation has been limited and problematic; and China's environmental policy and practice has been influenced by promoting technocrats to leading political positions. However, of all the changes and transformations in Chinese society, the ideological shift from pure pursuit of economic development to building a 'harmonious society' is the most significant and may have imponderable implications for China's environmental policy and practice. The focus or goal of a harmonious society is to develop a new model of development that features the circular economy, sustainable environment and socialist democracy. As has been noted by Breslin (1996), to a large extent it is the role of local leadership that will define the failure or success of China's environmental policy. Hopes lie with those cities that are led by an environmentally proactive leader, are endowed with sufficient financial resources, and are tied to international communities. Dalian is one such city which is why it was selected as the location for this case study. The City's development Master Plan for the period 2000 to 2020 was formulated and approved in 2000. The SEA process was applied to this Master Plan in 2005 and it was the city's first formal SEA process applied at the Master Plan level. The case of SEA in Dalian has been introduced with a focus on explaining the

guiding principles and institutional arrangements. The following chapters will concentrate on assessing Dalian's first SEA case against the set of sustainability-based criteria outlined in Chapter Three, and on analyzing the relevant institutional arrangements.

CHAPTER 5 TESTING SUSTAINABILITY IN THE DALIAN SEA CASE

5.1. INTRODUCTION

Sustainability-oriented principles were not explicitly stated in the Dalian's SEA report. The evaluation report compiled jointly by the Dalian Environmental Science and Research Institute and Tsinghua University, described in Chapter Four, presented a set of six guiding principles that were used to guide the SEA process. Obviously, these principles addressed some sustainability concerns and might be seen as a first attempt to identify relevant criteria when implementing SEA. The analysis contained in this chapter, however, will examine whether sustainability principles have played a major or minor role in guiding Dalian's SEA implementation. Most importantly, there is in general little use of integrated sustainability principles in China. Specifically, Chapter Five will analyze and interpret the research findings around five criteria previously outlined in Chapter Three, with a focus on the degree to which those criteria have been met or considered in Dalian's SEA process. It will conclude with the issue of their applicability in Chinese municipal circumstances. The five principle-based criteria utilized in this research were tested informally through various methods – surveys, interviews with key informants and direct observation of Dalian's SEA process, which evidently posed tremendous challenges for both the planning and the assessment mechanisms in the city. As will be demonstrated in the following sections, Dalian has its own particularities, so that the strengths and weaknesses identified from these findings will not necessarily be applicable to other circumstances in China or, indeed, to other developing countries. Some of the resolutions indicated may be generally applicable to the Chinese urban cities

while others may apply only to the coastal cities that show advanced economic development and openness, such as Dalian itself. Nevertheless, some resolutions might be applied throughout the world in urban municipalities.

5.2. EQUITY: A SIGNIFICANT BUT CONTENTIOUS PRINCIPLE

As discussed in Chapter Three, the sustainability principles used as criteria to assess urban progress towards sustainability in general and SEA in particular are equity, efficiency, participation, precaution and adaptation, and integration. Of all the sustainability principles applied in the Dalian SEA case, the equity principle was most notable by its absence throughout the assessment activities. The principle appeared exclusively on paper and was presented as little more than a statement of desirable objectives. It was accompanied with expressions like "should" and "seek to" rather than definite measures or plans for implementation. In line with the previous analysis of the concept of sustainable development in Chapter Three, the equity principle considers two tests: is it the plan equitable for the present generation? and is it equitable for future generations?

Practitioners' identification of the Principle of Equity in Dalian's SEA Process (%)

Question 1: Did the SEA process address social equity concerns?
Question 2: Was the well-being of future generations considered in the SEA?

	YES	NO	UNKNOWN	N[5]
Intra-generational Equity	64.4	22.2	13.3	45
Inter-generational Equity	46.8	48.9	4.3	47

Table 5.1 Practitioners' Identification of the Principle of Equity in Dalian's SEA Process

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[5] "N" Column in this table and all the following survey results tables reports the number of respondents involved.

As for the intra-generational equity criteria assessed by the survey, rather over three-fifths (64.4%) of those governmental officials and practitioners surveyed indicated that these equity concerns had been considered in the SEA, and roughly one-fifth (22.2%) and one-tenth (13.3%) of respondents either said "no" or admitted they were "not sure" whether the issue had been covered. However, in reviewing the SEA process in Dalian, it was found that none of the following key elements of intra-generational equity had been dealt with in the SEA process applied to the Master Plan: any disadvantaged or marginal individuals or groups affected by the city development plan were not identified appropriately; the impacts on them were not assessed through a full social impact assessment; no provision was made for the participation of affected minority groups or the least advantaged in the decision-making; and it was not clear how the interests of the disadvantaged had been taken into account in decision-making. One likely explanation of the variance between the results of the SEA practice and those of the survey is that the equity issue has been a high-profile tool of political propaganda and was referred to in development planning at all levels, the Chinese media as well. But the significance of equity traditionally remained at the conceptual or superficial level, and it was seldom, if ever, delivered in Chinese development planning practice. For most SEA practitioners, equity is undoubtedly a familiar and important concept in the Chinese political environment. Yet they did not have the motivation to challenge the real implications underlying it or to put it into effect. As a rule, if the planning and assessment reports contain wordings like "equity is considered in the assessment process"; one would think that this requirement had been met safely technically and politically. All this tended to suggest that social aspects of an SEA or a full social impact assessment are substantially

avoided in China. A governmental official (Personal communication, DDRIES official, Dalian, August 2006), stressed at the interview:

> As China continues to pursue a rapid pace of economic development, the social aspects of development have become more apparent than ever. In view of the complexity of population problems, there are emerging issues of increasing unemployment, growth of the urban poor, and the gap between urban and rural, etc. In the development process, disadvantaged groups have been growing increasingly more vulnerable to development-induced change than other groups. Therefore, assessment and mitigation of social consequences could be the most important part of both SEA and EIA activities in a future China in order to ensure social stability, and more meaningfully, to achieve the goal of building a harmonious society designed by the new leadership. In implementing the equity principle in China's SEA, two problems emerged: technically, how to use the principle to assess and mitigate the impacts on people affected; and politically, to what degree the local governments are willing to countenance a trade-off between economic benefits and social or environmental well-being.

It was apparent that the equity issue in China involved some degree of political sensitivity. Some officials interviewed made comments on the matter with caution, either by stressing that the issue was high on the government agenda without giving a detailed explanation, or by purposely avoiding the topic. Nevertheless the study results indicated that the perception of the significance of intra-generational equity issue generally existed in Dalian's SEA, though implementation of the principle lacks substantial content, and requires both political motivation and technical assistance.

There was a simple failure to deal with the principle of inter-generational equity in Dalian. From a strong sustainability perspective, the Dalian SEA application failed to identify any potential critical ecosystem factors that might be affected by development planning, nor to consider fully measures to mitigate the risks of serious impact down to a zero adverse effect. Even under sustainability criteria, the failure to apply the principle

was proven by the fact that there was a serious lack of any capability to carry out an appropriate socio-economic appraisal. Socio-economic appraisal is critical in identifying the form of capital that has been converted from the natural capital depleted through development projects, so as to demonstrate the principle of conservation of both natural and man-made capital. In terms of global impacts related to the principle, Dalian's SEA participation and mitigation processes were also limited to local issues; those of national or global significance, such as biodiversity and the greenhouse effect, were not covered in the assessment process.

The findings from the two criteria questions designed for testing the equity principle may provide helpful insights into Chin's interpretation of, and the particular emphasis it lays on, the concept of sustainability which we discussed in Chapter Three. If SEA is to be used as a test for sustainable development, it should test whether the two aspects of the equity principle are upheld. The review of the Dalian SEA process indicated that both tests had been demonstrably missing, although the survey results suggested that to a certain degree the responding practitioners had identified the existence and the use of equity principle in the assessment process (see Table 5.1). In fact, the Dalian process concentrated exclusively on scientific and technical assessment of the carrying capacity of the physical environment. Insufficient attention was paid to the social aspects of SEA, particularly with respect to the issues of equity and public participation. Furthermore, there is growing evidence that the inter-generational principle was not working well in a Chinese context where economic development remains a national priority for the eradication of poverty, and where it is clear that SEAs'

assessment and mitigation processes have focused on those impacts that are more immediate and reflect local interests (Che *et al.* 2002; Wang *et al.* 2003).

A question frequently raised by international academicians is the suitability and applicability of the inter-generation principle in the context of a developing country such as China, where the priority has been the requirement to meet the basic needs of its present citizens and of economic development. Mitchell (2002:81) also explicitly pointed out that while developed countries have focused considerable attention upon inter-generational equity issues, the focus of developing countries has been more upon intra-generational issues. Thus, there has been understandable resentment from developing countries when industrialized nations have urged them to modify their economic activities to avoid destruction of resources of global value. This resentment was evidently supported by a government official who participated in this research (Personal Communication, DDRC officials, Dalian, August 2006). This official indicated that sustainable development, essentially, is a concept that upholds Western capitalist values. The core sustainability principles such as inter-generational equity were designed to support traditional capitalist systems; therefore many of them, if not all, were not acceptable to developing countries on ideological grounds. In addition, in the social and political Chinese context, the concept of fairness was more acceptable and widely used. For instance, of the six principles identified in the SEA report, fairness was adopted to guide the process, though no elaboration was provided to specify the detailed criteria embedded in the principle. China is a socialist country, which denies the existence of social classes politically. While equity refers to fair distribution of resource among of all

social classes, concept of fairness, in the other hand, is absence of any bias and discrimination. It is clear that concept of fairness has solider cultural and social ground for adoption than equity.

Interestingly, the relatively low percentage (4.3%) of "Unknown" responses to the inter-generational equity issue showed that the practitioners surveyed acknowledged that the issue should be considered at the plan and program level of the SEA process. In addition, the data from the survey concerning the perception of use of the principle also indicated that the difference in the percentage of people who assumed that the criterion would be applied and that of people who did not was not significant (z-value=-0.44, p-value=1.34). Given the conflicting observations and the evidence drawn from the survey, it was apparent that no conclusion can be reached at this stage as to whether or not the inter-generational equity issues have aroused a marked level of attention in China, nor to what extent the issues were perceived as an integral part of a sustainability test. For instance, a high proportion (78%) of the respondents in the Dalian Environmental Bureau thought that Dalian's SEA involved considerations of the issue of inter-generational equity, while the responses from the planning respondents demonstrated a quite opposite result, with only 12.5% believing equity had been considered (Table 5.2). The substantial gap disparity between the two departments might be explained by the fact that responsibility for promoting and addressing sustainability concerns in China lies more with the environmental authorities than with other ministries. The view was buttressed by the Chinese perception of sustainability as discussed in Chapter Four: it carries more limited environmental implications than it does social and economic considerations.

Practitioners' Identification of the Equity Principle in Dalian's SEA Process (%)

Question 1: Did the SEA process address social equity concerns?
Question 2: Was future generations' well-being considered in the SEA?

	Intra-generational Equity				Inter-generational Equity			
	Yes	No	Unknown	N	Yes	No	Unknown	N
Dalian Development and Reform Commission (DDRC)	66.7	22.2	11.1	9	50	50	0	10
Dalian Planning Bureau (DPB)	75.0	12.5	12.5	8	12.5	75.0	12.5	8
Dalian Environmental Protection Bureau (DEPB)	33.3	33.3	33.3	9	77.8	11.1	11.1	9
Dalian Design and Research Institute (DDRIES)	73.5	21.1	5.3	19	45.0	55.0	5.0	20

Table 5.2 Practitioners' Identification of the Equity Principle in Four Government Departments

5.3. EFFICIENCY: A GENERALLY RECOGNIZED AND ACCEPTED PRINCIPLE

Of the five principles applied in this Dalian SEA case, efficiency was the most widely accepted and acknowledged principle. This finding was confirmed by the key informant interviews, the survey and other secondary data. Three governmental officials commented in the interviews that one of the immediate sustainable challenges perceived by them was resources maintenance and energy consumption (Informant #1, Informant #3, Informant #4, Personal Communication, officials from DDREIS, DDRC, August 2006). China's energy consumption has doubled since the 1980s, and is expected to double again within the next two decades (Wang and Li 2005). The consequences of China's energy production and consumption inevitably have serious implications, both domestic and global. They will determine economic growth, environmental concerns,

regulation and policy reform as well as technological progress both in China and in the surrounding areas. Therefore, in the government's view, increasing the efficiency of resources and energy use is China's most urgent task in its journey towards sustainability. From the environmental assessment perspective, with respect to the social impact of energy consumption, the use of coal, nuclear power and hydroelectric projects is becoming an increasingly salient issue. An official pointed out that

> Coal has been recognized as the single biggest cause of China's environmental degradation, accounting for 64% of the national energy consumption, and 26% of the world's total. But there is little doubt that coal consumption will continue to increase. The reason behind this is the limited reserves of oil and gas on the one hand, and the risks involved in the development of projects using nuclear power, natural gas or hydroelectricity. In this context, the Chinese leadership has tended to rest its hopes with technological advancements to minimize environmental degradation. Policy or structural reform on energy pricing, distribution or consumption patterns is gradually getting under way too, but is seen as less important (informant #3, DDRC official, Dalian, August 2006).

In the case of Dalian's SEA, efficiency was presented as one of the guiding principles. It stipulates that the assessment process should optimize production through increasing energy efficiency and reducing the cost of materials. In this sense, Dalian's efficiency principles were derived from production theory – namely, the ratio of energy or labor output divided by energy input in order to optimize the industrial process regarding use of resources and waste emissions (Hermans and Knippenberg 2006). The process avoided the consideration of ecological efficiency, associated with the functioning of an ecosystem. This might reflect a prevailing tendency among Chinese policy and decision-makers to allow economic factors to play a dominant role in shaping the welfare of Chinese society. When respondents were asked whether the SEA encouraged reduction in resources and energy use, roughly two-thirds of people surveyed confirmed the use of the

efficiency principle, while a much smaller proportion (10-15%) thought efficiency was either not incorporated or were not certain of the application (Table 5.3).

Practitioners' Identification of Efficiency Principle used in Dalian's SEA (%)

Question 3: Did the SEA process in Dalian encourage reduction in absolute resource and energy use?

	Yes	No	Unknown	N
Efficiency Principle	74.5	10.6	14.9	47

Table 5.3 Practitioners' Identification of Efficiency Principle Used in Dalian's SEA

It is worth noting that the concept of efficiency has no moral or ethical implication (Hermans and Knippenberg 2006). It was important to incorporate the relevant context where it was applied. In the case of Dalian's SEA, because sustainability was not clearly stated as a desirable assessment objective, the analysis conducted by the practitioners primarily concentrated on industrial development and economic growth. In discussing the development of the city's industrial structure, the analysis and forecast stressed the thermodynamic definition of efficiency, and extended to the principle of circular economy (*DEPB SEA Work Report, 2006,* unreleased government document). The assessment process was weak in dealing with the ecological and welfare economics aspects of efficiency. For instance, the city's efforts to transform a heavy industrial center in north China into a finance and high-tech hub in Asia for the next two decades had involved the closing down or re-structuring over 150 heavy industry factories of the city by 2006. Approximately 100,000 workers in Dalian lost their jobs annually in this transformation process (Dai 2006). An official in the interview commented that the action was desirable only because it was optimal from a production theory perspective and

contributed to the city's economic competitiveness (informant #2, Personal Communication, DPB official, Dalian, August 2006). This respondent further explained that although a large number of industrial workers became victims of the policy change, in the long run the returns from the transformation compensates these adversely affected groups through an improved livelihood and opportunities. The critical question regarding the decision-making and sustainability concerns raised in this context are: can equity be traded off for efficiency in development planning? If the trade-offs are inevitable, have all affected groups and individuals been satisfactorily compensated in the plan or assessment processes? Dalian's SEA case did not answer this question. It was implied that without specifying different definitions of efficiency utilized in the assessment and being combined with other criteria of basic requirements for sustainability attempt, the principle might be used as a justification for actions geared to purely economic interests.

Efficiency criteria also can be extended to evaluate the content and process of SEA. For SEA to be use used as an effective tool for any progress towards sustainability, the SEA process should merge into the existing system with a practical focus on current priorities. In Dalian's case, the survey indicated that the greatest perceived efficiency problem of conducting SEA by the practitioners in Dalian was the extra cost caused by use of SEA or implementation of the results (Table 5.4).

Practitioners' Perception of Efficiency Problems in Dalian's SEA Process (%)

Question 4: What were the efficiency problems you perceived in the use of SEA in development planning?

Efficiency Problem	Percentage	Sample Size
Lack of Focus	27.7	47
Time-consuming	17	
Extra cost from structural problems	78.7	

Others[6]	19.1

Table 5.4 Practitioners' Perception of Efficiency Problems in Dalian's SEA Process

Up to 78.7% of respondents believed that because the existing planning and assessment systems were not supportive, the use and implementation of SEA might have only marginal benefits. Lack of focus on the priorities in order to cover the breadth of development was perceived as the second most concerning problem in the survey (27.7%).Another 17% of practitioners thought the SEA process was complicated and time-consuming, while some 19.1% of respondents suggested other efficiency problems such as the excessive human and financial resources required by the SEA process and felt that it was procedurally undesirable in contrast to that of a project EIA. Dalian's SEA primarily considered the environmental conditions implied by the city's space change and industrial development in the period from 2000 to 2020 (*SEA Report, 2006*, unreleased government document). The assessment priorities were not clearly indicated from the outset, though the practice process demonstrated the inclination to concentrate on the most visible physical environmental problems such as air, water, land and solid waste. As such, information provided was not sufficient for development planning and decision-making, particularly with regard to issues such as risks, cumulative effects, bio-diversity, health and so on. Lack of concentration on the key issues of development also seriously influenced the quality of usable information provided by the SEA undertakings. In addition, given that the assessment process was carried out after the plan had been legally approved and suggestions derived from the SEA applications may only be used in

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[6] Two respondents in the survey provided their own answers. One suggested that SEA requires too much in the way of human and financial resources; the other thought that SEA was not necessarily different from the project EIA

revising the Master Plan in the future, the effect of such an assessment may be seriously questioned.

5.4. PARTICIPATION: AN UNFULFILLED PRINCIPLE

Both the SEA guidelines stipulated by SEPA and the SEA report stressed that public involvement was one important step in the assessment process. In the city of Dalian, the citizens could express their concerns regarding the city development plans and relevant environmental issues through several means, each of which were outlined below (Ma and Ortolano 2000; Dalian China 2006):

1) Visits and letters: an approach by which citizens pay visits or write letters to the relevant governmental agencies to register complaints or express their concerns. For instance, for environmental problems, the citizens can address the following government agencies: DEPB—the DEPB has a "complaint division" to hear the public's concerns on various environmental issues; the Mayor's office – Dalian has appointed a deputy Mayor whose responsibilities include environmental protection and accepting citizen complaints on environmental issues; and the Dalian People's Congress – the citizens have laid their environmental concerns before their elected representative on the people's congress and before the staff of the urban construction and environmental protection committee.

2) 24-hour hotlines—Dalian has installed 24-hour hotlines to receive complaints about the environment. The city also has a radio talk show that gives people an opportunity to discuss their environmental concerns.

3) The courts: citizens also have the right to sue companies that pollute, or DEPBs that fail to implement national laws.

In fact, all of these are reactive channels to existing environmental problems. The inputs of the public in the stage of plan-making are not considered. The citizens have no access to the government plans. Specifically, these existing channels allowed citizens to complain only after any negative effects of development projects had become apparent, and there was no systematic means for expressing dissatisfaction about proposed projects, plans or programs before decisions were made. It was rare for the public's opinion to be translated into actual political impact. When reviewing Dalian's SEA case, the evidence suggested that public participation did take place in Dalian's SEA process. However, it was questionable whether such participation contributed to the assessment in any meaningful way. A government staff member commented on his survey that participation presented nothing more than a technical requirement to complete the EIA or SEA process in Dalian or China (Survey Comments, DPB official, Dalian August 2006). The inclusion of this requirement in a Chinese assessment context was partly due to China's desire to become part of the international community through adopting international prevailing practice (Wang *et al*. 2003). In addition to the low regard for public participation by the government officials, the general public's own expectations for their involvement and influence on environmental issues has been weak. As revealed by Lee (2005:56) in his study of public environmental consciousness in China:

> Instead of policies being informed or influenced by public opinion, it is the public's own environmental perceptions of the environment that are being shaped by state policies propagated by the media. … As a result, members of the public are not able to push for any viable alternative – and are not particularly interested in doing so.

Based on several recent studies regarding the strength of Chinese public opinion about environmental quality, Lee further concluded (p.57):

> …when it comes to evaluating the actual impact of pro-environmental opinion, instead of public concern, it is actually the concern of local governmental officials entrusted with the responsibility for environmental management that matters.

Apparently, Dalian's SEA process was no exception to this conclusion. First, the process failed to involve all the genuine stakeholders who might be affected. The SEA report identified three types of stakeholders involved in the process: experts from different fields, government staff, and the general public. The experts were consulted with questions regarding the development strategy and the possible impacts of development. A sampling survey was used among the government staff and the general public to collect baseline information on the most contentious development and environmental issues (SEA report, Dalian, 2006, unreleased government document). The survey conducted in this research revealed that the local government officials had a relatively higher regard for the inclusion of environmental experts, decision-makers, and planning professionals than for the active groups of ENGOs or disadvantaged groups (Table 5.5).

Practitioners' Identification of the Stakeholders in the SEA (%)	
Question 5: Who was involved in Dalian's SEA process?	
The environmental experts	83
The decision-makers	72.3
The general public	72.3
The planners	61.7
The environmental authorities	51.5
The environmental NGOs (ENGOs)	46.8
The marginalized groups affected	40.4

Table 5.5 Practitioners' Identification of the Stakeholders in the SEA Process

Although seven groups were identified by the practitioners, the actual processes involved only three types of groups listed in the Table: the environmental authorities, the general public and the environmental experts. There was no evidence of input from the decision-makers, ENGOs, and the disadvantaged groups affected. Secondly, the degree of public involvement ranged between non-participation and tokenism according to Arnstein's categorization (1969). The public's opinion was not translated and considered when making decisions. As revealed by the SEA report, there were three types of public participation: the experts' consultation, the questionnaire survey among the 13 relevant departments, and the questionnaire survey with the general public in six administrative districts of Dalian. The consultation among the experts and the survey questionnaire was undertaken after the major assessment decisions regarding the scope, purpose and methods had been made. It primarily dealt with the most severe environmental problems perceived by the respondents, and their preferences for the city's development priorities. The SEA report summarized the experts' opinions and the general public perceptions without indicating their implications to the assessment results as well as the role of information conveyed by the public.

An official suggested in an interview that China's public participation requirement in the assessment process was the by-product of foreign assistant agencies that have included it as one of the key loan conditions since the early 1990s (Informant #4, DDRC official, Dalian, August 2006). That is to say, he further stressed, it is not an imperative appeal generated from the bottom; instead, it is the government authorities who introduced the concept in China's EIA and SEA process. Unfortunately, China's

planning and assessment systems are not ready to facilitate broad involvement of all stakeholders, and the public has not yet been convinced to fully commit to addressing their environmental concerns. Except for the political culture factor, the official suggested that institutional barriers were the most serious problem when involving the public in addressing environmental issues (informant #4, DDRC official, Dalian, August 2006). The survey results revealed similar views (see Table 5.6): 66% of respondents suggested that the decision-making process, deficient in transparency and openness, excludes the public from meaningful involvement, and 44.7% of those surveyed indicated that public involvement had not been institutionally channeled. The problems of lack of access to information and lack of effective communication between the public and the government accounted for 36.2 and 29.8 respectively.

Practitioners' Perception of the Key Problems of Public Participation in Dalian's SEA (%)	
Question 6: What are the key problems for broad participation in Dalian's planning and assessment process?	
Lack of transparency and openness of decision-making	66.0
Lack of effective channels	44.7
Inaccessibility to information	36.2
Lack of communication	29.8
Others	2.1

Table 5.6 Practitioners' Perception of the Key Problems of Public Participation in Dalian's SEA

5.5. PRECAUTION AND ADAPTATION: A CHALLENGING PRINCIPLE

Not surprisingly, the "control and command" system in China has created a major obstacle to pursuing the precautionary and adaptive principle in the SEA process. As described in the previous chapter, the Master Plan had been officially approved before this formal SEA process was undertaken. Procedurally, no major changes would be made to the Plan even if the precautionary principle were used and suggested opposing views

or alternatives regarding the city's development policies and measures to be taken. The use of SEA in this case is retrospective. The Master Plan is subject to constant change because of the transitional context of contemporary China, and the findings may be considered for future revision. The survey data revealed that over half (55.3%) of respondents acknowledge the use of the precautionary principle in the SEA process in dealing with uncertainty and complexity. Approximately one-third of respondents (31.9%) had reservations about whether the principle was considered in the process and another 12.8% of respondents thought that Dalian's SEA did not consider other alternatives for development in the Master Plan.

Practitioners' Perception of the Use of the Precautionary Principle in Dalian's SEA (%)

Question 7: Did the SEA consider the alternative of taking no action on the policy issues or prohibiting development in face of uncertainty and complexity?

	Yes	No	Unknown	N
The Precautionary Principle	55.3	12.8	31.9	47

Table 5.7 Practitioners' Perception of the Use of the Precautionary Principle in Dalian's SEA

Another problem with the use of the precautionary principle was the timing of the SEA process. A rationale for applying an SEA process is to overcome the limitation of EIA in decision-making through forcing debate on environmental concerns at the beginning of the decision-making cycle. Use of the precautionary principle provides an approach by which to move away from always being reactive in planning, and to anticipate, perhaps prevent, the causes of environmental degradation (Mitchell 2002). Timing of the SEA application, in this regard, determines the nature and effectiveness of an SEA process. In Dalian's case, even when the role of the SEA application was mainly advisory, the process occurred too late to inform better decision-making. The SEA

process was conducted retroactively five years after the formal planning process was completed. The situation may be partly explained by the pilot and experimental nature of the case. But as was noted in Chapter Four, the Chinese environmental protection system, in general, has not been proactive and indeed has often responded to environmental problems when they have become evident and severe (Che *et al*. 2002). The failure with the China's EIA application at the project level also contributed to late involvement in the planning process and lack of opportunity for taking part in decision-making (Wang *et al.* 2003). According to an official from the DEPB, a great degree of difficulty existed with regard to early SEA application in the planning process. One reason was the relative low authority status of the environmental protection departments compared to other economically significant agencies and departments. The official further explained:

> Other sectors were mostly unwilling to introduce an SEA process in planning and decision-making because the interventions and open activities that SEA requires encroached on the "turf and territory" of other sectors. SEA, in their view, expanded the functioning domains of the environmental protection apparatus and affected the distribution of authority among sectors. Lastly, long-term primary concerns for economic growth and authority may place competing interests such as environmental issues in a disadvantageous position, which frustrates the effort of using SEA at the earliest possible stage of planning and decision-making. In short, other sectors had reservations about allowing the environmental issues to become part of decision-making (Informant #5, DEPB official, Dalian, September 2006).

The view was confirmed by the official from the Planning Bureau, who stressed in the interview that the role of SEA should not be overemphasized in the planning process, and the Environmental Protection Bureau remains as a consulting agent (Informant #2, DPB official, Dalian, August 2006). Notwithstanding the real difficulties of commencing the SEA process at the early stages of planning, it was hard to demonstrate how the

precautionary principle was used and moved toward proactively in planning and environmental management.

Given the uncertainty and complexity pertaining to sustainability, there is a need for a trial-and-error approach to the SEA process and development of a more resilient assessment system. The adaptive principle is appropriate when the assessment is conducted at the more strategic level of policies, plans and programs, where uncertainty is high. In Dalian's SEA case, when they were asked whether the process was an on-going, adaptive and responsive to changes, only 2.1 % of those surveyed believed that the process was adaptive. An unusually high proportion of the respondents (76.6 %) expressed an opposite view, and another 21.3 % gave an "Unknown" response (Table 5.8).

Practitioners' Perception of the Use of the Adaptive Principle in the SEA Process (%)

Question 8: Was the SEA process an on-going, adaptive and responsive to changes?

	Yes	**No**	**Unknown**	**N**
The adaptive principles	2.1	76.6	21.3	47

Table 5.8 Practitioners' Perception of the Use of the Adaptive Principle in the SEA Process

At interview, the official from the Dalian Development and Reform Commission suggested that the political risks of acknowledging the failures of the policies were forbiddingly high if the adaptive principle was used (Informant #3, DDRC official, Dalian, August 2006). As we know, the adaptive principle is most appropriate when anticipating that a policy may fail, and then the process can benefit from learning, adjustments and new understanding of the policy at stake. However, the official commented that the Chinese political system was not responsive to such failures. In the

bureaucratic hierarchy, the government units of lower rank must obey orders and rules issued by the superior units, the units of equal rank could not issue binding orders to each other. The system obviously was not designed to accept the changes and adjustments in the face of uncertainty. First, the top-down system guarantees the superior authority was not challenged in any respect. Decision-makers were not aware that they were experimenting and the policies were open admission that there may be no positive return. Furthermore, the system did not encourage capability and willingness to learn from errors. Second, the structure of the Chinese political system has tended to isolate government units at the same bureaucratic level from one another. Therefore, the costs of collecting the necessary information from which to learn and adjust were very high. In conclusion, the structural features of the Chinese political system have created a significant obstacle to use of the adaptive principle.

5.6. INTEGRATION: A LONG-TERM GOAL

The integration principle considers four forms of SEA and planning integration: substantive, procedural, institutional and policy. Dalian's SEA application was restricted in all above four forms. But the evidence also existed to indicate that attempts had been made to increase the effectiveness of environmental assessment in planning through integration. With regard to substantive integration, a proportion of three-quarters (75%) of respondents acknowledge the integration of biophysical issues with social and economic issues in Dalian's SEA process; approximately one-quarter of the respondents (22.5%) held the opposite view (Table 5.9). An examination of the written report indicated that the process was largely restricted to the economic and environmental issues

while the social concerns were pushed aside. The assessment result justified the city development policies and plans primarily based on the city's biophysical conditions and overall carrying capacity. The impact assessment was limited to the 10 elements of the environment, namely energy, water, land, coastal resources, surface water, air, noise, solid waste, sea area and ecosystem (SEA report, Dalian 2006, unreleased government document).

Practitioners' Acknowledgement of substantive Integration in the SEA Process (%)

Question 9: Did the SEA process address the ecological, economic and social concerns and their inter-relationship?

	Yes	No	Unknown	N
Substantive Integration	75	22.5	2.5	40

Table 5.9 Practitioners' Acknowledgement of Substantive Integration in the SEA Process

Speaking of procedural integration, Dalian's SEA process was conducted apart not only from the process of master plan-making, also from different levels of decision-making. Surprisingly, 32.6% of the respondents still thought that the SEA process was undertaken at the different stages of planning and influenced decision-making (Table 5.10). The discrepancy between the survey and the real practice could be explained by lack of communication and information exchange among the agencies. For instance, although the Development and Reform Commission, the policy-making department, was not directly involved in the SEA process, of 10 people surveyed in the Commission, eight believed that the SEA was part of the planning process. In contrast, the "Yes" proportion was very low in the other departments that took direct part in planning or assessment.

Practitioners' Acknowledgement of Procedural Integration of the SEA Process (%)

Question 10: Was the SEA process undertaken simultaneously with the planning process and did it affect planning at different levels of decision-making?				
	Yes	**No**	**Unknown**	**N**
Procedural Integration	32.6	58.1	9.3	43

Table 5.10 Practitioners' Acknowledgment of Procedural Integration of the SEA Process

There was a certain degree of coordination and cooperation among the relevant government agencies. The nominal leading agency was the Dalian municipal government. The Mayor and deputy Mayor were assigned the position of leaders of the task team of the Dalian SEA case; in fact, the Mayor's position as leader was automatic. One unique characteristic of the Chinese environmental management regime is the mayoral responsibility system, where the Mayor takes full nominal responsibility for the environmental performance of the city. It was, however, obvious that neither the Mayor nor the municipal policy-making department, the DDRC, was participating in the process. It was the DEPB that was in charge of the process, coordinating the activities among the affected departments. The institutional integration was restricted to the limited information exchange and intervention between the different departments was barely possible.

5.7. SUMMARY

In Chapter Five an analysis has been conducted to assess the sustainability elements of Dalian's SEA process, and we must conclude that the process did not fully consider the five sustainability criteria. The process was deficient in presenting some critical qualities of sustainability-based principles: the equity principle was the most

obviously missing element. The intra-generational equity issues were but briefly considered and no attention was paid to the inter-generational equity issue. The efficiency principle, on the other hand, was generally accepted and utilized in the process. But primary concern for economic growth limited full consideration of ecological efficiency. The participation principle carries the hopes for the future of China's environmental management, but to a large extent it is still an unfulfilled task. The Chinese bureaucratic system has created a significant obstacle to using the precautionary and adaptive principle. Lastly, the SEA integration was generally restricted to biophysical and economic issues, and failed to cover social concerns. Institutional cooperation was also limited. An in-depth analysis of institutional and policy integration will be presented in Chapter Six.

CHAPTER 6 ANALYSIS OF INTEGRATION OF SEA INTO PLANNING PROCESSES AT DALIAN

6.1. INTRODUCTION

Integrating the environment into policy-making and planning is the key criterion utilized in this research to assess any SEA's contribution to sustainability. As with most of China's environmental legislation, the SEA requirements contained in the new Chinese EIA law were a compromise. Nevertheless, they were a welcome Chinese commitment to a higher level of environmental assessment. They also signaled an interest in integrating the environmental concerns into the upper tiers of planning and programming. As noted in Chapter three, SEA may have considerable potential as an instrument for such integration. Countries worldwide, however, are encountering two major problems which hinder the integration of SEA and planning: "institutional unwillingness and methodological/technical inability" (Glasson and Gosling, 2001). The focus of this research is on the former with attention given to the particularities of Chinese institutional arrangements for SEA and planning as well as the Chinese institutions' strengths and limitations in facilitating SEA integration. An existing analytical framework, drawing on the work on the work of Mitchell and Pigram (1989) and Smith (1993), has been used to examine the degree to which SEA was integrated into the planning process in Dalian's SEA implementation of the city's master plan for the years between 2000 and 2020. Accordingly, this chapter is organized around six interrelated elements of the institutional analysis framework: legitimation, management functions, administrative structures, processes and mechanisms, and organizational culture and

participant attitudes. It primarily describes the data results from the interviews and the survey on institutional arrangements in the Dalian's SEA and the secondary data from the government documents and publications.

6.2. THE INSTITUTIONAL ANALYSIS OF THE DALIAN'S SEA

The Dalian EPB started to give serious attention to application of SEA in 2001 when the EPB in cooperation with several research institutions, conducted the preliminary SEA studies of the city's Master Plan between year 2000 and 2020. As it was the first experiment in applying environmental assessment to the upper planning stage, the EPB indicated that the application was not successfully integrated without a set of SEA guidelines and relevant institutional capacity (*Dalian EPB work report*, 2006, unreleased government document).

The official interviewed in the research suggested there were two impetuses behind the government's commitments to the application (Personal Communication, DEPB officials, Dalian, September 2006). The Dalian EPB, as with all other Chinese environmental protection apparatus, has been hampered by the problem of lack of authority and cooperation between government bureaucracies. The application of SEA may have potential for addressing the problems. First, SEA is applied to plans and programme formulated by most leading agencies that are responsible for economic development and trade. The application of SEA forces environmental issues into policy and decision making of those agencies. Therefore, the position of the EPB's authority among these agencies will be markedly enhanced. Secondly, SEA application requires greater co-ordination between the EPB and other government agencies and may

overcome the fragmented structural feature of the Chinese political system (Informant #5, DEPB official, Dalian, September 2006).

Dalian attempted to apply SEA into the master plans for industrial parks and development zones between 2001 and 2004. The first experimental period primarily was focused on the industrial development zone planning. Up until 2004, approximately 37 of 57 various industrial parks and functional areas, underwent the environmental assessment, at 58 percent compliance rate. Of these 37 industrial parks /areas, 5 were reported to have formulated environmental assessment statements. Other types of SEA applications were also identified in about 38 real estate planning and 4 agricultural progammes (*DEPB SEA work report*, 2006, unreleased government document). There was no doubt that all the SEA undertakings in the period were limited to planning projects or programmes of the specialized development zones or the administrative districts. The upper tiers of municipal plans and programmes, which define the critical social, economic and environmental relations of the city, had not been subject to the formal process of SEA. In addition, the SEA processes were deficient in identifying clear purpose, procedural guidelines, technical and financial support (*DEPB SEA work report*, 2006, unreleased government document). But this experimental stage provided some valuable insights and experience for wider SEA implementation and gave rise to the first plan level and municipal wide SEA case investigated in this research.

According to the government work report, there were three perceived benefits of implementing SEA in Dalian. First, the preventative feature of SEA regarding environmental protection was manifested and the practitioners acknowledged some

benefits of the SEA application. The SEA applications on the industrial and agriculture areas helped to partition various functional areas of the city and justify the employment of preventive measures of environmental protection. For instance, with the application of SEA on the new industrial zone programme at a Dalian's satellite city, Wafangdian, a total of 143 families were relocated from the new industrial development zone to ensure the sound safe space requirement between the residential and industrial areas. The SEA also resulted in the demolition of 13 heavily polluting boilers and the installation of centralized heating systems in the newly designated residential area at the city (*DEPB SEA work report*, 2006, unreleased government document).

To most practitioners, the more important implication of the SEA application might be the perceived reduction of the overwhelming workload and pressure of implementing the project level EIA in the new development areas. It was said that the formal EIA process was greatly simplified and streamlined for building projects in those specialized development areas which had undertaken an SEA (Informant #5, DEPB official, Dalian, September 2006). For instance, the pre-approval requirement from the relevant construction authority was abolished and the builders could entrust the qualified institutions to conduct an EIA directly. Similarly, the formulation of the EIA statement was also simplified in that the brief of the EIA statement was not required for a check and approval process, and instead the report and file approach was used. Thus, the time for approval of the EIA shortened from 60 days to 10 days. However, some studies regarding EIA applied to projects in China's development zone suggested that this "streamlining" was not well justified and has become a 'source of resistance to EIA requirements (Mao and Hill 2002, p.107).In competing for foreign investment in those development zones,

local governments tended to simplify EIA requirements, or even eliminate the EIA requirements. In this sense, there may be possible that SEA just provide an excuse for being less strict at the project level. In addition, it is not clear whether the SEA work cover all the issues that would have been addressed in the extra time at the project level. Consequently, this perceived benefit might be distorted in practice. Lastly, the planners and policy makers had used the SEA as a policy tool to ensure the validity and justification of all the development plans and programmes in those specialized areas *(DEPB SEA work report*, 2006, unreleased government document).

With the experience obtained from the first experimental period and the legal requirements for a formal SEA process in place, the EPB attempted a formal SEA process for the urban development master plan in 2006, and tended to use the case as the model for applying the SEA to the critical plans that have full municipal scope and significance. It is still too early to conclude that this first formal SEA attempt may determine the success of the future SEA application in the particular city of Dalian, or to a certain extent that of most Chinese cities in general. However, it certainly served as the pioneer case which explains the degree of SEA application in development planning and its integration with the planning process.

6.2.1. Legitimation: Inadequate Statutory Power and Vagueness of Legislation

China is applauded by the international community for its establishment of legal requirements for a formal SEA process applicable to various government plans and programmes (Dalal-Clayton and Sadler 2004). The particular concern in this inspiring context is whether a legal and enforceable platform has been built to ensure SEA

implementation. Such a legitimate platform, from an institutional arrangements perspective, consists of adequate SEA statutory power, a clear definition of agency's jurisdiction and responsibilities, relevant policy and program support, and sufficient financial resources.

As with all Chinese environmental laws, SEA implementation has lagged far behind the lawmaking. Almost five years after the emergence of SEA requirements in the new EIA law, SEA compliance has been very low at all levels of governmental departments and agencies with a few applications undertaken in some environmental proactive cities and areas. To name some examples, SEA for the planning of east coastal zone of Xiamen was undertaken in 1999, with support from the Canadian International Development Agency (CIDA); SEA for China automobile industry development policy appraised the policy and infrastructure requirements for Chinese urban and rural transportation demand up to 2010; SEA for "Air Pollution Prevention and Control Act of the People's Republic of China (APPCA) extended the SEA application to the legislative level (Che *et al*.2002). In the Dalian master plan case, officials were asked whether there were sufficient legal, policy conditions for SEA enforcement. Half of (50%) the respondents confirmed that the legal, policy and financial infrastructure in Dalian was strong and able to promote the SEA implementation while another half thought that the opposite was true. Interestingly, of the four departments under investigation, the two policy and plan-making departments, the Reform Commission and the Planning Bureau, thought that sufficient legal enforcement conditions were provided by the government to guarantee SEA implementation, with a high "Yes" rate of 88.9 % and 75.0 % respectively. The other two SEA enforcement departments, the EPB and the Design and

Research Institution, a very low of 22.2% and 35 % respondents gave credit to the government's SEA enforcement conditions (Table 6.1).

The four departments' perception of the SEA's legal enforcement conditions in Dalian
Question 11: Was there a legal and enforceable platform in Dalian by which it can be decided whether or not SEA is undertaken?

	Yes	No	Unknown	N
Dalian Development and Reform Commission (DDRC)	88.9	11.1	0	9
Dalian Planning Bureau (DPB)	75.0	25.0	0	8
Dalian Environmental Protection Bureau (DEPB)	22.2	77.8	0	9
Dalian Design and Research Institute (DDRIES)	35.0	65.0	0	20
Mean	50.0	50.0	0	47

Table 6.1 The Four Departments' Perception of the SEA's Legal Enforcement Conditions in Dalian

This discrepancy explains the dilemma that confronts Chinese lawmakers and enforcers: fast enactment of a law and gradual implementation. Zhang (2004) observed that some contemporary Chinese environmental laws and regulations borrowed the concepts and management tools directly from western countries without appropriate consideration of their applicability in the Chinese particular environment. One such example is the Air Pollution Prevention Law, which has yet to be put into enforcement since its enactment in 2000. SEA lawmaking and enforcement has the same problem. Of all 38 regulations contained in the new EIA law, 11 regulations relate to SEA and its application. Unfortunately, the regulations are largely impractical. There are omissions and ambiguity of provisions for key elements of the SEA procedure. These relate to the content of SEA written reports, timing and the nature of public participation, criteria adopted for the findings review, definition of duties and responsibilities of leading agencies, and the approach taken to use findings for publicly-accountable decision making (Wang *et al*.2003, Che *et al.*2002).

Ambiguity of law regulations at the central level is a key reason for slow and ineffective enforcement. An official stressed in an interview that the unclear and inadequacy of punishment measures compounds the problem and greatly weakens the statutory power of environmental laws (informant #5, DEPB officials, Dalian, September 2006). For instance, the EIA law states that department directors who fail to undertake a formal SEA process and submit the written report for approval in development planning should receive corresponding administrative punishment made by their supervisors. In practice, without provision for concrete punishment measures, such regulations lack sufficient binding force (the 2003 EIA law, Chapter Four, item 29, 30). The enforcement regime requires more stringent legal measures or underpinnings to ensure effective action against non-compliance. Another apparent problem with the ambiguity of the SEA legal regulations is the lack of a definition of leading and participating agencies and their respective duties and responsibilities. The EIA law has no explicit provision for agency jurisdictions and responsibilities regarding SEA applications. A particular problem is the omission of provision for the role of environmental authorities to ensure implementation. The functionally fragmented nature of the Chinese institutional system determines that the primary responsibility for environmental quality and concerns falls to the environmental protection apparatus itself. Consequently, the task of SEA enforcement was assumed to the environmental authorities at all levels. Without the relevant provision for their role or duties and responsibilities, the local environmental agencies either lack incentive or have pressures to implement SEA

Typically in this context, a number of legal procedural documents of detailed measures or guidance are to be issued by the local regulated community to facilitate legal implementation. In the case under investigation, the Dalian municipal government issued such a supplementary document titled ”Notice on Promoting Good SEA Applications at Dalian” in 2005, two years after the enactment of SEA requirements. To most environmental practitioners at Dalian, the Notice was the sign of initiating the city-wide SEA application and served as an important practical guidance. Such a document obviously lacks binding mechanisms and is viewed as an administrative order at most. But because it represents the local regulatory authorities' will and commitment, and is seen as a helpful indicator of local priorities, it attaches more local significance than national laws and regulations. But, an official in this study warned that such administrative documents add a degree of complexity to the Chinese environmental legal system and may further weaken the statutory power of environmental laws (Informant #3, DDRC officials, Dalian August 2006). Given the weak statutory power of SEA regulations, Mr. Pan, the head of the State Environmental Protection Administration (SEPA), called for the formulation of a new independent SEA law and adequate judicial independence for environmental authorities. The request, however, has received its critics from other ministerial agencies, which viewed it as an attempt to expand jurisdictions of environmental authorities (China Youth Daily, 2007). In conclusion, the relative efficacy between environmental laws and administrative orders may be difficult to determine at local level, where the local legal system is increasingly corresponding administrative measures or local interpretations to national laws and regulations. The SEA legal requirements contained in the EIA law play an uncertain and ambiguous role.

As far as the Dalian SEA case is concerned, although the survey results indicated that the majority of respondents (85.1 %) at Dalian believed that the Government stipulates the relevant agencies' jurisdiction and responsibility (Table 6.2). The evidence of such provision was not located in the government documents. For example, Dalian's SEA Notice was designed to clarify procedural requirements to ensure the SEA implementation at the city. The document states that planning departments and agencies should bear the responsibility of undertaking a SEA in planning, either by conducting the SEA themselves or by entrusting the job to a qualified research agency. There is no procedure laid out or provision for facilitating the participation of DEPB in the SEA process. Speaking of the case under investigation, the DPB was not even actively involved. It was the DEPB that started the SEA process and carried out the reviewing and approving process. An official interviewed mentioned that the implementation of SEA may generate the conflicts among agencies in relation to organizational structure and distribution of authority if the leading role was taken by the DEPB (Informant #2, DPB official, Dalian, August 2006).

The Practitioners' Perception of the Government's Definition of Agency Duties and Responsibility (%)

Question 12: Do you think that the SEA requirements in the EIA law explicitly define the SEA relevant agencies' duties and responsibilities?

	Yes	No	Unknown	N
Agency Jurisdictions and Responsibilities	85.1	10.6	4.3	47

Table 6.2 The Practitioners' Perception of the Government's Definition of Agency Duties and Responsibility

On the other hand, the ambiguity of the legal framework encourages greater autonomy on the part of local governments and more reliance on their ability to cope with environmental problems. As with implementing other environmental laws and regulations, the local EPB cannot be effective unless it secures the support from the local leaders and other agencies. The survey data suggested that in the case of Dalian SEA the respondents in general thought that the municipal government's commitment was high. About 88.3 % of those surveyed confirmed the sufficient political will of the municipal government in terms of its effort to encourage the use of SEA with city's policies, plans and programmes. Only 9.3 % officials surveyed thought that the government's commitment to the SEA application was not strong (Table 6.3).

The Practitioners' Perception on the Government's Commitment to the SEA at Dalian (%)

Question 13: Did the municipal government encourage the use of SEA with various government plans and programmes at Dalian?

	Yes	No	Unknown	N
The Municipal Government's Commitment	88.3	9.3	2.3	43

Table 6.3 The Practitioners' Perception on the Government's Commitment to the SEA at Dalian

An examination of the institutional status of the DEPB demonstrated clearly that the government's commitment may remain at the nominal level and the DEPB has not attained the formal authority necessary to enforce the SEA requirements. For example, the municipal government mainly undertook educational drives to promote the use of SEA among the agencies and departments. No stringent measures or rules were put in place to ensure the implementation. Also, the government did not provide the funds for conducting the SEA. An official from the DEPB suggested that when the formal authority for conducting the SEA was lacking they had to seek other means to attain ascribed

authority such as mass media or education, which occupied considerable time and resources. The official further indicated that the problem of nominal commitment and lack of formal authority existed at the national level too. The SEPA received considerable resistance from other ministries when the initiative of formulating an independent SEA law was brought forward to the People's Congress (Informant #5, DEPB official, Dalian, September 2006).

As noted in the previous section, the resistance to SEA application relates to two concerns. First, the aim of enhancing environmental protection through SEA may conflict with the dominant goal of economic growth held by particular agencies and ministries. Second, the SEA application may interfere with the decision making process of other agencies and therefore encroach on their firmly guarded "turf and territory". In the Chinese political system, formal authority status is significant in determining the distribution of power among government agencies and affecting policy enforcement as well. Agencies of equal rank cannot issue orders or intervene in the work of each other. With regard to the local environmental departments, rank and the scope of work are determined by their respective local governments. The cities that are environmentally proactive and have significant financial resources have tended to have more authority and ability to play a role or intervene in the decision making process. As such, authority and financial resources attained by the local EPB, in a great part, reflects the local leadership's perception of the importance of environmental protection.

In the case of the Dalian SEA, about 40 percent (40.4%) of those surveyed thought that the channel for interaction and communication between the DEPB and other

agencies existed while around 60 percent (57.4%) of them held the opposing view (Table 6.4). The data results might suggest that complexity of environmental problems have tended to involve activities of cooperation, co-ordination and communication among the agencies. From the perspective of formal authority however, such an intervention channel was not in place within the Dalian municipal government. A DEPB official indicated that some agencies have been cautious of the level of action and the expanded scope of the work ascribed to the DEPB through the SEA application (Informant #5, DEPB official, Dalian, September 2006). But as Ma and Ortolano (2000) have noted, although the local EPBs may be less able to count on other agencies at the same level for information and support, they have obtained informal means for taking action through the local People's Congresses and the media and individual citizens. The two informal intervention channels were identified at Dalian too. The local People's Congress has been an advocate of environment protection and formulated a number of environmental protection rules and regulations. The local citizens also have tended to register complaints about environmental problems to the relevant agencies. The two informal channels of intervention certainly affected the Dalian's environmental performance. However, Given SEA application has been new and rare at Dalian, the degree of such intervention through such two means has not been clearly demonstrated.

the Practitioners' Acknowledgement of the Intervention Channel between DEPB and Other Agencies at Dalian (%)

Question 14: Did the channel for intervention and communication between the EPB and other agencies exist?

	Yes	No	Not Sure	N
Rules of Intervention	40.4	57.4	2.1	47

Table 6.4 The Practitioners' Acknowledgement of the Intervention Channel between DEPB and Other Agencies at Dalian

With regard to the policies and programmes support for the SEA legal enforcement, an advantage generated from the top-down Chinese political system is a vertical tiered approached followed between levels of government in relation to policy/plan making. Such a tiered approach for policy making is particularly evident at the national level, where various national policies and plans are copied at both the provincial and local levels regarding time horizon, structure, and part of content. The well-known five-year national economic and social development plan is an excellent example that takes the form of vertical policy tiering. Meanwhile, most provinces and municipalities also formulated their local or provincial Agenda 21 documents that corresponded with the National Agenda 21 as a demonstration of the governments' commitment to pursuing sustainability. Generally, the local planners customarily have replicated the policies and plans established at the central level and rarely moved beyond the boundaries set by national laws (Ferris and Zhang 2005).

The vertical tiered approach to policies, plans and programmes seems to fit more comfortably with the paternalistic Chinese planning and political system than it does with Western democratic systems. In some respects, this Chinese system can be successful and efficient: it is easier to impose more rigorous requirements for environmental protection; and it may produce rapid implementation of programs associated with a specific problem (Palmer 2000; Fryxell and Lo 2001; McCleave *et al*. 2003). However, the system also has serious flaws, limiting the considerations of local circumstance and avoiding a genuine degree of public participation in environmental decision making.

With the enactment of SEA legal requirements at the national level, as with other cities Dalian issued the corresponding document regarding promoting the SEA application with a variety of municipal plans and programmes. But there were no other municipal policies and programme aids to ensure SEA implementation that would link departments horizontally in the planning and implementation process. The Dalian EPB had mainly counted on mass propaganda and education to achieve its goals. The project was carried out under pressure of the SEPA's designation of Dalian as a pilot city to test the efficacy of the SEA requirements. Except for this pilot project, there were no relevant SEA policies and programmes developed by the municipal government or other departments and agencies within the time frame of the research conducted. This was also indicated by the survey data (Table 6.5). Over 80 percent of the officials surveyed (80.8 %) either thought that the SEA implementation was not encouraged through incorporating it at various levels of PPPs (55.3 %) or they were not sure whether such a tiered approach existed (25.5 %).

The Practitioners' Identification of Policies and Programmes' Support for the SEA Implementation (%)

Question 15: Was the SEA implementation was tiered into the city development policies, plans and programmes?

	Yes	No	Not Sure	N
Policies and Programmes Support	19.1	55.3	25.5	47

Table 6.5 The Practitioners' Identification of Policies and Programmes' Support for the SEA Implementation

Financial control also influences whether or not the SEA requirements are enforced. As mentioned, the local environmental protection system is characterized by dual control by both superior agencies and local governments. The Dalian EPB reports

both to its immediate functional superior, the EPB of Liaoning province, and to the Dalian municipal government. Financially, it is the municipal government that holds the purse strings through providing the annual budget to the Dalian EPB. Clearly the local government commitment to the SEA application can be reflected by sufficiency of the funding allotted. In the Dalian SEA case of city development, the special project funding was provided by the government (*Dalian SEA work report*, 2006, unreleased government document). But neither the municipal government nor other functional departments and agencies has provided the funding for the SEA application. Furthermore, the official from the Dalian PB suggested that low compliance with the SEA requirements was largely due to the huge cost involved and the lack of the funding (Informant #5, DPB official, Dalian, September 2006).

6.2.2. Management Functions: Segmentation and Duality

The key characteristic of management functions of the Chinese environmental protection organizations is fragmentation. At the central level, the SEPA along with its affiliated monitoring stations and research institutions has assumed most of responsibilities related to environmental management of pollution control, natural resource conservation, product stewardship, and impact assessments. However, there were a host of economically important agencies including the Ministry of Agriculture, the Ministry of Urban Planning, and the Ministry of Foreign Affairs that have had jurisdiction and control over various aspects of environment protection (Jaheil 2000).

The situation of fragmented functions was partly lessened after the 1998 administrative reform which notably increased the bureaucratic rank of the SEPA and

reduced the number of agencies involved in environmental management. Hence, SEPA obtained a degree of functional integration by taking over important environmental roles from other ministries and enlarging its management domain to incorporate issues such as biodiversity, nuclear, safety, marine pollution within two miles form shore, and impact assessment for mining and so on (Jaheil 2000, Zusman and Turner 2005).

Nevertheless, the problem of fragmented function was not completely eliminated. First, some critical regulatory domains remain outside the purview of SEPA, including energy policy, watershed management, oceanic pollution and foreign affairs related to environmental problems induced by investment activities (Jahiel 2000). Furthermore, most recently because of the increased attention given by the central government and international communities to the environment, most agencies are now eager to take part in the environmental matters and viewing environmental protection as a new regulatory area and a source of international and national financial support (Frris and Zhang 2005).

The diffusion of environmental management functions has several negative implications. First, the agencies with an environmental agenda may not necessarily prioritize environmental interests beyond what is needed to receive national and international financial and other forms of support (Ferris Jr. and Zhang 2005). Secondly, the multiplicity of actors involved in environmental protection creates overlapping and inconsistent regulatory and management functions. Lastly, the fragmented authority on environmental protection hinders coordination and cooperation between agencies that SEA requires (Jahiel 2000). That is, the challenges of integrating SEA into planning are magnified by the fact that many functions of environmental protection and planning are

divided among the government agencies. The survey undertaken in this research revealed that an integrated model to SEA and the planning process was favored by 36.2 % of officials surveyed, while three other somewhat less integrative models were acknowledged by the remaining officials (Table 6.6).

The practitioner's identification of the links between SEA and the planning process at Dalian (%)

Question 16: How should SEA activities be carried out in the planning process?

Type of models[7]	Percentage	N
An Incremental Model	27.7	47
An Independent Model	10.6	
An Concurrent Model	25.5	
An Integrated Model	36.2	

Table 6.6 The Practitioners' Identification of the Linkage between SEA and Planning

An official from the Dalian Planning Bureau hinted that the reality is less convincing than the data revealed (Informant #2, DPB official, Dalian August 2006). The fragmentation of planning functions has resulted in two complicated planning systems: urban planning and social and economic planning. The domain of urban planning is limited to physical development planning such as land use planning and urban design. Social and economic planning is to generate comprehensive economic development plans. The division also existed among urban planners. Management staff usually works in isolation from design staff working with urban planning design institutes. The official stressed that integration may not only a matter of coordinating the fragmented management functions, or incorporating several separate several planning systems, or even amassing isolated

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[7] The four types relationships of the SEA process to the planning process used in the survey was based and revised from the Glasson and Golsing's work (2001) on the models of SEA and planning. An incremental process refers to the one that is part of the planning process but a single act at a specific stage of planning; the concurrent process is conducted at several stages of plan-making processes; an independent process is conducted separately from the planning process, usually after plan-making is accomplished; and an integrated process is where SEA becomes the tenet of planning process to the extent that its presence as a separate exercise disappear.

professionals. Given Chinese political context, it may evoke dismantling orthodox socialist institutions for planning. Presently, planning system reform has been gradual and slow compared to fast speed of economic reform (Wei, 2005).

The situation of fragmented authority and multiplicity of government units involved environmental protection is more complicated at the local level where devolution of authority to local governments has left the fertile ground for intervention to enforce strict environmental protection measures. Consequently, devolution has produced a patchwork of environmental performance across the nation (Jahiel 2000). As noted in Chapter Four, Dalian EPB's environmental performance has been noticeably remarkable among other Chinese cities. However it was largely due to the commitments from the Dalian municipal government. It has provided the annual budgetary funding to ensure the daily environmental duties accomplished. Furthermore, the municipality had granted sufficient funding for the various clean-up projects since early 90s, placed pressure on polluting enterprises to adopt more stringent control measures, and increased the EPB's authority to issue the deadline clean-up or shutting down order to egregious polluters.

But as authors like Palmer (2000) and Economy (2005) have noted, this relegation of the bulk of environmental protection to the local governments should not be read as simply an expression of improved efforts. Rather it can also be viewed as an institutional impediment that has threatened to undermine many of national environmental policies and programmes that cannot be or that are not being implemented effectively by local level authorities. The Dalian EPB official supported the view and indicated that despite some efforts that were made to promote SEA applications at Dalian after the SEA legal

requirements enacted in 2003, the first attempt of SEA implementation was not satisfactory because of insufficient support from the municipal government at the time (Informant #5, DEPB official, Dalian, September 2006).

The SEA application to the Dalian master plan attained the immediate attention among most of the government bureaucracy and signaled the beginning of the city wide SEA implementation. It was no doubt credited to the commitments made by the municipality, designating both mayor and vice mayor as the project leaders. Under the Chinese political context, their involvement indicated that the SEA implementation topped the list of the municipality's agenda. However, for other non-environmental agencies, a more important implication was that taking part in the SEA process might have the potential to enhance agency visibility and attain an advantage position in resource allocation from the municipal government. According to the *Dalian SEA work report* (2006, unreleased government document), the leaders from other 23 relevant municipal departments and agencies engaged in the Dalian's first SEA case to ensure coordination and cooperation required by a SEA process applied at the level of master plan of urban development.

Furthermore, the devolution of authority for environmental protection to the local governments has greatly undermined the SEPA's most important role for inspection and implementation conducted at the local level. The inspections from the central government are intended to monitor enforcement of environmental policy and signal high level of attention to local problems. However, researchers such as Economy (2005) has found that such inspection sweeps were not successful in addressing the essence of the problems,

which rests in the nature of the local political and economic situation and is beyond the reach of SEPA. In Dalian's case, SEPA pushed the SEA enforcement at Dalian by designating the city as a national test site and sending out an inspection group comprised of environmental experts. Of the officials surveyed, less than 60 per cent (56.8 %) believed that the dual system where the Dalian EPB is subject to two bureaucratic leaders was the key reason for Dalian's failure in SEA implementation. The opposite view was found among 38.6 % of officials surveyed (Table 6.7). The EPB official noted in the interview that the SEPA's effort was magnified at Dalian because of the backing attained from the municipal government. The dual system, in his words, might work well when goals and interests of the state and the local municipality were consistent. However, in the case of competing goals and interests, operational activities of environmental protection are susceptible to pressure from the local governments that have both the institutional and financial control over environmental agencies (Informant #5, DEPB official, Dalian, September 2006).

The practitioners' perception on the dual system's effect on SEA implementation at Dalian (%)

Question 17: Was the dual system of environmental protection (financial and administrative segmentation) the key reason for ineffective implementation of SEA at Dalian?

	Yes	No	Not Sure	N
The dual system of environmental protection	56.8	38.6	4.6	44

Table 6.7 The Practitioners' Perception on the Dual System of Environmental Protection

6.2.3. Administrative Structure: Inadequate Agency Mandate

With respect to the ideal management mode of SEA application at Dalian, the survey revealed a mixed perspective. Up to 55.5 percent of the respondents believed that

the SEA procedure should be either under the purview of the responsible plan-making agencies itself (28.9 %) or that of a central agency with an environmental mandate or that of the municipality (26.7 %). Less than half of the officials (44.4 %) thought that the environmental authority should assume the responsibility for SEA implementation (Table 6.8). In fact, the attempt to obtain a sufficient agency mandate to enforce SEA has been frustrated since the enactment of SEA in 2003. Despite the growing authority of environmental institutions over past decades, environmental laws and policies, at times remain weak and difficult to implement (Jahiel 2000).

Both SEPA and EPBs are nested in a matrix of authority relationships and bureaucratic hierarchy that are historically inclined to pro-growth beliefs. Thus the Chinese institutions have a propensity to produce weak environmental regulations and stymie their implementation (Zusman and Turner 2005). Meanwhile, the tight vertical lines of hierarchy have obstructed the horizontal coordination among government agencies at the same administrative level and resulted in competing government bureaucracies. More importantly, the effort to advance the formal environmental authority at the central level of government has not filtered down and translated to enhanced authority for local EPBs. Powerful local actors may place environmental interests low on the decision-making agenda and intervene against the enforcement of environmental policies. A Dalian EPB official commented that, at present, the bureau does not yet possess adequate agency mandate to enforce the SEA requirements among agencies that rest in within locale of Dalian. The advance in institutional building and backing from the municipality did not overcome the structural problem of inadequate

power for environmental protection (Informant #5, DEPB official, Dalian, September 2006).

The practitioners' identification of the appropriate administrative mode of SEA at Dalian (%)

Question 18: What do you think the most appropriate administrative mode of conducting SEA at Dalian?

Type of modes[8]	Percentage	N
Internal Mode	28.9	45
External Mode	44.4	
The Third Party	26.7	
Other Mode	0	

Table 6.8 The Practitioners' Identification of the Administrative Mode for SEA at Dalian

Exigencies of decision making are another distinguishing feature of Chinese bureaucratic institutions. At times, the centralized decision making model in China can be responsive and fast to react to emerging problems in development planning(McCleave *et al*. 2003).For example, the SEA requirements were enshrined in national legislation and many government regulations despite little knowledge of and the very limited experience with it. The rulemaking process was also rushed. Exigencies of decision making always goes with the absence of public consultation and lack of transparency in the decision making process, which have given rise to questions over accountability and credibility of decision matters (Wang and Liu 1998; Panayotou 1998).As matter of fact, fast release of a series of new environmental laws and regulations, according to Palmer (2000, p. 83), can be interpreted as:

> '…an attempt to limit the political role of environmental activities and to avoid a genuine degree of pubic participation in environmental decision making.'

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[8]In this research, the internal mode is where SEA procedure is administered by the responsible plan-making agencies; the external mode accords the management responsibility of a SEA process to environmental agencies at all levels; and the third party mode can either refer to the administration process by a central agency with an environmental mandate or the local municipalities.

The official from the Dalian EPB also stressed that not only the public was excluded from the decision making, but also assistance from other government actors was not greatly desired, particularly in terms of decision making (Informant #5, DEPB official, Dalian, September 2006). The key purpose of SEA is to provide information for better understanding of the issues at stake, resulting in better decision making. This benefit, however, was not acknowledged in the Dalian's case. Only slightly less than one fifth (19.5 %) of officials surveyed believed that the SEA process helped with improved decision making in planning. Up to 80.5 percent of respondents had doubt on the role of SEA in decision making in the Chinese authoritarian political context (Table 6.9).

The practitioners' perception of influence of SEA process on decision making at Dalian (%)
Question 19: Did the Dalian's SEA process influence the decisions made in the Dalian master plan (2000-2020)?

	Yes	No	Not Sure	N
The SEA influence on decision-making	19.5	78.3	2.2	46

Table 6.9 The Practitioners' Perception of Role of SEA in Decision Making

Of five officials interviewed, three suggested that the growing environmental awareness and the keen interests in environmental protection among the Dalian's government bureaucrats did not translate readily to pro-environmental decision making (Informant # 3 DDRC official, Informant 4, DDRC official, and Informant #5, DEPB official, Dalian, August and September, 2006).With respect to the decision rules of the local government, Edmonds (1994, p.228) has noted that:

> decisions are not always made by the top leaders of the country, but can come from the various levels of the central bureaucracy and can be modified or halted through bargaining between the center and the provincial or lower level authorities or between various agencies or committees. …Even the major decisions are announced, policy may still not have been fully formulated and changes continually occur.

Therefore, despite the enormous progress made in recent years to enhance the environmental regulatory and management regime, the local governments continues to have been afforded flexibility to facilitate local development interests, and most municipalities have been willing to trade off social and environmental costs against economic growth (Skinner *et al*. 2003).To compound the problem, it is difficult to draw a clean line between environmental regulation and social control in the political Chinese context. That is, the so-called "informal relationship" still plays its unique role in Chinese bureaucracies.

6.2.4. Process and Mechanism: Entrenched Informal Relationships

The Chinese environmental bureaucratic system uses a typical authoritative top-down approach where law and informal rules mingle and the influence of the local leadership has been intense. Although in some respects a top-down authoritative system may make it easier to facilitate rigorous measures and higher standards of environmental protection than western democratic systems, the contemporary Chinese environmental system, in fact, did not work effectively to safeguard environmental welfare. About two thirds of the officials surveyed (73.9 %) believed that the paternalistic Chinese style of environmental management inhibited the promotion of SEA application at Dalian (Table 6.10). Of the many problems underscored previously, one critical, widely debated issue may be the role of the informal rules among government organization and their mediating influence on environmental policy making and implementation.

The practitioners' perception of the effectiveness of top-down system in conducting SEA(%)

Question20: Was the top-down political system effective in implementing SEA?

	Yes	No	Not Sure	N
The Top-down Political Process	26.1	73.9	0	46

Table 6.10 The Practitioners' Perception of the Effectiveness of Top-down System at Dalian

At present, there is no coordination body charged with facilitating bargaining, negotiation, and meditation among the government bureaucracies. This screening vacuum has given rise to the existence of informal rules. However, these informal rules between organizations and their role in the political system is a key aspect in Chinese cultural context. The rules reflect a cultural predisposition to harmony and consensus building among key actors. Therefore, they may play an important role in determining how environmental policies and laws are carried out, particularly at the local level. (Hills and Man 1998). Of 47 officials surveyed, about 70 percent (70.2 %) of them acknowledged that informal rules of coordination were working among the Dalian's government departments and agencies. Less than 30 percent respondents either denied (25.5 %) or were not sure (4.3%) the existence of informal rules (Table 6.11).

The practitioners' acknowledgement of the informal mechanism for coordination at Dalian (%)

Question21: Was there an informal coordination system among the government departments and agencies?

	Yes	No	Not Sure	N
Informal Mechanism for Coordination	70.2	25.5	4.3	47

Table 6.11 The Practitioners' Acknowledgement of the Informal Mechanism for Coordination at Dalian

However, the divide between formal and informal rules is a critical feature of Chinese society. Formal rules are the "pollution-control" requirements detailed in laws and regulations, while informal rules are derived from customs and unwritten codes of conduct that affect how environmental laws are implemented (Ma and Ortolano 2000). Many factors have shaped the way these informal rules work and influence environmental protection. One obvious condition for the presence of the informal rules in Chinese authoritative political system is that no critical or clear distinction has been made between law and policy. Environmental policy can either be supported by a formal legal process, or be launched by the local governments, or even senior officials. Consequently, individual officials and political authorities at times override law and regulations (Sinkule and Ortolano 1995; Hill and Man 1998; Mao and Hills 2002).

In this regard, Dalian is a positive example by virtue of the strong local leadership that it is environmentally proactive (Economy 2005; Ma and Ortolano 2000). As with other cities of similar size and environmental resources, Dalian has not been an exception to the commonly recognized structural obstacles such as insufficient legal power, institution fragmentation and competing environmental bureaucracies. But blessed with mayors who have adopted "a green city" vision, Dalian has been credited for improved environmental performance as well as better enforcement of environmental law. The officials interviewed confirmed that environmental law may still play an uncertain and mixed role in Dalian's environmental protection. But the influence of the government was clear and evident with respect to progress towards the "greenest city" in China. That was also the reason why Dalian was selected as one of the "test cities" for the application

of SEA by SEPA (Informant #2 DPB official, Informant #4, DDRC official, and Informant #5, DEPB official, Dalian, August and September 2006).

Greater government support for environmental protection in Dalian was also evident in the survey conducted by researchers Skinner et al (2003), who compared the environmental enforcement style among Guangzhou, Chengdu and Dalian. They found that in Dalian the influence of the government was greater than that of public support. Unfortunately, Dalian's case of the strong, positive influence of the government was not typical and common in the rest of China. The discretion and flexibility gained by local governments through decentralization have also thwarted central government efforts to manage the environmental through law. Informal rules and local interests have too often intruded the proper functioning of environmental law and regulatory regime. Generally speaking, the traditionally powerful authorities such as industrial or energy departments have founded themselves in superior position in bargaining and negotiating for preferable conditions.

Of the many factors involved in defining the informal rules among the government organizations, one concept in particular, Guanxi, was and still is exercising a degree of mediating influence on the implementation process. The term "Guanxi" can be simply interpreted as the social connections or relationships that are established upon many shared background and experiences among individuals (Skinner *et al* 2003). Guanxi has its cultural roots in Chinese ideology of building harmony and avoiding conflicts between individuals and organizations. The thrust of the concept is to seek solutions acceptable to both sides through informal negotiating and bargaining.

Early studies by authors such as Lampton (1987) have suggested that in terms of policy implementation, Guanxi might have dual effects. In one hand, it might assist in policy implementation when senior officials are motivated and involved. On the other hand, it has undermined many of positive environmental policies from effective delivery. Guanxi can distort the proper functioning of environmental policy making and implementation system in China (Skinner *et al*. 2003).

In this study, Guanxi has not been clearly evident in Dalian SEA process. Dalian EPB's activities of applying SEA into the city's master plan were generally backed up by the agencies involved. The official in the Planning Bureau had some reservations on incorporating greater emphasis on environmental considerations in planning and indicated with caution that SEA should not lead to greater authority endorsed to the Dalian EPB. But given the application mobilized by mayor, the official indicated that the Planning Bureau facilitated the process by providing Dalian EPB easy access to the master plan and consulting service when needed. It may suggest that the willingness to carrying out the SEA application largely did not stem from commitment to legal compliance but rather from subjugation to superior authority. The mediating role of Guanxi and deference to administrative superiors are two facets of broader organizational culture that are very entrenched in bureaucratic policy making and implementation. There are, however, some other organizational cultures and attitudes that are exercising an influence on environmental policy making.

6.2.5. Culture and Attitude: Technocrats and Reserved Authority for Environmental Decision-Making

In general, the Chinese bureaucracy's attitude towards the environment can be broken down to three periods of political leadership. Mao's ideology towards the environment was that of something to be conquered, and the Deng Xiaoping-era was characterized by reckless economic growth at all costs, including undermining the environment. Under the contemporary Hu's leadership, most bureaucrats believe that environmental protection and economic growth are not mutually exclusive (Edmonds 2000, Seymour 2005). Over two thirds of respondents (76.1 %) indicated that the goals of two agendas are not contradictory (Table 6.12). However, given that the dominant goal of economic growth remains unchanged under the new leadership, the result may not evidently suggest that a growing number of officials are more environmental proactive. Rather, as more technocrats have started taking important government positions, it may mean that the government has turned to technological solutions to its environmental problems, and economic development ultimately could contribute to improved technology and science. A number of researchers have found that the cities that are economically advanced and open to the international community in general have a higher level of environmental performance and institution building than the inland underdeveloped cities (Economy 2005; Shin 2004; Ma and Ortolano 2004).

The Practitioners' Attitudes towards Environmental Protection and Economic Growth (%)
Question 22 : Do you think that the goals of economic growth and environmental protection are mutually exclusive?

	Yes	No	Not Sure	N
Environmental protection and economic growth are mutually exclusive	19.6	76.1	4.3	46

Table 6.12 The Practitioners' Attitude towards Environmental Protection and Economic Growth.

The emphasis on technological solutions was evident in the case under investigation. The Dalian SEA process was devoted the majority of its resources to applying the technological procedures and formulating the SEA report. Approaches dealing with evaluation or management, institutional arrangements and policy support were not addressed. Furthermore, the purpose of the application certainly strayed away from supporting for better policy making given the city's master plan had been approved and been in effect for five years when the SEA process to it was applied. Therefore, the Dalian SEA application was targeted at setting the technological sample for conducting future SEA processes. The involvement of Tsinghua University, a leading university of technology and science, was also evidence of the technocratic nature of the application.

Another bureaucratic attitude prevailing in contemporary Chinese society is the reservation towards greater authority ascribed to environmental agencies. Jahiel (2000) has suggested that the history of development of Chinese environmental protection can be seen as a process of obtaining the ascribed authority necessary to implement environmental measures. Although SEPA has been promoted to the ministerial level under direct leadership of the State Council, environmental authorities at all levels still find themselves in a difficult position to force environmental concerns in decision making. It was evident in the survey that asked questions about the role of the Dalian EPB in the SEA process. Both the municipal policy making agency, DDRC, and the planning agency, DPB, maintained that the Dalian EPB should merely advise development planning, with a percent of 33.1 and 75.0 respectively. Although 77.7 percent of respondents from the Dalian EPB believed that they should be part of group for decision making in term of SEA application, none of respondents from the DPB and

only 11.1 percent of respondents from DDRC supported the Dalian EPB's claim (Table 6.13). In addition, the attempt for enacting an independent law for SEA application has been blocked for years at the central government. Clearly, the survey result indicated that there was unanimous agreement among other agencies about the growing authority for the environmental agencies in implementing SEA at Dalian. The respondents felt that role of EPB should be not be enlarged in the SEA process and only serve as a consultant or a facilitator. This suggests that it will require tremendous efforts for EPBs to obtain the authority necessary to force environmental issues on to the decision-making agendas.

The practitioners' attitude towards the role of Dalian EPB in the SEA process
Question 23: What role do you think that the Dalian EPB should play in the SEA process?

	Evaluator	Facilitator	Consultant	Decision maker	N
Dalian Development and Reform Commission (DDRC)	33.3	22.2	33.1	11.1	9
Dalian Planning Bureau (DPB)	12.5	12.5	75.0	0	8
Dalian Environmental Protection Bureau (DEPB)	0	22.2	0	77.7	9
Dalian Design and Research Institute of Environmental Science (DDRIES)	36.8	5.3	5.3	52.6	19

Table 6.13 The Practitioners' Attitude towards the Role of DEPB in the SEA Process

6.3. DISCUSSION AND SUMMARY

This chapter has discussed the degree to which the institutional arrangements for environmental assessment and planning have acted as a constraint on the integrated approach to SEA applications. Based on Smith's framework in Figure 3.2, the author concluded that the overall conditions for an integrated approach to SEA applications were not favourable. Environmental and planning institutions at Dalian are suffering from

problems such as unclear objectives, insufficient political will, bureaucratic prerogative, compartmentalization and lack of provision for duties and responsibilities (Table 6.14).

The practitioners' perception of the institutional barrier of the SEA application at Dalian (%)

Question 24: what are the main institutional barriers for the application of SEA at Dalian?

Institutional Barriers [9]	**Percentage**	**N**
Lack of clear objective	58.7	46
Lack of Incentive	52.1	
Lack of political will	47.8	
Bureaucratic Prerogative	45.7	
Compartmentalized Organizational Structure	45.7	
Exigencies of decision-making	30.4	
Lack of provision of duties and responsibilities	21.8	

Table 6.14 The Practitioners' Identification of Institutional Barriers

Although there were indications that some efforts were made to enforce SEA application through law, the legal system of environmental protection as a whole was insufficient with respect to safeguarding SEA applications. Essentially the SEA law, as with the body of environmental protection legislation, was administrative rather than legal in nature, with no clearer parameters of liability being established and consequently local interests easily intruded into the regulatory regime. Politically, the reality of the government's willingness to commit itself into SEA application was less convincing than the survey data indicated. Although approximately 90 per cent (88.3 %) of respondents recognized the government's commitment to SEA implementation, there were indications that such a claim was more rhetorical than substantial. There was no provision on rules for intervention both at the national and local level. The paternalistic system placed too

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[9] Source: Sadler (1996)

much emphasis on the top-down policy and programme consistency and no real consideration was given to the local circumstances in policy and plan making.

Bureaucratic functional fragmentation was particularly notable among government units concerning the environmental issues. The number of departments and agencies assuming environmental responsibilities was growing, which necessarily has resulted in intense competition for environmental authority and resources. Because of the multi-layered, vertical political system, the environmental agencies are often unable to impose binding environmental requirements on the agencies at an equal rank, and therefore are in a disadvantaged position when conflicts arise between the environmental interests and economic development. The system also tends to respond to the emerging serious or more visible consequences of development. Compounded by the problem of exclusion of the public in planning, decision making was rapid and, lacked consideration of options, long-term impacts and accountability. Meanwhile, the bureaucratic process was often affected by informal rules and the role of law was uncertain and marginal at times. The problem was at its worst at the local level. The increased reliance the local government to address the environmental issues has led to the variation of performance concerning the local environmental protection. Last but not least, the bureaucratic culture and attitude did not facilitate the integration of environmental issues into planning and decision making. It was technocratically-driven and there was a general reluctance to give greater authority to environmental bureaucracies.

In response, the practitioners indicated a series of improvements needed to reform the Chinese environmental and planning institutions (Table 6.15). Most officials surveyed

believed that strengthened SEA requirements, better decision making and early application of SEA could benefit the integration of SEA and planning. The use of integrated sustainability-based principle of SEA, however, was not recognized by the majority, accounting for less than two fifth (35.6 %).

The Practitioners' Identification of improvements needed for better integration of SEA and planning (%)

Question 25: What improvements do you think are imperatively needed in the Dalian's context to facilitate the integration of SEA with planning?

	Per cent	**N**
Strengthening SEA legal requirements	73.3	**45**
Increasing transparency of decision making	71.1	
Early SEA application in the planning process	64.4	
Enhancing SEA training and education	55.6	
Reforming the planning system	51.5	
Simplifying the SEA procedures	47.7	
Establishment of a set of sustainability principles	35.6	

Table 6.15 The Practitioner's Identification of Improvements Needed For Integration of SEA with Planning

The presentation of research findings in Chapter Five and Chapter Six clearly produced some useful recommendations for Chinese bureaucracies with respect to development of guiding principles for SEA and reforming institutional arrangements in China's transitional context. Meanwhile, a case of China and its application of SEA enriched the empirical studies and led to some academic contributions. The last chapter, Chapter Seven, summaries these findings and highlights both practical and academic implications.

CHAPTER 7 CONCLUSION AND FUTURE DIRECTION

7.1. INTRODUCTION

A substantial body of literature examines how the application of SEA can facilitate consideration of environmental issues as well as sustainability, in particular, during development planning in the Western democratic context. This study makes an initial effort to consider how SEA is being introduced in a transitional socialist China and explores the principles and institutional conditions for using SEA as a tool for progress towards sustainability. China's approach to the ever-deteriorating environmental situation is described as "pollute now, clean up later", a practice commonly found in Western countries in the1970s and 1980s (Cann *et al.* 2005).

Recently the new Chinese leadership has been responsive to the international call for increased effort to correct severe environmental degradation and has embraced Western views of and solutions to environmental problems. It has also brought forward a new ideology of "building a harmonious society", a shift from the Deng-era goal, of reckless economic growth at all costs, towards building a balanced relationship among social, economic and environmental concerns. Economy (2005) has summarized China's strategy for environmental protection as having "three legs": surveillance by the central government, being subject to the watchdog role of the broad domestic and international communities, and being in line with environmental policy-making and enforcement at the local level.

This study focuses on the third leg, that is, local conditions for SEA enforcement. It set the background of an understanding of Chinese implications of sustainability at the central level from an historical perspective, and devolved the analysis on the SEA application principles and conditions for promoting sustainability to the local municipality, the city of Dalian. In summary, the study has sought answers to two questions: what principles should be pursued in a SEA process geared towards sustainability? and how can the application be embedded institutionally with the planning framework at the local level? This chapter sums up and highlights the implications of the study.

7.2. SUMMARY OF THESIS

A multiplicity of factors within and outside the ever-changing Chinese environmental protection regime has helped to give rise to the enactment of legal requirements for SEA undertakings with various governmental plans and programs from central to local levels. Although SEA has not attained independent legal status and was presented only as one chapter in the 2003 Chinese EIA law, it was generally applauded as a real step forward to taking environmental issues into Chinese policy-making and thus promoting progress towards sustainability goals. Following the enactment of the SEA law, both theoretical exploration and empirical experiments on SEA applications have been gradually but steadily taking place among Chinese researchers and practitioners. This study focuses on the applied principles and institutional conditions for its use as a tool for achieving sustainability goals in Chinese cities.

This study was conducted in a context where sustainability has moved beyond fiery political rhetoric towards practical application both in developed and developing countries. Of all the tools promoting sustainability-based applications, SEA has emerged as the most promising one and thus attained a great degree of importance in countries such as the EU countries, US, and Canada. Studies on and experiences with SEA undertakings in those countries have confirmed certain noticeable benefits of SEA in terms of facilitating progress towards sustainability. Some potential benefits are an improved information base for policy-making, streamlined EIAs at the project level, early public involvement, transparency in decision-making and integrative planning frameworks embedded with sustainability goals and principles. However, the debate on the necessary conditions for, and proper approaches to, the effective use of SEA in delivering those benefits has been persistent and unsettled.

A review of the substantial literature suggests three requisite conditions if SEA is to be a success. First, a truly new ideological shift towards sustainability is required, rather than a "business-as-usual" approach. Secondly, an integrative planning framework accommodating the full range of sustainability considerations is needed at the different stages of planning. Finally, a political and decision-making context is needed, where sustainability concerns are priorities on the agendas of government bureaucracies. Most importantly, it is widely recognized that the most effective forms of SEA are best studied in the specific contexts to which they are applied.

With these conditions in mind, this study was designed to consider their applicability in the Chinese urban context. The thesis started, therefore, by introducing

the background to, and significance of, the study, and outlining its key objectives. These included documentation of the evolution of environmental policy and sustainability in the post–1978 period of China and a description of the master planning and environmental assessment process in the urban areas. This background was then followed by an assessment of the sustainability-based principles for SEA application in China, and an analysis of the institutional arrangements for incorporating SEA with planning processes. Lastly, the implications for both theory and policy practice were produced, to facilitate the study and implementation of SEA by the Chinese.

Following the introductory chapter, the thesis explained the methodology utilized and the conceptual framework built from the literature review. Given the challenges of gaining access to information and the complexity of Chinese social and political circumstances, a primary case study design was adopted to ensure a multiplicity of data sources and the degree of flexibility needed for the context-specific research. The case selected was Dalian's first SEA undertaking as applied to the Master Plan for city development between 2000 and 2020, a joint "pilot project" promoted by the national environmental authority, SEPA, and the local government, the Dalian municipal government.

The choice of study site, which was such a specific case, was based on several reasons. First, the Dalian SEA case might be used by SEPA to test the efficacy of the SEA legal requirements before national guidelines for SEA application were developed. Also, the case might be set up as the model to follow within the government bureaucracies in Dalian, or even in other Chinese cities with similar development and

environmental challenges. Lastly, the city of Dalian is remarkable for its environmental protection and progress towards sustainability. The case study of the application of SEA in Dalian might generate new insights into, and useful discussion of, the Chinese style of a sustainable society.

In order to fully present the case of SEA in Dalian, data of various types were collected, including interviews, surveys, direct observation and secondary data. The interviews were conducted among the five leaders of the four government departments involved in the research, while the questionnaire survey took place among all the staff involved in Dalian's SEA process. Secondary data include governmental files and data and unreleased work reports and the final SEA report. The literature review in Chapter three served two purposes in this research: to develop a conceptual framework on which the research was built; and to enhance the validity of study when access to information was relatively restricted at the study site.

The literature review revealed that the link between SEA and sustainability originated from the emergence of SEA as "a proactive step towards attaining sustainability" in the late 1980s (Therivel *et al.* 1992:23). Since then, the effort to use SEA as a tool for progress towards sustainability has increased among researchers and practitioners world-wide (for example, Sadler 1999; Therivel and Partidário 1996; Sadler and Verheem; 1996, Shepherd and Ortolano 1996; Stinchcombe and Gibson 2000; Kørnøv and Thissen 2000; Sheate 2003). All such debates had necessarily centered on the hotly argued topic of conceptualization of sustainability. China's sustainability objectives, as stated in Agenda 21, mirror the widely-adopted "Triple Bottom Line"

approach to sustainability, which seeks ultimate harmony and balance among social, economic and environmental components (Cann *et al.* 2005). However, such a pillar-based approach has tended to increase the number of potentially competing interests and trigged a trade-off among the components (Gibson 2002). As an alternative, a number of authors have suggested the use of more general and overarching principles to stress the key changes or conditions needed in the pursuit of sustainability (Gardner 1989; George 1999, 2000; Sadler 1999; Hermans and Knipperberg 2006; Gibson 2002; Bellagio Principles 1996).

Based on the work of these authors, the study identified five key principles of sustainability applicable to SEA undertakings in China. An SEA process geared towards the ultimate goal of sustainability should be equitable, efficient, participative, precautionary and adaptive, and integrated. Of the five principles, integration is absolutely critical to the success of SEA implementation. No matter what the role of SEA is – advisory or authoritative, aimed at fostering better decision-making in conventionally focused planning, or at facilitating progress towards sustainability – the timing and forms of integration of SEA with the planning process define the extent to which SEA can play its role effectively. Integration of SEA with planning has five forms: substantive, methodological, procedural, institutional and political (Eggenberger and Partidário 2000). Of these, it is the institutional integration that determines the role of environmental assessment in planning and resource management (Smith 1993). Mitchell and Pigram (1989) have proposed the use of an institutional analysis framework to assess the 'leverage point' at which the opportunities for improving integration can be identified. Smith (1993) modified the framework and applied it to environmental assessment case

studies. This framework was adopted in this research to evaluate the institutional arrangements of Dalian's SEA application.

In addition to the theoretical exploration of SEA, the thesis has also drawn on a body of literature of empirical studies undertaken in different parts of the world, particularly Canada where environmental protection and SEA application appear to have a relatively high profile. The sustainability-based concepts of ecosystem planning, the eco-city, the healthy communities movements and "smart growth" are hotly debated and applied to development planning in many Canadian cities (Gibson *et al.* 1997; Roseland 1997; Newman 1997; Hancock 1997). Canada's SEA experience links applications with the government's sustainability strategies. According to the 1999 Cabinet Directive on SEA, each individual government department is responsible for applying SEA to its proposed PPPs and associating the assessment process with the department's sustainability strategy. In terms of the institutional arrangements, there is no authoritative administering body; however, the Commissioner for the Environment and Sustainable Development audits the government's effort to attain sustainability in SEA processes. In addition, the guiding principles of Canada's SEA also facilitate sustainability-based applications, which call for early application, examination of alternatives, and increasing accountability. As with other developing countries, China's environmental assessment system has been greatly influenced by international theories and practice such as the Canadian experience. It is certain, however, that adaptation and alteration are necessary when applying these international experiences to local social and political circumstances.

Chapter Four therefore looked at the particular context of the Chinese environmental protection system and the environmental assessment and planning practice at the city of Dalian. China's contemporary environmental protection era commenced along with the enforcement of its open-door reform policy in 1978. Over three decades of development, China has established a formal environmental management mechanism, which comprises a well-defined environmental legal system, extensive environmental bureaucracies, and changing behavior and management norms (Ferris and Zhang 2005; Economy 2005). In term of China's progress towards promoting sustainability, it has been in the first group of the countries that published the national statement for sustainability commitments, Agenda 21, and this sustainability strategy was incorporated in the national social and economic development plans.

The most notable advance, in the author's view, is the ideological shift among the new Chinese leadership from a dominant goal of economic growth to a balanced development perspective. Under the influence of the international community and domestic social and environmental pressure, the Chinese leaders have started to seek development solutions that are integrated and able to address a variety of social, economic, and environmental consequences incurred in a time of fast transformation. A series of concepts that were either learned from the West or were resuscitated from the traditional Chinese political heritage were recognized and stressed in the national development strategies. These include concepts such as environmental governance, circular economy, the *xiaokang* society, and scientific development perspectives.

What has emerged from this movement of ideological renovation is a new philosophical approach to development, centered on building a harmonious society, or in Kuhn's words, a Chinese model of democracy. A harmonious society seeks the appropriate and properly balanced relationship of all factors, and aims at coordinating economic growth, socialist democracy, and social equity and justice. While it is still too early to determine the extent to which the concept of a harmonious society would lead to a reinvention of Chinese society, it is clear that the concept is serving as the new guiding ideology, setting the keynote for Chinese social and economic development and promising encouragement for efforts to foster sustainability in the coming decades. However, Chinese sustainability has demonstrated some problems. First, the country's rich traditional cultural heritage regarding links between nature and human has not been fully appreciated in environmental management practice (Smil 2004). Secondly, the increased reliance on local government to address environmental issues has produced mixed results throughout the country, and undermined the implementation of some ambitious and promising environmental laws and policies (Jahiel 2000; Beach 2001). Thirdly, the environmental protection system in general is too often left to be managed at decision-makers' discretion rather than by legal means (Sinkule and Ortolano 1995; Hill and Man1998; Palmer 2000; Skinner *et al.* 2003). Lastly, a conservative attitude towards environmental protection has been persistent among government bureaucracies (Palmer 2000).

With regard to China's path towards sustainability, some characteristics are outstanding and worth noting. The growth-centered interpretation of progress – relying on the assumption that economic growth will eventually compensate for environmental

damage incurred during development – has had a long-term and destructive impact on the Chinese environment (Edmonds 2000). Because of the limited human and financial resources, end-of-pipe pollution treatments and controls, such as responses to water and solid waste pollution, have been the main task of China's environmental practitioners. Capacity building has been very limited in scope. Meanwhile, the limited public participation in environmental management has been widely criticized. Although awareness of the environment is on the rise among the Chinese public, ENGOs have been more or less invisible in terms of their number and size, and Chinese environmental policy has not responded to public concerns and calls for improvements. Instead, it is the public's own perception of the environment that is being shaped and influenced by the national policy or media (Cooper 2006). Finally, a process of professionalization in the government bureaucracies has changed the behaviors and management norms in environmental decision-making. However, the influence of these new emerging technocrats has been constrained because of their affiliation with bureaucrats in senior positions (Lin 1998). Above all, the difficulties of promoting sustainability in China have been primarily located at the local level, where the tendency is to ignore central policy and regulations in pursuit of local interests and economic welfare. This was discussed in the latter part of Chapter Four, which focused on environmental assessment and planning practice in the city of Dalian.

Although Dalian has been greatly applauded for its outstanding environmental performance in recent years, it is still subject to all the problems that have prevailed in China's environmental assessment and planning systems, given how embedded municipalities are in the broad paternalistic Party-state system. EIA implementation has

suffered from the vagueness of EIA regulations, local intervention and resistance from both government officials and industries (Wang *et al.* 2003; Chen *et al.* 1999; Mao and Hills 2002; Lo *et al.* 2003). With regard to the urban planning system, the planning process still bears the imprints of the traditional top-down socialist style, despite some changes which have occurred to cope with rapid economic growth and political transformation. Urban planning has been limited to physical planning, separating social and economic planning and avoiding public participation, and lacks the ability to deal with the changing socio-economic conditions (Xu and Ng 1998; Zhang 2002).

Nevertheless, compared to other Chinese cities, Dalian has demonstrated extraordinary determination with respect to improving the local environment. This is due largely to strong local leadership, which is committed to meeting environmental goals, has advanced economic development with sufficient financial funding for environmental protection, and has developed active connections with international environmental groups and communities (Economy 2005; Ma and Ortolano 2000). As such, Dalian was among the first group of test cities to undertake a formal SEA process related to its Master Plan for city development between 2000 and 2020, which was selected as a case study in this research.

Dalian's SEA as applied to the Master Plan was carried out five years later, after the plan had been completed and approved. Consequently, it served mainly as a demonstration project and did not help with decision- or policy-making in development planning. The nominal leading agent is the Dalian municipal government, a common practice for increased attention to a particular program or project at the local level.

Including the mayor and deputy mayor, about 23 government units were listed as participating agents, although, in practice, it was the Dalian EPB that was responsible for organizing, planning, and managing the SEA process. The Dalian Design and Research Institute of Environmental Science, an affiliated institute of Dalian EPB, along with Tsinghua University, completed the SEA technical evaluation process and formulated the SEA report. The critical policy-making unit, the Dalian Development and Reform Commission, and the plan-making unit, the Dalian Planning Bureau, participated in the stage of reviewing the SEA written report and providing feedback (DEPB *Work Report 2006*, unreleased government document). The revised written report was submitted to both the Dalian municipal government and the national environmental authority, SEPA, for final approval. The thesis then assessed the extent to which the Dalian SEA process used the critical sustainability principles, as well as the extent to which the institutional arrangements facilitated a process of integrating SEA application into planning.

It was evident that the Dalian SEA process might wear a modern countenance of sustainability concerns. For example, the guiding principles adopted in the assessment process stressed concepts such as fairness, integration, the circular economy and precautionary measures. However, this research has suggested that the practical process did not fully consider the critical sustainability criteria. The results have indicated that the issue of concern in promoting SEA as a tool for progress towards sustainability lies not in ideological acceptance, but rather in the understanding of its benefits and putting its principles into practice.

The equity principle was identified by most practitioners as significant and important. But to a large degree the practitioners' perception of the importance of the principles remained at the level of political rhetoric. In particular, consideration was not given to intra-generational equity. The officials interviewed suggested that consideration given to social concerns such as equity was politically challenging in the authoritarian context of China. As with EIA at the project level, the SEA process was inevitably technically-driven and tended to focus narrowly on the physical environmental impacts.

Efficiency was the most recognizable principle in the Dalian SEA process. Somehow, though, the principle was used largely to optimize economic benefits, and consideration of the holistic functioning of an ecosystem was avoided. One official interviewed suggested that from a production theory perspective, in the process of development it was necessary to trade off equity for efficiency (Informant #2, Personal Communication, DPB official, Dalian, August 2006).

The third proposed principle, public participation, remained mainly unfulfilled in the Dalian SEA case. Although three formal channels for public participation at Dalian were recognizable, the general public still played a very marginal role in the planning process. The general view held by the government officials towards public involvement in assessment was that it was nothing more than a technical requirement to complete a formal SEA process. The public has extremely limited access to the related planning and assessment information and documents, and their concerns about the environment have seldom been taken into account in the making of policies and plans. It was the priorities of the local officials that mattered (Lee 2005:56). The interviews conducted also

indicated that the concept of public participation lacked any cultural and historical background in the long imperial and authoritarian history of China. Resistance to involving the public in development planning was generated amongst some officials who thought that it was only a by-product of international development agencies and did not fit into the Chinese socialist political system (Informant #5, Personal Communication, DEPB official, Dalian, September 2006). From an ideological perspective, however, the new generation of China's leadership has started to stress the significance of developing a model of socialist democracy as opposed to that of Western democracy, and therefore increased transparency and public involvement in decision-making is receiving some attention. In practice, however, it was not difficult to conclude that neither the political system nor government bureaucracies have facilitated greater public involvement.

In addition, the control and command system posed challenges for applying the precautionary and adaptive principle in the SEA process, which was not only conducted too late to foster better decision-making, but also lacked the flexibility to cope with uncertainty and changes.

Last but not least, the integration principle was a long-term goal of the Chinese environmental assessment and planning system. Of five proposed forms of integration, institutional integration might be the most challenging task and could determine the success of the SEA process as an attempt at moving towards sustainability. Chapter six, therefore, analyzed this institutional integration process of SEA and planning in the city of Dalian.

SEA in Dalian was designated as a demonstration project by the national environmental authority, SEPA. It was also a work priority of the Dalian municipal government. Consequently, many government units and agencies were involved in the process and a great degree of coordination was necessary among institutional actors. Institutional analysis of Dalian's SEA process highlighted a number of problems.

Firstly, although China had been one of the first countries to publish legal requirements for SEA application, China's SEA law and regulations lacked adequate statutory power to enable compliance at the local level. One reason behind this might be the desire to avoid applying the SEA process at the critical policy-making level, which would necessitate full government engagement in cooperative and open activities. For most local bureaucracies, the exclusion of government policies from a SEA process might signal the limited commitment of the central government to the application and result in slow enforcement in those localities. In addition, the vagueness of legal regulations might contribute to the weak statutory power. There was no clarity about the duties and responsibilities of the leading and participating agencies involved in the SEA process, nor about the stringent measures for compliance. Thus, the enforcement regime had to depend on the interpretative authorities to clarify specific points of implementation. Meanwhile, in practice, the lack of provisions on the duties and responsibilities in respect of SEA thwarted the environmental authorities' efforts to promote and guide the SEA process. Other agencies, particularly those at the same bureaucratic level, generally had reservations about the leading role of environmental authorities in the SEA process. Perhaps they feared that this would further increase the environmental authorities' formal powers and intrude upon their own areas of control.

Secondly, China's environmental assessment and planning management functions was characterized by segmentation and duality. Environmental and planning duties and responsibilities are shared by multiple bureaucracies, which have created disharmony and overlap of regulations between the various agencies. At present, there is no coordinating body at the same level of authority to mediate these conflicts or address these problems of overlap. The problem of duality is the result of China's decentralization and empowerment policy, initiated in 1978. The policy is a double-edged sword – conferring the benefits of greater incentives, flexibility and discretion to respect the local circumstances, yet accompanied by local parochialism ignorance of national policies in pursuit of local interests, and a dual system of bureaucratic management. Increased authority for local government to assume full responsibility for local development has undermined many promising national policies and measures for implementing them, as well as the supervising and inspecting functions of the central agencies. As stated, increased dependence on local government to address environmental issues has been a constant structural barrier.

Thirdly, Dalian's SEA process also suffered from the problem of inadequate agencies and rushed decision-making. As with SEPA, the local EPBs are nested in a matrix of authority relationships that are historically inclined towards pro-growth views. As a result, the local EPB has rarely found itself in a position to attain the formal authority necessary to implement policies and regulations. Compared to other critical economic agencies, environmental authorities did not have a sufficiently strong agency mandate to ensure the implementation of SEA. This might explain the shelved proposal

to form an independent, specific SEA law at the central government level. Despite many official statements, environmental issues have not yet made their way into China's policy and decision-making. The growth in environmental laws and regulations that were borrowed more or less directly from the international communities without specificity for implementation is an example of such bureaucratic decision-making behaviors. Informal relationships have strong historical and cultural roots in China's bureaucracies. The thesis concluded that these traditional relationships still play a role in contemporary environmental and planning organizations. Partly, there was no overriding coordination organization to address agencies' conflicts and facilitate cooperation. More importantly, the distinction between policy and law was not clearly defined in the Chinese political context, leading to the situation where a government organization, or even a superior official, could exercise influence over the laws.

Lastly, China's bureaucracies were strongly influenced by the national culture and national views on economic growth and the environment, which have favored the use of technical solutions to China's environmental and planning problems as well as the "develop first and clean up later" attitude. Given the influence of such views, there is no doubt that it will require a huge effort for environmental authorities to attain the formal authority to implement SEA at both the central and local level. Reviewing the research results, the thesis generated several academic and practical implications.

7.3. IMPLICATIONS OF POLICY AND PRACTICE

This research has attempted to provide guidance for Chinese bureaucracies responsible for SEA application at the local level through specifying a set of

sustainability-based principles as well as the institutional conditions required for effective use of SEA as a tool geared towards sustainability. The findings of the research are of special use to the government units in the city of Dalian, particularly to the municipal government, environmental protection bureau, planning bureau and the agencies likely to be involved in SEA implementation in the coming years as SEA is encouraged as a normal practice applicable to various government plans and programs in the city. The research results may also be extended to other cities that share some similarities with Dalian, in their level both of economic development and of institutional capacity.

Specifically, the research carried out for this thesis has generated four policy and practice implications. First, the research suggested that use of general, explicit sustainability-based principles for SEA can assist in fostering the goal of sustainability. China's SEA requirements, contained in the EIA law, include overriding guidelines or principles to direct the practical application (Appendix 2, Box 2). It is suggested here that China's SEA implementation needs a set of explicit, context-adapted and culturally accepted principles for sustainability to guide its application in the country. Although many questions remain about the essential requirements for sustainability, it is proposed here that any effort towards sustainability in the Chinese political context ought to focus on equity, efficiency, public participation, the precautionary principle and integration. Development of such context-specific, sustainability-oriented principles requires understanding of China's interpretation of sustainability, and the particular political and social factors that have shaped contemporary China's environmental and planning policies.

For example, public participation is a vigorously contested principle in authoritarian China, and the reality is that the general public has played a marginal and uncertain role in development planning. However, the research has suggested too that as China endeavors to create its own model of socialist democracy in pursuit of building a harmonious society, more meaningful public involvement in development planning may be achievable in the near future. In the Chinese situation, despite the limitations of applying such a principle in a top-down socialist system, public participation should still be emphasized but a new approach, different from that of the West, is necessary to assert its significance. Setting up hotlines to SEA cases may be a practical approach for most Chinese cities.

In contrast, the integration principle seems promising in China's top-down party-state regime, as policy is strictly filtered down from the central to the local level. But since China is undergoing a period of dramatic transformation, it has both the old imprint of a planned command economy and the new features of a transitional economy. Structural problems such as organizational segmentation, largely stemming from the old political system are compounded by the emerging issues of devolution and decentralization at the local level. The integration principle may pose greater institutional challenges than policy, procedural or substantive ones. The research called for the most appropriate set of principles for SEA implementation in China to be sustainability-driven, context-specific and applicable in a practical way.

Principles/Criteria	Implications
Fairness	1) consider the social aspects of development and explore means and methods of conducting social impact assessment in SEA; 2) promote the understanding of concept of harmony among government officials; 3) balance the relative weight between inter-generational and intra-generational fairness considerations;
Efficiency	1) include an ecological efficiency perspective; 2) focus on the primary goals of sustainability; 3) adjust the existing planning and assessment system to SEA implementation;
Participation	1) enhance public participation through understanding of ideology of socialist democracy; 2) use education and training to increase the awareness of involvement of the public and interest groups; 3) provide the public with more accessible channels of participation such as the SEA hotlines; 4) make use of local knowledge system in conducting an SEA process;
Precaution and Adaptation	1) conduct SEA in planning process as early as possible; 2) use a trial-and-error approach to SEA application and promote adaptive planning; 3) promote the longer term, multi-stages SEA applications;
Integration	1) move SEA application upstream to policy level and form a tiered approach for policies, plans, prgrams, and projects; 2) include social and economic considerations in SEA; 3) promote coordination and open activities among the government units; 4) define the duties and responsibilities of agencies involved in SEA; and grant the environmental bodies sufficient authority within the agency's SEA mandate

Table 7.1 Implications for Building Sustainability-based Principles for SEA Implementation in China

Table 7.1 summarized the key implications derived from application of the five proposed principles in Dalian's SEA case, which reflected the main concerns of implementing SEA in the city. As discussed above, specification of these general criteria should recognize the particular social, political context within which it is applied. In the

case of SEA in Dalian, adoption of culturally accepted concepts such as “Fairness” and “Harmony” might be helpful to promote the equity principle. Efficiency principles should identify the key goals of sustainability of the city. Participation should not only be recognizable to the public through training and education program, but also establish more accessible channels for being involved in the development process. Precautionary and adaptation requires early application and a long-term and multi-stage of SEA application. Lastly, integration needs to extend SEA to the policy level, address broad concerns of social and economic issues, and increase cooperation and interaction between participating agencies. Importantly, to use the criteria discussed in table 7.1 in practice, there is a need to develop more detailed and case specific versions for particular application contexts.

A second implication for the Chinese bureaucracies is the need to increase the formal authority of the environmental institutions, particularly at the level of urban municipalities. The persistent effort to attain greater formal authority to enforce environmental laws and policies at the central level in the past four decades was not successfully passed down to local EPBs because of the intervention of local governments. The existing SEA requirements did not specify the duties and responsibilities of leading and participating agencies, nor the role of environmental institutions. Under the Chinese bureaucratic administrative system, when formal authority is lacking it is, if not impossible, very hard to enforce effectively any promising laws or measures such as the SEA requirements. Appropriate legislative provisions are needed to ensure that environmental institutions can obtain the authority necessary to implement SEA among

government units. For example, including provisions allowing the environmental authorities to require a SEA process to be undertaken by government units at the same administrative rank may allow the environmental institutions to play a leading role in SEA implementation. In addition, limiting environmental authorities to a consultative role would seem to weaken them rather than increase their power to require effective SEA work. A monitoring and enforcement system is desirable to increase the quality and compliance of SEA application within the Chinese bureaucracy.

A third policy implication of the research is the urgent necessity for the institutional reform of China's environmental assessment and planning system. The research revealed that China is increasingly faced with the problems stemming from a rapid growth economy and a transitional political and social system. But the old top-down authoritarian planning and environmental protection system has remained almost intact structurally and has become the major obstacle for promoting sustainability-based policies and applications. The Chinese government should enhance the legal framework for environmental protection and planning through specifying the legislative requirements, clarifying duties and responsibilities and setting up more stringent legal measures for non-compliance. In particular, it is suggested here that a stronger, more explicit and independent SEA law may contribute to higher compliance with SEA requirements and more consistent integration of SEA processes and findings at both national and local levels. Meanwhile, the government should further deepen institutional reform, intensifying the environmental responsibilities of the environmental institutions at all levels, and balancing the influence of local government on planning and environmental management activities. Other possible means of improving the

institutional capability to implement SEA in planning may include: setting up a coordinating agency to mediate conflicts between the government units; minimizing the role of informal relationships in policy implementation through enhancing law enforcement; and promoting an organizational culture that stresses capacity-building when addressing environmental and planning problems and a pro-environmental approach in development planning.

One final policy implication of the research relates to the need for the development of a culturally accepted Chinese concept of sustainability to assist the use of SEA as a tool for achieving the goal of sustainability. The ideology of building a harmonious society is an excellent example of use of local knowledge to increase the level of public identification with the national development policy. However, the concept of a harmonious society bears more political and social significance than environmental implications. Despite the links between the two concepts, particularly regarding relationships between economic growth on the one hand and the environment, social equity and justice, and public involvement, on the other, the culturally-friendly concept of the harmonious society – while it may assist in the understanding of the essence of sustainability – may not effectively entrench the environmental significance of that concept in planning processes. The most important thing, perhaps, is that it is crucial for Chinese bureaucracies, academic institutions and the general public to shift to a pro-environment approach to economic development.

SEPA had made some efforts to publish an independent SEA law or provide implementation guidelines in order to apply the existing requirements in Chinese cities.

Based on the study of the Dalian's SEA case, some tentative recommendations to this anticipated independent SEA law or guidance may be identified. First, it is necessary to clarify and extend the interpretation of "environmental" to include social and economic as well as ecological aspects. This would help to promote key elements of SEA integration. Secondly, as discussed above pubic participation is important despite the particularity of China's political circumstance. A practical approach would be to set up a SEA hotline or a mayor forum to ensure that the public has necessary access to address the SEA processes or related information. Thirdly, given the limited authority of environmental institutions, there is a need for central monitoring and enforcement of SEA requirements. Fourthly, clarification of duties and responsibilities of the leading and participation agencies in the SEA process would foster effective SEA implementation. Lastly, the central and local governments could provide economic or policy incentives to SEA implementation such as funding support or preferences for SEA programs.

7.4. IMPLICATIONS FOR THEORY

My research has also made contributions to current academic knowledge on the use of SEA as a tool for progress towards sustainability. More importantly, the empirical research results from an urban city in China have been shown to enhance particularly the studies on the applicability and pre-conditions of undertaking the SEA process in developing transitional countries: empirical studies on SEA application in China and developing countries are decidedly lacking (Dalal-Clayton and Sadler 2005). The limited Chinese literature has predominantly discussed the legal underpinnings of SEA, technical procedures for undertaking a formal SEA process, and SEA applications in land use

planning (Cai *et al.* 2005; Lai *et al.* 2003; Zhang 2006; Zhu and Ju 2003). The significance of SEA as a means for achieving sustainability goals was emphasized by the deputy minister of SEPA, Mr. Pan (2005) and authors such as Chen *et al*. (2005). But there are as yet no empirical studies devoted to the exploration of the conditions or principles for SEA applications in Chinese cities in pursuit of sustainability. In particular, no studies have examined the existing institutional arrangements for environmental assessment and the planning system, nor the effect which such arrangements have upon the implementation of SEA. In the context of these gaps, this research extends academic knowledge on the applicability, in a developing country like China, of SEA used for the purpose of promoting sustainability, and on the adaptations necessary to apply SEA in established political and institutional frameworks.

Despite skepticism in the literature regarding the suitability of promoting SEA in developing countries, the research demonstrated that SEA is beneficial in that consideration of it does increase government officials' environmental awareness, enhancing the image of environmental authorities, and to a lesser extent, improving the decision-making, policy-making and planning process in developing countries such as China.. Meanwhile, this research revealed that the SEA's role of promoting progress towards sustainability is magnified when explicit, sustainability-based, practical principles for SEA are adopted as overriding guidelines or criteria. It appears that China's experiments with SEA applications in some cities face tremendous technical, institutional and political challenges which are due to the old authoritarian planning and environmental protection system. The research findings suggested that many of common problems identified by the literature about the applicability of SEA to developing

countries could be found in Dalian. In particular, these include lack of transparency in EIA/SEA processes, lack of political will/commitment to SEA, lack of strong Environmental Ministry, lack of cooperation between governmental agencies and commitment to economic growth above everything else.

However, there are some findings which are atypical and particular to the Chinese setting. In Dalian's case, strong and early commitment to the rhetoric of sustainability from the central and local governments was evident. China certainly has a rich tradition of using propaganda and mass movements to implement governmental policies and measurements. The rhetoric of sustainability was successful given the widespread of formulation of Local Agenda 21 and sustainability strategies in various cities. Meanwhile, China has the ability to move quickly in implementing new environmental policies such as pioneering efforts to implement SEA. Local governments have obtained considerable discretion in changing or enforcing environmental and management-related legislation. The research also documented that China has developed the beginnings of an ideological and institutional groundwork for employing pro-environmental policies and measures at the city level. All these findings may pick up academic interest and debate about SEA in developing countries.

Some aspects of the SEA application in the case of Dalian's Master Plan were also related to sustainability principles. The research suggested that if SEA is to be an effective and normal practice for addressing sustainability concerns, at the central level principle-based guidelines should be useful in stressing the role of SEA in delivering sustainability. Furthermore, development of such principles may not only increase

acceptance of critical aspects of sustainability, but also lead to a reconsideration of local knowledge and culture. As the research results indicated, China is exploring the new ideology of building a harmonious society, which will certainly affect her environmental and planning policies. Therefore, the research enriches the literature on links between local knowledge and the concept of sustainability.

Another academic contribution of the research has been to enhance knowledge of the establishment of a planning framework and its role in conducting SEA. There is a growing literature which recognizes that institutional factors within such a framework do affect SEA applications and that changes are needed to overcome various institutional barriers and achieve a more integrated approach to SEA and planning (Glasson and Gosling 2001; Eggenberger and Partidário 2000). The research results revealed that a whole raft of "interrelated and mutually reinforcing" institutional barriers raised by Sadler and Verheem (1996) was generally found in China's environmental protection and planning system, although the problems of informal relationships among government units, the compartmentalized bureaucratic structure and the duality of management were more salient in Chinese environmental and planning bureaucracies. The research suggested that a drastically reforming approach to the existing planning and environmental protection system is not desirable in view of China's political circumstances. Promising means include, rather, making gradual changes to institutional arrangements, for example by setting up a coordinating agency with an environmental mandate to ensure the implementation of SEA, and clearly defined provisions on the duties and responsibilities of agencies involved in an SEA process.

Lastly, the research triggered a number of additional research questions that may further extend theoretical and empirical knowledge of the links between SEA and sustainability and the established institutional framework within which SEA rests. Consideration to implementing policy and programmes levels of SEA in China is very valuable for using SEA as a tool for promoting sustainability. The application of the programme level of SEA may relate to technical and management difficulties and limited SEA resources. The challenge for policy level of SEA, however, is primarily political. China's SEA requirements purposely exclude the provision of use of SEA at the policy level after several rounds of consultations among governmental agencies (Che *et al*. 2002). In the authoritative China, policy level of SEA was perceived as a dramatic challenge with respect to government secrecy and authority. Therefore, this highest level of political decision makers in China may have little chance to be subject to the application of SEA in the near future. Despite the fact that some attempts have been made to apply SEA to China's energy policy or industry development policy by several academic institutions (such as SEA for Shanxi Province's Coal and Electricity Strategy in 1997, and SEA of China Automobile Industry Policy), the efforts made no meaningful contribution to policy making in practice. As the interest about the application of SEA at policy level is growing in Chinese academic circles, it will be interesting to see how Chinese policy makers will response to this call.

There are some other possible questions for future consideration. Does the use of sustainability-based principles for SEA have the same effect on the implementation of SEA in developing countries and developed countries? How do the criteria for the

development of sustainability-based principles for SEA in China differ from those for developed countries? What is the appropriate form for an integrated approach to SEA and planning in a top-down system? Should SEA be focused narrowly on environmental concerns or more broadly on sustainability concerns? Are the barriers to SEA adoption and implementation really much different from those in the West, including Canada? How crucial might public participation be in overcoming the evident limitations of present practice? How to build the capacity needed for effective SEA adoption and implementation in China? Research on these questions can generate the most appropriate and effective form and management model for applying SEA in a developing country, and make it easier ultimately to achieve the goals of sustainability.

7.5. CONCLUSION

Any attempt to use SEA as a tool for sustainability must consider two critical questions: what does sustainability imply in the particular country or city context? and does the established institutional framework accommodate sustainability goals and the implementation of SEA in its planning processes (Sheate 2003; Baker and Fischer 2003)? Kørnøv and Thissen (2000) have stressed that SEA has twin roles in promoting sustainability: an advocatory role which can boost environmental awareness in development planning, together with an integrative role which offers a broad framework for integrating environmental concerns into planning. China's attempt to enforce the SEA applications with various governmental plans and programs has in the main been targeted at the former. Meanwhile, SEA is a necessary but not sufficient condition for achieving

sustainability. SEA and other policy instruments such as national sustainability strategies, land use planning and integrated resource management are closely linked and affect the potential for progress towards sustainability (Sadler and Verheem 1996).

China's framework for sustainability has undoubtedly built upon Western views and experience, but it has evolved over the years to accommodate the dramatic economic and social transformation of contemporary China. Nevertheless, such a framework, with its mixture of new laws and policies and an old bureaucratic structure, is problematic for the implementation of SEA. The reasons for this are complicated, as has been shown, but the authoritarian political system is critical in determining the success of SEA implementation. Reform of the existing environmental protection and planning system is required to increase the institutions' ability to address the challenges of sustainability at different tiers of the decision-making hierarchy. More importantly, the imperative task for SEA implementation in China is the development of sustainability-led and context-dependent principles for SEA.

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APPENDICES

APPENDIX 1 QUESTIONNAIRE AND INTERVIEW

Strategic Environmental Assessment and Sustainability in Chinese Cities

Strategic environmental assessment (SEA) is a process that aims at ensuring that environmental aspects and sustainable principles are addressed and incorporated in the decision making levels of policies, plans and programs. The 2003 Chinese environmental impact assessment (EIA) law requires SEA to be conducted for plans and programs of land use planning, regional development, watershed and sea area planning. This inclusion of SEA requirements complemented the project-oriented EIA process and marked a real step forward for sustainability assessment in Chinese cities. The research attempts to explore the role of SEA in promoting sustainability as well as the effective approach to SEA in urban development in China. The questionnaire below is design to collect the information on the practitioners' knowledge and attitude on SEA and sustainability in Dalian city which is selected as the site of the case study in this research.

Dalian Urban Development Master Plan was approved by the State People Congress in 2000 and became an official development guideline for year between 2000 and 2020 at Dalian city. The SEA application on this Master Plan was undertaken in 2006, involving primarily Dalian Environmental Protection Bureau (DEPB) and its affiliated research institution, Dalian Planning Bureau (DPB) and Dalian Development and Reform Commission (DDRC). The following survey questions are relevant to, though not exclusively limited to, this process. The questionnaire is to be conducted anonymously and the participants only need to provide the date and site of the survey conducted.

Date: _____
Site: _____

Note: The questionnaire has two parts and 25 questions: sustainability principles and Environmental Assessment at Dalian city; institutional arrangements of the planning and assessment process at Dalian. The questionnaire uses single choice and multiple choices where appropriate. The participants can also write supplement answers to the survey questions.

Thanks for your time and cooperation.

Part I. Sustainability Principles and Environmental Assessment at Dalian

1. Did the SEA process address the social equity?
1) Yes
2) No
3) Unknown

2. Was future generation's well-being considered in the SEA process?
1) Yes
2) No
3) Unknown

3. Did the SEA process in Dalian encourage reduction in absolute resource and energy use?
1) Yes
2) No
3) Unknown

4. What were efficiency problems in the Dalian's SEA process?
1) Lack of focus (e.g. the process included broad sustainability and development objectives, and lost the depth of considering environmental concerns)
2) The process was time consuming
3) Either the use of SEA or implementation of the SEA results was not facilitated by the existing system and caused extra cost
4) Others_____

5. Who were involved in the SEA process?
1) Decision makers
2) Environmental authorities
3) The general public
4) The planners
5) The experts on environmental issues
6) Non-government environmental organization (ENGOs)
7) The Marginalized groups affected
8) Other_____

6. What are the key problems for broad participation in Dalian's planning and assessment process?
1) Lack of effective channels
2) Lack of Communication
3) Inaccessibility to information
4) Lack of transparency and openness of decision-making
5) Other_____

7. Did the SEA consider the alternative of taking no action on the policy issues or prohibiting development in face of uncertainty and complexity?

1) Yes
2) No
3) Unknown

8. Was the SEA process an on-going, adaptive and responsive process to changes?
1) Yes
2) No
3) Unknown

9. Did the SEA process address the ecological, social and economic concerns and its interrelationship?
1) Yes
2) No
3) Unknown

10. Was the SEA undertaken simultaneously with the planning process to affect planning at different levels of decision-making?
1) Yes
2) No
3) Unknown

Part 2: Institutional Arrangements for the SEA

11. Was there a legal and enforceable platform at Dalian by which it can be decided whether or not SEA is undertaken?
1) Yes
2) No
3) Unknown

12. Do you think the SEA requirements in the EIA law explicitly define the SEA agencies' duties and responsibilities?
1) Yes
2) No
3) Unknown

13. Did the municipal government encourage use of SEA with various government plans and programmes at Dalian?
1) Yes
2) No
3) Unknown

14. Did the channel for intervention and communication between EPB and other agencies exist?
1）Yes
2）No

3) Unknown

15. Was the SEA implementation was tiered into the city development policies, plans and programmes?
1) Yes
2) No
3) Unknown

16. How should SEA activities be carried out in the planning process?
1) Internal evaluation mode (the responsible planning agencies)
2) External evaluation mode (relevant environmental agencies)
3) The third party (the local municipalities)
4) Other mode _____

17. Was dual system of environmental management (e.g. financial and administrative segmentation) the key reasons for ineffective implementation of SEA at Dalian?
1) No
2) Yes
3) Unknown

18. What do you think the most appropriate mode of conducting SEA at Dalian?
1) Internal mode
2) External mode
3) The third party
4) Other mode

19. Did the Dalian's SEA process influence the decisions made in the Master Plan (2000-2020)?
1) Yes
2) No
3) Unknow

20. Was the top-down political system effective in implementing SEA?
1) Yes
2) No
3) Unknown

21. Was there an informal coordination system among the government departments and agencies?
1) Yes
2) No
3) Unknown

22. Do you think that the goal of economic growth and environmental protection are mutually exclusive?

1) Yes
2) No
3) Unknown

23. What role do you think that the Dalian EPB should play in the SEA process?
1) Evaluator
2) Facilitator
3) Consultant
4) Decision makers

24. What are the main institutional barriers for the application of SEA at Dalian?
1) Insufficient political will
2) Lack of clear objectives
3) Lack of provision of duties and responsibilities
4) Compartmentalized organizational structures
5) Exigencies of decision-making
6) Lack of incentive
7) Bureaucratic prerogative
8) Other barriers _____

25 What improvements do you think are imperatively needed in the Dalian context to facilitate the integration of SEA with planning?
1) Developing a set of overarching sustainability-based principles for SEA
2) Increasing the transparency of decision making
3) Simplifying the procedures of SEA
4) Conducting SEA as early as possible in development planning
5) Strengthening the legal requirements of SEA integration
6) Reforming the planning and assessment system
7) Strengthening SEA training and education at various government departments
8) Other suggestions _____

Strategic Environmental Assessment and Sustainability in Chinese Cities

Strategic environmental assessment (SEA) is a process that aims at ensuring that environmental aspects and sustainable principles are addressed and incorporated in the decision making levels of policies, plans and programs. The 2003 Chinese environmental impact assessment (EIA) law requires SEA to be conducted for plans and programs of land use planning, regional development, watershed and sea area planning. This inclusion of SEA requirements complemented the project-oriented EIA process and marked a real step forward for sustainability assessment in Chinese cities. The research attempts to explore the role of SEA in promoting sustainability as well as the effective approach to SEA in urban development in China. The questionnaire below is design to collect the information on the practitioners' knowledge and attitude on SEA and sustainability in Dalian city which is selected as the site of the case study in this research.

Dalian Urban Development Master Plan was approved by the State People Congress in 2000 and became an official development guideline for year between 2000 and 2020 at Dalian city. The SEA application on this Master Plan was undertaken in 2006. The following interview questions are relevant to this process in general. The interviewees' privacy and confidentiality of the information they provide will be protected in this research.

Interview Questions

1. How do the Dalian government and other agencies make decisions regarding urban development, especially when there are conflicting interests?
2. What core values of sustainable development has been attached importance in Dalian's development planning, for example, equity, participation, efficiency, precaution and adaptation, and integration?
3. Was there a wide acknowledgement of the value of SEA in the planning process among decision makers? And was there political and institutional willingness to incorporate SEA into planning and decision-making?
4. Did the existing planning and assessment system facilitate the integration of SEA into planning process? What were opportunities and constraints?
5. What are your suggestions for use of SEA as a tool towards promoting sustainability at Dalian?

APPENDIX 2 TABLES AND BOXES

Ten advantages of SEA for sustainability	Ten barriers for effective implementation
1. provides a process for integrated pursuit of sustainability objectives in policy making and planning	1. limited information and unavoidable uncertainties
2. operationalises sustainability principles	2. boundary-setting complexities
3. improves the information base for policy making, planning and programme development	3. primitive methodologies
4. is proactive and broad in ways that strengthen consideration of fundamental issues	4. difficulties in defining the proper role of public participations and ensuring effective involvement.
5. improves analysis of broad public purposes and alternatives	5. coordination and integration of strategic assessment processes at other levels
6. facilitates proper attention to cumulative effects	6. institutional resistance
7. facilitates greater transparency and more effective public participation at strategic level	7. conflict between integrated assessment and bureaucratic fragmentation
8. provides a framework for more effective and efficient project-level assessments	8. jurisdictional overlap
9. provides a base for design and implementation of better projects where project-level assessment is not required	9. limitations of the standard rational planning and policy making model
10. facilitates establishment of a more comprehensive overall system of sustainability application at all levels from the setting of decision objectives to the monitoring of implementation effects	10. resistance to integration of strategic assessment in core decision making

Table 1: Advantages of and Barriers to SEA for Sustainability
Source: Stinchcombe and Gibson (2001)

Forms of Integration

1. Substantive

- The integration of physical or biophysical issues with social and economic issues
- The integration of emerging issues such as health, risks, bio-diversity, climate changes and so on
- The (appropriate) integration of global and local issues

2. Methodological

- The integration of environmental, economic and social (impact) assessment approaches such as cumulative assessment, risk assessment, technological assessment, cost/benefit analysis, multi-criteria analysis
- The integration of the different applications, and experiences with the use of particular tools such as GIS
- The integration and clarification of (sector) terminologies (including 'strategic')

3. Procedural

- The integration of environmental, social, economic planning/assessment, spatial planning and EIA
- The integration of sector approval/licensing processes, spatial planning and EIA
- The adoption of coordinating, co-operation and subsidiarity as a guiding principles for (governmental) planning at different levels of decision making
- The integration of affected stakeholders(public, private, NGO in the decision-making process
- The integration of professional in a truly interdisciplinary team

4. Institutional

- The provision of capacities to cope with the emerging issues and duties
- The definition of a governmental organization to ensure integration
- The exchange of information and possibilities of intervention between different sectors
- The definition of leading and participating agencies and their respective duties and responsibilities

5. Policy

- The integration of 'sustainable development' as overall guiding principles in planning and EIA
- The integration of sector regulation
- The integration of sector strategies
- The timing and provisions for political interventions
- Accountability of government

Box 1 Forms of Integration
Source: Eggenberger and Partidário (2000).

Summary of China's SEA Provisions in the 2003's EIA Law

Part 2: EIA of Plans and Programmes

Article 7: **EIA of Plans and Programmes**. State Council's departments, city governments above county-level, and relevant departments should organize EIA during the production of plans or programmes on land use and exploration, utilization and development of river basins and coastal areas, and produce relevant environmental assessment reports. The environmental assessment report should include the analysis, prediction and evaluation of likely adverse environmental impacts and measures for the prevention or reduction of the impacts; the report should be submitted with the plan or programme proposal. Approval authorities should not review the draft plan or programme if there is no relevant environmental assessment report.

Article 8: **Special Plans or Programmes**. Plans or programmes concerning agriculture, stockbreeding, forestry, energy, water management, transport, civil construction, tourism and development of natural resources are defined as Special Plans or Programmes. State Council departments, city governments above county-level, and relevant departments should organize an EIA before submitting draft Special Plans or Programmes, and should submit the EIA report together with the draft.

Article 9: **Scope**. The scope of the plans or programmes indicated in Articles 7 and 8 is to be declared by the State Council.

Article 10: **Content of Report**. (1) Impact analysis, prediction and evaluation; (2) measures of prevention and reduction; and (3) conclusion.

Article 11: Public Participation. Departments who draft Special Plans or Programmes that could cause possible adverse environmental impacts and directly affect public interests should hold a hearing or other approaches to collect the opinions of relevant organizations, experts and the public before submitting the proposal. The exception would be given to confidential circumstances in accordance with relevant regulations. The department should consider public opinions carefully, and include with the EIR an explanation as to how they responded to the public opinions.

Article 12: **Submission of EIR**. Departments who draft Special Plans or Programmes should submit the EIR together with the draft of the program or plan. Approval authority will not review the draft plans or programmes if there is no EIR.

Article 13: **Review Process**. Before the relevant authority approves a Special Plan or Programme, it should appoint an EPB or other relevant department to organize a review team which consists of department representatives and experts. The review team should review the EIR of the Special Plan or Programme and submit a written report. The experts in the review team should be randomly selected from the relevant database of experts, set up according to SEPA's regulations. For those Special Plans or Programmes which should be approved by governments, or their departments, above province-level, the measures for reviewing the EIR of those programmes or plans are produced by SEPA together with other State Council departments.

Article 14: **Decision-making**. City governments above county-level and government departments above province level should take the conclusion of an EIR and its review comments as important grounds for deciding whether or not to approve the draft Special Plans or Programmes. If the conclusion of an EIR and its review comments are not adopted by the approval authority, an explanation should be given and

recorded.

Article 15: Follow-up. After plans or programmes which would possibly cause significant adverse environmental impacts are implemented, the department responsible for drafting the plan or programme should conduct a follow-up assessment after a suitable period, and submit the follow-up assessment report to the original approval authority. If adverse impacts become obvious during the implementation of the plan or programme, mitigation measures must be put forward immediately.

Box 2. Summary of China's SEA Provisions in the 2003 New EIA Law
Source: Wang *et al.* (2002)