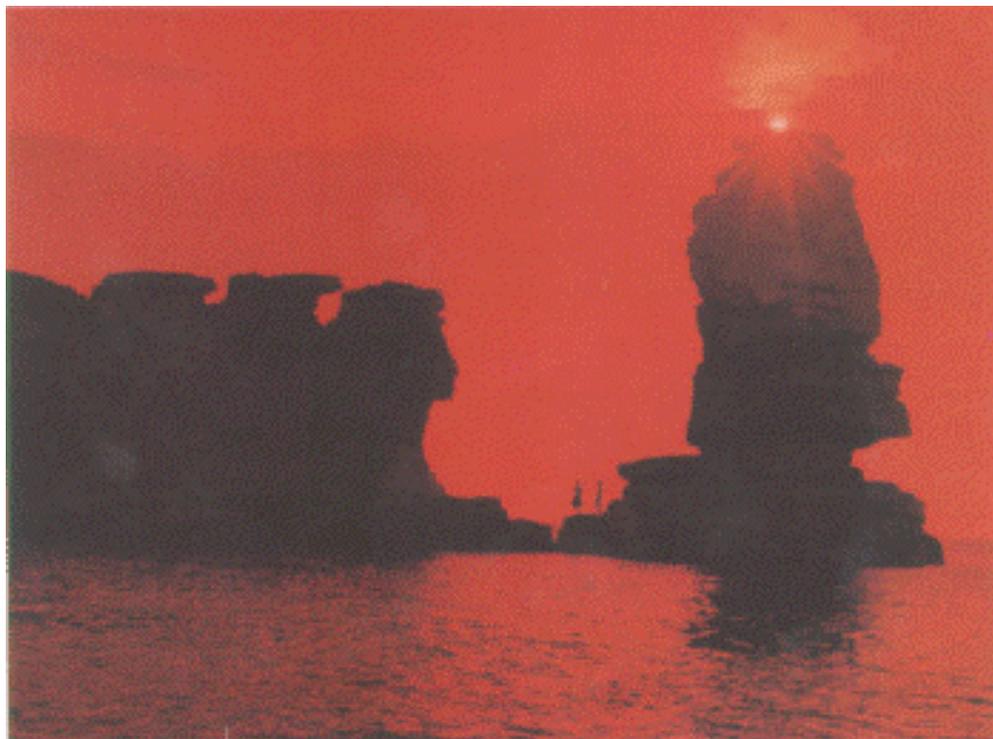


# **Beyond nuts and bolts: How organisational factors influence the implementation of environmental technology projects in China**



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## Preface and acknowledgements

This thesis has been a trial of patience, and not only for me. First, I would like to thank Kirsti Hermansen, for bearing over with my countless outbursts of frustration, and a similar number of sleepless nights due to my somewhat unconventional working hours and -places. My parents Gro and Bjørn Buen as well as my sister Katja have supported me and (perhaps more important) urged me to finish this study to take on new and different challenges.

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Some notes to the text:

The picture on the cover is taken at Tower Reef, Long Island, Yantai. The Chinese aphorisms introducing some of the chapters in the thesis are found in Gong and Yu (eds.) (1998), *Chinese Maxims – Golden Sayings of Chinese Thinkers*.

A number of the newspaper articles cited in this study are not signed. As most of these articles are from one newspaper, namely *China Daily*, I have chosen to cite all newspaper articles in footnotes rather than in the text, as the latter solution would require a very time-consuming (and probably confusing for the reader) categorisation of the articles. This is also true for web addresses. Furthermore, if no publication year is provided at a web page, the year the page was first visited is cited.

I have tried to write Chinese names with their family name first, as is the habit in China. However, this is not always easy. Several Chinese family names and given names are identical. Furthermore, many Chinese – especially those living in the English-speaking world – nowadays tend to write their name according to the standards associated with the Latin alphabet, starting with the given name, followed by the family name. I apologise for possible mistakes.

Please also note that due to a major restructuring of the Chinese government starting from March 1998, a number of national-level ministries go by two different names in the text; one for the period before March 1998, and one for the period afterwards. See the list of abbreviations for details.

The Chinese governmental structure is extremely complicated. Therefore, I have enclosed an illustration of it (see Appendix 0). I would strongly advise readers to take a look at this figure before reading the rest of the text, as this will make the reading of the thesis – especially the empirical chapters and the empirical analysis – much easier.

Trondheim, 8 February 2001,

Jørund Buen

## Abbreviations

A21: Agenda 21

ACCA21: Administrative Centre for China's Agenda 21

ADB: Asian Development Bank

AIJ: Activities Implemented Jointly

CA21: China's Agenda 21

CBD: United Nations Convention on Biological Diversity

CCICED: China Council for International Co-operation on Environment

CCP: China's Communist Party

CDM: Clean Development Mechanism

CER: Certified Emission Reduction

CESTT: Centre for Environmentally Sound Technology Transfer, ACCA21

CICETE: China International Centre for Economic and Technical Exchange

CMSA: China Maritime Safety Administration

CSD (or UNCSD): United Nations Commission on Sustainable Development

CSDNP: China's Sustainable Development Networking Program (also called SNDP)

EIBC: Export-Import Bank of China

ENB: Earth Negotiations Bulletin

EPB: Environmental Protection Bureau

ERM China: Environmental Resources Management China

EST: Environmentally sustainable technology

ETCC: Environmental technology co-operation capacity

FDI: Foreign direct investment

FNI: The Fridtjof Nansen Institute

GDP: Gross domestic product

GHG: Greenhouse gas

GNP: Gross national product

GONGO: Government-organised non-governmental organisation

IET: International Emission Trading

IIASA: International Institute for Applied Systems Analysis

IMO: International Maritime Organisation

IPCC: Intergovernmental Panel on Climate Change

JI: Joint Implementation

LA21: Local Agenda 21

MEPL: The Marine Environmental Protection Law  
MLR: Ministry of Land and Resources  
MOC: Ministry of Communications  
MOF: Ministry of Finance  
MOFTEC: Ministry of Foreign Trade and Economic Co-operation  
MOST: Ministry of Science and Technology (formerly SSTC)  
NEPA: National Environmental Protection Agency (now SEPA)  
NGO: Non-governmental organisation  
NIVA: Norwegian Institute for Water Research  
NORAD: Norwegian Agency for Development Co-operation  
NOSCA: Norwegian Oil Spill Control Association  
NPC: National People's Congress  
NUPI: Norwegian Institute of International Affairs  
ODA: Overseas development aid  
OECD: Organisation for Economic Co-operation and Development  
OPRC: The International Convention on Oil Pollution Preparedness, Response and Co-operation  
PACE: Professional Association for China's Environment  
PDI: Planning and Design Institute (here: MOC's Planning and Design Institute)  
PLA: People's Liberation Army  
PPCA21 1994: Priority Programme for China's Agenda 21 – First Tranche 1994  
PPCA21 1996: Priority Programme for China's Agenda 21 – Revised Edition 1996  
P.R.C.: People's Republic of China  
R&D: Research and development  
RMB: Renmimbi (China's currency)  
SCOT: The social construction of technology model  
SDPC: State Development Planning Commission (formerly SPC)  
SEPA: State Environmental Protection Administration (formerly NEPA)  
SEPC: State Environmental Protection Commission  
SETC: State Economic and Trade Commission  
SFT: Norwegian Pollution Control Authority  
SNDP: See CSDNP above  
SPC: State Planning Commission (now SDPC)  
SO<sub>2</sub>: Sulphur dioxide  
SOA: State Oceanic Administration  
SSTC: State Science and Technology Commission (now MOST)  
TVIE: Town and Village Industrial Enterprise  
UN: United Nations

UNCTAD: United Nations Conference on Trade and Development

UNCED: United Nations Conference on Environment and Development

UNDP: United Nations Development Programme

UNCSD: See CSD above

UNFCCC: United Nations Framework Convention on Climate Change

URA: Unitary, rational actor

URL: Uniform Resource Locator (the global address of documents and other resources on the World Wide Web)

USD: United States dollars

WCED: World Commission on Environment and Development

WHO: World Health Organisation

WTO: World Trade Organisation

YHA: Yantai Harbour Authority

YMSSB: Yantai Maritime Safety Superintendent Bureau

# Table of contents

<b>PREFACE AND ACKNOWLEDGEMENTS.....</b>	<b>II</b>
<b>ABBREVIATIONS.....</b>	<b>V</b>
<b>TABLE OF CONTENTS.....</b>	<b>VIII</b>
<b>LIST OF FIGURES.....</b>	<b>XI</b>
<b>LIST OF TABLES.....</b>	<b>XI</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>1 INTRODUCTION.....</b>	<b>5</b>
1.1 BACKGROUND .....	5
1.2 RESEARCH QUESTION AND DELIMITATION OF CASE STUDY.....	9
1.3 SOME INITIAL CONCEPTUAL CLARIFICATIONS.....	12
1.4 OUTLINE OF STUDY.....	15
<b>2 ANALYTICAL FRAMEWORK: EXPLAINING IMPLEMENTATION – A MULTIDISCIPLINARY APPROACH.....</b>	<b>18</b>
2.1 DEFINING AND OPERATIONALISING THE DEPENDENT VARIABLE: ASPECTS OF IMPLEMENTATION .....	19
2.2 CLARIFYING THE INDEPENDENT VARIABLES: THREE ORGANISATIONAL FRAMEWORK CONDITIONS .....	25
2.2.1 <i>Horizontal fragmentation</i> .....	29
2.2.2 <i>Vertical fragmentation</i> .....	35
2.2.3 <i>Relative strength of implementing agencies</i> .....	39
2.3 SUMMARY AND CONCLUSION .....	42
<b>3 METHODOLOGICAL REMARKS.....</b>	<b>44</b>
3.1 THE EPISTEMOLOGICAL MERITS OF THE SINGLE CASE STUDY APPROACH.....	44
3.2 CRITERIA FOR THE CHOICE OF CASE .....	46
3.3 DATA COLLECTION .....	48
3.3.1 <i>Preparatory interviews</i> .....	49
3.3.2 <i>Fieldwork</i> .....	50
3.3.3 <i>Interviews</i> .....	50
3.3.4 <i>Written material</i> .....	53
3.4 CROSS-CULTURAL CHALLENGES.....	54
3.5 RELIABILITY AND VALIDITY .....	56
3.5.1 <i>Construct validity</i> .....	56
3.5.2 <i>Internal validity</i> .....	57
3.5.3 <i>External validity</i> .....	58
3.5.4 <i>Reliability</i> .....	61

3.6	SUMMARY AND CONCLUSION .....	62
<b>4</b>	<b>EMPIRICAL MAPPING OF THE DEPENDENT VARIABLE: THE IMPLEMENTATION EFFECTIVENESS OF CHINA'S AGENDA 21 PROJECT 6-8 SO FAR.....</b>	<b>63</b>
4.1	CHINA'S SEAS – HOPE OR DEMISE?.....	63
4.2	IMPLEMENTATION EFFECTIVENESS OF PROJECT 6-8: ON THE PATH TOWARDS SUCCESS? .....	65
4.3	SUMMARY AND CONCLUSION .....	76
<b>5</b>	<b>EMPIRICAL MAPPING OF INDEPENDENT VARIABLES: THREE ORGANISATIONAL FRAMEWORK CONDITIONS.....</b>	<b>78</b>
5.1	HORIZONTAL FRAGMENTATION .....	79
5.2	VERTICAL FRAGMENTATION.....	95
5.3	RELATIVE ORGANISATIONAL STRENGTH .....	100
5.4	SUMMARY AND CONCLUSION .....	113
<b>6</b>	<b>EMPIRICAL ANALYSIS I: DOMESTIC ORGANISATIONAL CHALLENGES FACING THE IMPLEMENTATION OF ENVIRONMENTAL TECHNOLOGY POLICY IN CHINA.....</b>	<b>115</b>
6.1	FRAMEWORK CONDITIONS.....	116
6.1.1	<i>Horizontal fragmentation: Competing compartments revisited.....</i>	<i>116</i>
6.1.2	<i>Vertical fragmentation: The fight for foreign funding.....</i>	<i>121</i>
6.1.3	<i>Relative organisational strength.....</i>	<i>125</i>
6.2	REFLECTIONS ON IMPLEMENTATION THEORY .....	128
<b>7</b>	<b>EMPIRICAL ANALYSIS II: PUTTING THE ACTORS BACK IN.....</b>	<b>129</b>
7.1	THE IMPACT OF INDIVIDUALS, AND THE TERRITORIES OF TECHNOLOGY .....	130
7.2	RELEVANT ACTORS' STRATEGIES .....	139
7.2.1	<i>Individual-cum-organisational relation-building .....</i>	<i>141</i>
7.2.2	<i>Tactical translations of technology.....</i>	<i>147</i>
7.3	SUMMARY AND CONCLUSION .....	152
<b>8</b>	<b>CONCLUSIONS AND THEORETICAL IMPLICATIONS.....</b>	<b>155</b>
8.1	CONCLUSIONS: THE 21 AGENDAS .....	155
8.1.1	<i>Prospects for China's Agenda 21 .....</i>	<i>159</i>
8.1.2	<i>Success factors.....</i>	<i>161</i>
8.1.3	<i>Westward ho? .....</i>	<i>163</i>
8.1.4	<i>Implications for greenhouse gas abatement projects in China.....</i>	<i>164</i>
8.1.5	<i>Towards avoidance technology .....</i>	<i>166</i>
8.2	THEORETICAL IMPLICATIONS: DOMESTICATING INTERNATIONAL THEORIES, OR INTERNATIONALISING DOMESTIC ONES? .....	169
8.2.1	<i>Implications for research on environmental technology policy implementation in China .....</i>	<i>169</i>
8.2.2	<i>Exploring linkages between the domestic and the international arena: agent and structure revisited.....</i>	<i>172</i>
8.2.3	<i>Closing remarks.....</i>	<i>178</i>

<b>9</b>	<b>REFERENCES .....</b>	<b>179</b>
<b>10</b>	<b>APPENDICES .....</b>	<b>204</b>
10.1	INTERVIEW GUIDE .....	204
10.2	LIST OF INTERVIEWEES .....	209
10.3	CHINA'S SUSTAINABLE DEVELOPMENT CHALLENGES AND ITS FOLLOW-UP OF AGENDA 21 – A SHORT OVERVIEW .....	214
10.4	CHINA'S AGENDA 21 PROJECT 6-8 - PROJECT DESCRIPTION .....	225
10.5	OVERVIEW OF CA21 PROJECTS INVOLVING NORWEGIAN BUSINESS AND GOVERNMENT .....	229
10.6	CHINESE GOVERNMENTAL STRUCTURE.....	230

**List of figures**

Figure 2.1 Preliminary causal model.....19  
Figure 2.2 Causal relationships between independent variables and dependent variable.....43  
Figure 4.1 Project area in perspective .....67  
Figure 5.1 Main bureaucratic actors involved in Yantai project implementation .....80  
Figure 7.1 Concentric circles – an illustration of individual-organisational relation building.145  
Figure 7.2 Revised analytical model integrating organisational framework conditions and relevant actors’ strategies..... 154  
Figure 8.1 Preliminary model of international environmental technology co-operation.....177

**List of tables**

Table 2.1 Dimensions of difference between decision-oriented and process-oriented approaches to implementation.....22  
Table 10.1 China’s natural resources .....216

## **Executive summary**

The theme of this study is how organisational framework conditions within the People's Republic of China (P.R.C.) influence the implementation of environmental technology projects in the country. This is empirically documented and analysed through a case study of factors influencing the implementation status of a Sino-Norwegian technological co-operation project for prevention and control of oil spills, included in China's Agenda 21 (CA21).

The argument is the following: the more horizontally and vertically fragmented authority is among the governmental actors involved in the implementation of the case project, the less likely it is that the implementation status of the case project is positive. Given that authority is fragmented horizontally and vertically: the weaker the agencies implementing the project are, compared to organisational opponents of the project, the less likely it is that the implementation status of the project is positive.

While not integrated in the analytical framework, a linkage was suggested between the prevalence of horizontal and vertical fragmentation of authority, relative organisational weakness of implementing agencies, and two types of actor strategies. In this way, the analytical framework comes closer to establishing clear-cut causal mechanisms from independent to dependent variables in the sense that it incorporates both structures and the actions of actors influenced by these structures.

It was suggested that the less successful implementing agencies are in individual-cum-organisational relation building with strategic partners, and in tactically translating the technology to be used in the project to suit their own organisational purposes, the less likely it is that the implementation status of the Yantai project is positive. Integrate relevant actors' strategies in the analytical framework as well. The main reason is that in order to be able to establish clear-cut causal mechanisms from independent to dependent variables, the analytical framework needs to be dynamic in the sense that it incorporates both structures and the actions of actors influenced by these structures. The conclusions are summarised in the revised analytical model below.

The implementation status is judged as sub-optimal for four reasons. First, the project site and main technological focus have been moved during the implementation process. Second, the capacity component of the project has been given much less attention than the hardware part. Third, the Sino-Norwegian co-operation has been discontinued. Fourth, a comprehensive and co-ordinated follow-up of the pilot project seems unlikely given the organisational framework conditions in which it is embedded.

Horizontal fragmentation characterised the implementation process of the Yantai project, for five reasons. First, the central planning bureaucracies responsible have not been sufficiently involved in the co-ordination of CA21. Second, the environmental protection bureaucracy has been ostracised from the CA21 process, and has therefore implemented parallel and/or competing initiatives. Third, as the foreign economic co-operation bureaucracy has also been excluded from the CA21 process, the division of responsibilities between this bureaucracy and the CA21 administration has remained unclear in the implementation of the CA21 priority projects. Fourth, Local Agenda 21 initiatives have not been sufficiently co-ordinated with the implementation of CA21 priority projects on the central level. This is closely related to a fifth and more general point, namely that the implementation of CA21 priority projects has not been co-ordinated with the CA21 administration to a sufficient extent. Sixth, the division of responsibilities between the local marine safety administration in the case study area on the one hand, and the local government on the other does, do not seem to have been clarified.

The implementation process of Project 6-8 has been vertically fragmented as well. Partly because it has been top-down initiated, it has not been anchored locally to a sufficient extent. Furthermore, a clearly defined CA21 administrative structure is lacking on lower levels of government. Local-level subsidiaries have their own agenda, separate from central-level bureaucracies; this manifested itself in rivalry among different Ministry of Communications (MOC) subsidiaries for the case project.

Vertical and horizontal fragmentation of authority have given room for the Ministry of Communications to position itself within the issue area of marine oil pollution through formulating and implementing the case project. The communications bureaucracy is still organisationally stronger in relative terms along all parameters than its opponents (the oceanic administration, and the environmental protection bureaucracy).

The planning, foreign economic co-operation and science and technology bureaucracies have all been substantially weakened in absolute terms regarding jurisdiction after the 1998 restructuring, but still have considerable strength relative to their organisational opponents regarding authority over CA21 administration. The strengthening of the CA21 administrative centre itself in absolute terms has so far had minor implications for the CA21 administration. This is true even for the environmental protection bureaucracy, although it has been strengthened in relative terms both compared to the CA21 administration and the area of marine oil pollution on all measured parameters.

The discontinuation of the Sino-Norwegian technology co-operation is mainly explained by:

- Lack of integration of planning and foreign financing bureaucracies in CA21 at large and the Yantai project in particular, and the subsequent lack of priority given to the project by these bureaucracies.
- The central-local dimension of the fight for foreign funding.
- The lack of relation building with possible local funding sources, especially local authorities, on the part of the local marine safety bureaucracy in the case area.

The project's focus has seemingly narrowed from technology towards technicalities, due to the local marine safety administration's excessive focus on technical aspects of technology co-operation (as opposed to MOC).

The changed technological (and geographic) profile of CA21 Project 6-8 seems to have been caused by

- Lack of co-ordination between the CA21 administration and the implementing agency, as well as the CA21 administration's lack of capacity to follow up the project locally.
- The relative organisational strength of the communications bureaucracy compared to its opponents in the issue area of marine oil pollution.
- The tactical translation of technology by MOC.
- Differing technological frames among the actors implementing the project.

A comprehensive and co-ordinated follow-up of the Yantai project is rather unlikely. Some of the reasons are:

- Lack of co-ordination between the CA21 administration and implementing agencies.
- Lack of co-ordination between Local Agenda 21 initiatives and CA21 priority projects.

- CA21 lacks and administrative structure on lower administrative levels.
- The separate agenda of YMSSB and its rivalry with other harbours for the Yantai project.
- The relative organisational strengthening of the environmental bureaucracy, which has been ostracised from the CA21 process.
- The operative responsibilities in an emergency situation between YMSSB directly under the central government, and the local government, seem unclear.

While this study takes a largely structure-oriented analytical approach, it ends by suggesting to integrate relevant actors' strategies in the analytical framework as well. The main reason is that in order to be able to establish clear-cut causal mechanisms from independent to dependent variables, the analytical framework needs to be dynamic in the sense that it incorporates both structures and the actions of actors influenced by these structures.

“China’s success in implementing its Agenda 21 is clearly critical to its own future, as it has been widely recognised, but it is also critical, indeed, imperative, to the future of all of us”

*Maurice F. Strong, Secretary General of UNCED, opening ceremony 1<sup>st</sup> High Level Round Table Conference for China’s Agenda 21, 7-9 July 1994.*

## 1 Introduction

The theme of this study is the implementation of environmental technology projects in China. The case is a project for prevention and control of oil spills, included in China’s Agenda 21 (CA21).<sup>1</sup> The analysis will concentrate on organisational framework conditions in China influencing the implementation status of the project.

### 1.1 Background

In 1992, more than hundred heads of state, among them China’s former Premier Li Peng, convened in Rio de Janeiro, Brazil. The reason for this largest gathering of state leaders ever was the United Nations Conference on Environment and Development (UNCED). This was the first international conference to address urgent problems of environmental protection *and* socio-economic development within one single framework. The Earth Summit, as it was also called, agreed *inter alia* on the principles of Agenda 21 (A21), a seven hundred-page plan containing thirty-four chapters with more than two thousand recommendations for action to achieve sustainable development in the 21<sup>st</sup> century.<sup>2</sup>

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<sup>1</sup> A *project* is a planned set of activities with the aim of attaining specific objectives within a given budget and time frame, using limited human, financial and physical resources (Dale 1998: 20). A *programme* is defined here as a group of projects or initiatives directed towards similar or related overall objectives within a sector or a region.

<sup>2</sup> The concept of sustainable development is used several times in this thesis. While the vagueness of the concept may be a political strength, it is criticised for being all-encompassing, thus allowing for countless and often inconsistent interpretations (Svarstad 1991, Lélé 1991). Is sustainability to be interpreted literally, as sustaining anything that has been, e.g. economic growth; ecologically, as ecologically sustainable development; or socially, as sustaining the social basis of human life? Should development be understood as a process (of growth? change?) or as an objective (satisfaction of basic needs or less fundamental needs?)? The World Commission on Environment and Development (WCED 1987: 43), defines it as development that “meet[s] the needs of the present without compromising the ability of future generations to meet their own needs”, has been recognised by most of the world’s governments and thus is a very important reference point in the debate on environment and development. This definition, which is used in this thesis, also incorporates the view of the Third World countries including China that poverty alleviation must be an important component in a sustainable development strategy.

Now, this century has begun, and a number of points have become increasingly clear. First, reaching the goal of sustainable development will not only require that the North reduces its level of production and consumption, but also demands that the South, including China, chooses a more environmentally friendly development path than did the North (Brown 1998:12-14).<sup>3</sup> Second, a window of opportunity might exist; developing environmental technology solutions could be less difficult in the South than in the North, as the former's technological and institutional infrastructures are still not established to the same extent (Jansen 1994: 516, Buen 2000c: 26). However, within a few decades, this opportunity will probably be lost. Third, countries in the South will not be capable of making the necessary environmental quantum leap unless they can take advantage of environmental technology transferred from the North (Agenda 21 1992, UNCSD 1997). Finally, their capacity to do so has not improved since A21 was launched (UNCSD 1997: 28).

Agenda 21 (1992) refers to institutional capacity building as an important stepping-stone towards sustainable development. Southern countries are more vulnerable to environmental damage than are Northern countries (see e.g. Murvoll 1997: 10). One way for countries in the South to reduce their vulnerability is to strengthen their ability to implement environmental technology projects. For that to happen, bi- and multilateral aid authorities as well as decision-makers in the countries in question must have knowledge of the most important organisational factors influencing this kind of capacity. This study seeks to contribute to generate such knowledge.

The global Agenda 21 called on national leaders to implement Agenda 21 in their home countries. There has been a tremendous growth in environmental initiatives in the years since the Rio Conference. Many governments have made comprehensive, long-term and integrated national plans; created new institutions to implement these plans; and issued reports on implementation progress (Meadowcroft 1999: 223-225). Nevertheless, "the momentum generated in Rio dissipated quickly", resulting in "a very large implementation gap between its rhetoric and reality" (Scherr and Barnhizer 1997: 33).

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<sup>3</sup> The reason for using the terms "North" and "South", and not "developed/developing countries" or "the first/third world", unless citing authors specifically using other terms, is that the two last-mentioned terms are value-laden and politicised. Another reason is that it is hard to find a common denominator for the countries relevant here, that is, countries squeezed between pressing environmental problems and an even stronger pressure for economic and social development. Most of these countries are situated in the Southern Hemisphere. However, although this categorisation is judged more fruitful, it too is very imprecise, somewhat value-laden, and hides enormous differences, both regarding conditions for economic and social development and the seriousness of environmental problems.

The efforts for the transfer of environmental technology are no exception in this regard (Odegard 1998, ENB 1997). Agenda 21 emphasised that “access to and transfer of environmentally sound technologies (...) will be essential to increase the capabilities, in particular of countries in the South, to achieve sustainable development”.<sup>4</sup> However, there are at present few signs that the South is actually getting the environmental technology needed to solve its pressing problems.

The Earth Summit +5 in 1997 concluded that “the level of technology and technology-related investments from public and private sources in developed countries directed towards developing countries has not (...) been realised as envisaged at UNCED” (UNCSD 1997). Furthermore, the lack of transfer of environmental technology was highlighted as a central bottleneck in the implementation of A21. The Earth Summit +5 Final Document states that “[t]here is an urgent need for developing countries to acquire greater access to environmentally sound technologies, if they are to meet the obligations to UN and international conventions” and that “it is important to identify barriers and restrictions to the transfer of publicly and privately owned environmentally sound technologies, with a view to reducing such constraints”.<sup>5</sup>

In the wake of strict environmental regulations, especially in the North, strong pressure from non-governmental organisations, and increasing public and private willingness to finance research and development within this sector, the environmental technology industry in the North is growing faster than most other industrial sectors. In 1994, the environmental technology industry in Europe employed 600.000 people. The global environmental market in 2000 has been estimated to be between 300 and 580 billion US dollars (OECD 1996, Barton 1998), and the annual growth of this market between 1990 and 2000 has been estimated at 5.5% (EC 1994, Barton 1998).

If both environmental technology industries and decision-makers in the North as well as in the South acknowledge the urgent need for environmental technology to be transferred to and utilised in Southern countries, why is not this happening?

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<sup>4</sup> Agenda 21, Chapter 34, points 34.5-34.7.

<sup>5</sup> Earth Summit+5, Final Document, point 88 (UNCSD 1997).

From the very first global conference on the environment in Stockholm in 1972, via UNCED and the Earth Summit +5 to the ongoing climate negotiations, problems of co-ordination within and between donor countries and organisations as well as barriers to technology transfer inherent in the international economic system have been strongly emphasised.<sup>6,7</sup> Countries in the South very often see initiatives from the North for global environmental co-operation as a strategy to maintain control over resources, technology and economic power. Thus, the countries in the South attempt to link economic and trade issues with environmental issues, most importantly through the issue of technology transfer (Porter and Brown 127-134). Dr. Song Jian, then State Councillor of the People's Republic of China, probably represented the opinion of many countries in the South when he said at Earth Summit +5 that (Song 1997):

[O]ne important condition for any progress in international environment- and development co-operation is the provision of financial resources and transfer of technology to developing countries. Till now, most developed countries have not made good their commitments. The percentage of their ODA [overseas development aid] in GNP has dropped to the lowest level in 25 years. What is more worrisome is that some developed countries are pursuing new trade protectionism under the pretext of environmental protection, which has a very negative impact on the external environment for the sustainable development of developing countries.

A21 lists a number of means to facilitate environmental technology transfer. However, little or nothing is said about how these principles should be put into practice in a specific social, cultural and political context. Hence the present study is founded on the assumption that donor commitment and favourable international conditions for environmental technology *transfer* are not sufficient conditions for implementation of environmental technology projects in a particular developing world socio-cultural setting. Thus, more focus should be granted to the *domestic* (national and sub-national) framework conditions and strategies affecting the implementation of environmental technology projects.

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<sup>6</sup> For an overview of problems marring international financial transfers for the environment, see Keohane and Levy (eds.) (1996), especially chapters 1-3, 9 and 10. While this study will not focus upon the impact of bi- and multilateral aid organisations on technology development in countries in the South like China, a reasonably good overview of this field taking roughly the same theoretical departure as this study is Olsen (1995).

<sup>7</sup> For discussions of international economic barriers to technology co-operation relevant for the topic at hand, see Lorentzen (1988: 1-6), Barnett (1995), or Odegard (1998).

## 1.2 Research question and delimitation of case study

This thesis examines how factors *within the recipient country* influence the *implementation* of environmental technology projects resulting from North-South technology co-operation, taking China as a point of departure.

The Chinese government was a pioneer in the follow-up of the A21. An extensive White Paper (ACCA21 1994c) and a list of priority projects intended to operationalise the objectives set forth in the White Paper were published in 1994, less than two years after the Rio Summit.<sup>8</sup> China has the opportunity – and the burden – of meeting all the environmental challenges facing countries in the North until this date, simultaneously. Whether or not the country will succeed in carving out a coherent, comprehensive and foresighted environmental policy enabling it to leapfrog many of the environmental problems associated with industrialisation will be of extraordinary importance both for the country itself and for the global environment.<sup>9</sup>

Kenneth Lieberthal, one of the leading scholars in the area of Chinese politics, and (until very recently) Special Advisor for U.S. President Bill Clinton, leaves no doubt about how strenuous China's way towards sustainable development will be. He states that “environmental catastrophes are reaching the point where they threaten to unbalance the current population distribution and spatial economy of China, with potentially massive consequences”. He continues: “A matter of increasing importance will be whether the political system can respond effectively to these challenges to prevent them from producing large-scale population migrations, major social distress, and possibly catastrophic economic and health consequences.”<sup>10</sup> In suggesting solutions to this problem, Lieberthal emphasises that China must “devote substantial resources to development of basic technological capabilities, including (...) nurturing the ability to absorb and rapidly disseminate new technologies” (Lieberthal 1991: 75-76).

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<sup>8</sup> Key documentation on China's Agenda 21 are ACCA21 (1994a, b, c, 1995a, b, 1996a, b, 1997a, b), and SPC/SSTC (1994a, b). Two very good analyses of organisational aspects of China's Agenda 21 are Finamore and Holcombe (1994) and Gan L. (1999, see Gan L. 1998 for more details). UNCSD (1994), Mohamed and Kikula (1996), Wong (1999) and Xi (1999, 2000) also contain some interesting viewpoints.

<sup>9</sup> For overviews of China's environmental challenges, see Edmonds (1994, 1999), and Smil (1994, 1997). For a particular focus on environmental policy and its implementation, see Chan et al. (1995), Economy (1994), Heggelund (1993), Hills and Man (1998), Jahiel (1994, 1997, 1998), Lieberthal (1997), Ross (1984, 1988, 1992), Sinkule (1993), Sinkule and Ortolano (1995), and Tang et al. (1997). In addition, China Quarterly, Issue 156 (December 1998) concentrates exclusively on China's environmental problems and its efforts to tackle them.

<sup>10</sup> An overview of China's energy and environmental problems is given in Buen (1998b).

A21 is still developing, and one could therefore contend that it is premature to analyse possible problems related to its implementation on the national and sub-national level. The problem with such an argument is that we just cannot afford to postpone analyses of A21 until the time has come for the benefit of hindsight (Scherr and Barnhizer 1997). The fact that the Earth Summit +5 in 1997 was held in the first place, is proof good enough that world leaders regard it both necessary and feasible to evaluate national follow-ups of A21 after only five years. As China's Agenda 21 (CA21, 1994) was the first national follow-up of the global A21, an analysis of the implementation of CA21 is the place to start building on the conclusions reached at the Earth Summit +5.<sup>11</sup> As Finamore and Holcombe (1994: 1) note, such an analysis could provide valuable lessons for A21 implementation – and the study of such – in other countries as well.

This study examines how organisational conditions have influenced the strategies of the bureaucratic actors involved in the implementation of CA21, and particularly Project 6-8 in the 1994 Priority Programme for CA 21 (SPC/SSTC 1994b).<sup>12,13</sup> At its most general, the research question of this study is thus:

***How do organisational framework conditions within the People's Republic of China influence the implementation of environmental technology projects in the country?***<sup>14</sup>

This question is, as indicated, to be elaborated through studying the implementation process of the CA21 Project 6-8. Thus, it is hoped that the study can contribute to the understanding of the above-mentioned subject by answering a more manageable and specific research question:

***How have organisational framework conditions influenced the implementation status of China's Agenda 21 Project 6-8?***

To answer this question, a closer look will be taken at the characteristics of the organisations implementing CA21 Project 6-8. Central questions to be answered are: *To what extent has the*

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<sup>11</sup> It should be noted, however, that the Netherlands launched a very thorough National Environmental Policy Plan in 1989, followed by NEPP2 in 1994. The United Kingdom also launched a comprehensive plan for follow-up of Agenda 21 in 1994.

<sup>12</sup> Hereafter, the 1994 Priority Programme for CA 21 will be called PPCA21 1994. CA21 Project 6-8 will also be called "Project 6-8" and "the Yantai project" in the text. See Appendices 10.3 and 10.4 for further elaboration.

<sup>13</sup> The term "bureaucratic" may both describe (a part of) public administration, or an adjective with negative connotations, synonymous with "red tape" or "paper mill". In this thesis, the former meaning of the word is used.

<sup>14</sup> See Section 1.3 for a preliminary definition of organisational framework conditions. For a more thorough discussion of this term, see Section 2.2.

*implementation process of CA21 Project 6-8 been horizontally and vertically fragmented or integrated? How and why has the extent of such fragmentation influenced the implementation status of the project? How strong are the implementing organisations relative to the organisational opponents of the project? How and why has the relative strength of implementing agencies influenced the implementation status of the project?*

The combination of a rapidly growing economy, increasing the purchasing power of individuals and private enterprises in particular, and a deteriorating environment, makes China one of largest potential markets for environmental technology in the world. It should therefore be interesting for Norwegian representatives from business, government and research active in China to achieve a better understanding of how and why this happened, through the story of the Sino-Norwegian co-operation project included in CA21 that came closest to being implemented. It is also hoped that this thesis can contribute to providing other private and public environmental technology actors active in China with a framework within which they can better understand their own projects. This may enable them to do more realistic long-term planning of their activities, which is a necessity if projects are to succeed in China.

The study is largely taking a structural approach, but ends by integrating actor perspectives. As the study focuses on framework conditions within China for environmental project implementation, the analysis will mainly concentrate on the interaction between different Chinese bureaucracies involved in implementing the project. Possible contributions from factors related to the A21 process on the international level are not considered. For the same reason, the interaction between Chinese bureaucratic organisations and the Norwegian actors involved in the project will only be included to the extent that this contributes to deciding the values on the variables in the thesis, which exclusively focuses upon Chinese bureaucratic actors, the relationship between them, and their strategies. Characteristics of the Norwegian bureaucratic and business actors involved in environmental technology policy and projects related to China will not be analysed in this thesis.

### 1.3 Some initial conceptual clarifications

A number of concepts are used repeatedly throughout this study. Apart from one (technology transfer, which will not be used further on), they will all be defined more thoroughly at a later stage; however, some initial definitions are given in order to avoid misunderstandings.

By the term “China’s Agenda 21” is meant the People’s Republic of China’s official program for implementing the global Agenda 21 (A21) agreed upon at UNCED in 1992, through the formulation of “China’s Agenda 21 – White Paper on China’s Population, Environment and Development in the 21<sup>st</sup> Century” in 1994. A CA21 project is therefore defined here as a project included in the Priority Programme for China’s Agenda 21 (PPCA21 1994 for short; SPC/SSTC 1994b) and/or the revised Priority Programme issued in 1996. The study therefore naturally covers the period from the last part of 1992, when China started to prepare its national follow-up of the Rio Conference, until mid-1999.<sup>15,16</sup>

The word “technology” is derived from the Greek word *technologia*, consisting of the words *techne* (art, skill, craft) and *-logia* (-logy),<sup>17</sup> meaning “the systematic treatment of an art”.<sup>18</sup> There are many approaches to the understanding of what technology is and what its function in society is.<sup>19</sup> The traditional definition of technology, closely related to *classical economic theory*, sees it as “encompassing the machines and equipment necessary for transforming raw materials to finished products” (Levin 1997: 298).

However, the fundamental argument on which all hypotheses in this study are based, is that technology not only is nuts and bolts, but also the organisational and institutional elements necessary for a particular technology to function properly. The meaning of technology is not residing in the technology as such, but attributed to it by human beings. Technical systems are

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<sup>15</sup> While the fieldwork was conducted in the summer of 1999, the other parts of the case study have been updated until late 2000, so this is somewhat conservative. However, as the case study project is currently being implemented, and the dependent variable of the study is implementation *status*, it is very important to be precise in this regard, therefore I choose to be extra observant of the fact that most of the most important documents studied were produced before mid-1999.

<sup>16</sup> It could be argued that any sustainable development project in China that maintains the ideas of CA21 is a CA21 project. If so, my approach would be under criticism for being too static and narrow. However, this view has not been aired by any of the Chinese interviewees, and has therefore not been regarded as relevant for my research design (however, one of the Norwegian interviewees was of this opinion (Interview PNG6). Furthermore, in such a large country as China, it is clearly the case that many sustainable development initiatives are pursued outside the CA21 framework (most prominently, perhaps, China’s population control programme).

<sup>17</sup> Even though the word is of Greek origin, it has never been part of the Greek vocabulary, and only dates back to 1856.

<sup>18</sup> *Webster Dictionary*, Merriam-Webster Online, URL: <http://www.m-w.com/>.

also social systems, and thus power relations and cultural conditions may decide whether a particular environmental technology project is successfully implemented or not.

Therefore, it is necessary to base the argument on a broad definition of technology, as the *artefact*;<sup>20</sup> the *knowledge*<sup>21</sup> and *skills* needed to make, use, service and further develop it; the *organisational and institutional elements* needed in order for artefacts, knowledge and skills to be properly used;<sup>22,23</sup> and the *end product of the technology implementation process*.<sup>24</sup>

*Environmental technology* will in this thesis be taken to mean technology advancing sustainable development by avoiding environmental harm; minimising resource and energy use and thereby also waste; monitoring or assessing the state of the environment; controlling existing problems; and/or remediating or restoring past environmental damage.<sup>25</sup>

The concept of technology transfer suggests that the process of interest is one-way, that it includes a superior supplier/donor and a subordinate recipient, and that technology only consists of nuts and bolts that can be transported from the donor to the recipient. The technology transfer concept is also founded on the assumption of a linear process lasting from the search for and choice of technology, through utilisation and replication, incremental improvements and adaptation to local conditions, to fundamental changes and new solutions.

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<sup>19</sup> Apart from the SCOT approach and the classical economic approach, at least the following approaches can be discerned out (see e.g. Tjora 1997: 11-14). The *marxist approach* sees technology as forming part of a dialectical relationship between means of production (capital, technology) and society (Winner 1977, Feenberg 1991). The *functionalistic approach* regards technology as having certain (un-)intended consequences or (manifest/latent) functions (Merton 1968). The *structuralist approach* is based on an understanding of structure as rules and resources (Giddens 1984). This is related to the idea of technology as being both prescriptive and permissive – that is, both directing/correcting human actions, and extending current practices to new realms (Galegher and Kraut 1990, cited in Tjora 1997: 12). The *ethnographical approach* analyses technology as situated practice.

<sup>20</sup> Similarly, Edquist and Edquist (1979: 9) use the term “techniques for development”, understood as “material or physical elements in production: equipment, tools, instruments and machines” (see also Edquist (1980)).

<sup>21</sup> See e.g. Teece (1977), Perlmutter and Sagafi-nejad (1981), Rosenberg and Frischtak (1985), Burgelman and Maidique (1988: 32), and Metcalfe (1994, 1995).

<sup>22</sup> See e.g. Müller (1984), Goldhaber (1986), Street (1992), Lall (1993), and Granerud (1996).

<sup>23</sup> Some, among them Goldhaber (1986), Akrich (1992), MacKenzie and Wajcman (1985) and Tjora (1997), argue for including the use of technology in the definition of technology itself; however, such definitions, in my humble opinion, blur the distinction between an artefact and an actor making use of this artefact. Furthermore, including this dimension in the definition of technology does not make much sense in a study whose focus is on the implementation process *preceding* use of a given technology. Some also regard technology as a profession or a field of study. However, this meaning of the word seems less relevant in our discussion of technology co-operation. Therefore, it is not incorporated in my own definition of the concept. Technology is also often regarded as the application of scientific research (see e.g. American Heritage Dictionary, Dictionary.com), but the causal relationship may in many cases also be the other way around: technological breakthroughs resulting from incremental improvements may initiate research (personal communication with Atle Chr. Christiansen 1999). This confusion is illustrated by the fact that the web dictionary WordNet defines technology as both “the practical application of science to commerce or industry” *and* as “the discipline dealing with the (...) science of applying scientific knowledge to practical problems”. A good rule of thumb is that technology is concerned with change in the material environment, while the ultimate purpose of science is to understand nature, URL: <http://atschool.eduweb.co.uk/trinity/watistec.html> (25 July 2000).

<sup>24</sup> See e.g. Müller (1984), and Fransman (1984).

Thus, the concept of *technology co-operation* is used in this thesis instead of technology transfer (wherever possible), acknowledging that both partners in technology co-operation might learn from the process, and that this process can – and indeed should – involve partners of an equal standing (Heaton *et al.* 1994: vii, Martinot *et al.* 1997: 362-3). It is acknowledged that technology co-operation is a complex and rarely linear process, frequently including periodic setbacks and fundamental redefinitions. Most importantly, the concept acknowledges, as is the point of departure for this thesis, that it is fruitful to understand *technology* broadly (see above).

Technology co-operation may occur both across and within countries, and may involve a broad set of actors, including public and private sector entities, NGOs (non-governmental organisations) and research/education institutions (IPCC 2000). This thesis concentrates on the role of public entities within one of the countries taking part in international technology co-operation.

An inclusive definition of *implementation* will be used in this thesis, namely “the decision or process by which a particular innovation is introduced into society” (Street 1992: 19). Implementation for our present purpose thus should be taken to mean the decision and process by which technology for prevention and control of oil spillage at sea was introduced at the project site. This definition reflects that policy-making and implementation on China is not only authoritarian – which justifies a decision-oriented approach – but also fragmented, signalling that important dimensions may be lost unless implementation is studied from a process-oriented point of view as well. The concept of implementation *status* is employed because the project of study was not fully implemented at the time of study (see Sections 2.1 and 3.5 for more details).

An *organisation* is understood as a material entity, in contrast to an *institution*, which is regarded as a recognised pattern of behaviour (Young 1994:3). By *framework conditions* is meant the underlying structural characteristics of a society influencing its capacity to

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<sup>25</sup> Several types of technology may be regarded as subtypes of this definition of environmental technology. *Control technologies* render hazardous substances harmless before they enter the environment. *Remediation and restoration technologies* make harmful or hazardous substances harmless after they enter the environment. *Monitoring and assessment technologies* are used to monitor the conditions of the environment, including releases of pollutants and other natural or anthropogenic harmful materials. *Avoidance technologies* are technologies that avoid the production of environmentally hazardous substances or alter human activities in ways that minimise damage to environment.

implement a certain policy, i.e. the opportunity structure of the proponents of a particular policy.

#### **1.4 Outline of study**

In Chapter (Ch.) 2, the analytical framework is presented. It is mainly based on theories on environmental policy implementation in China. First, different approaches to the understanding of implementation status (the dependent variable) are discussed, and criteria for successful implementation suggested. Then, three framework conditions (independent variables) believed to influence the implementation of environmental projects in China are suggested: horizontal fragmentation, vertical fragmentation and relative organisational strength. On the basis of the elaborations on dependent and independent variables, hypotheses about organisational factors influencing the implementation of environmental technology projects in China are forwarded.

The study is directed towards explaining the *empirical* phenomenon of the implementation of environmental technology projects in China – or, rather, its limited extent. The challenge of a study this kind is to select independent variables helping to answer the empirical question, and to provide a thorough, theoretically based argument for the selection of these variables. Thus, in this study, theories are utilised eclectically to underpin the choice of explanatory variables, and the formulation of hypotheses. This, however, does not preclude a concluding analysis of the implications for theory development (see Ch. 8.2).

The case study method has been employed in collecting data for the thesis. Ch. 3 deliberates on the epistemological merits of this type of research design; criteria for the choice of case; methods of data collection; and cross-cultural challenges related to studies like this one. It finishes off with a discussion on the robustness of the study's findings to empirical and theoretical choices (in terms of reliability, construct validity, internal validity and external validity, respectively).

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These categories may also be regarded as stages in environmental technology development. See U.S. White House (1994, 1995) and Brattebø (1997: 13) for detailed discussions on the matter.

Ch. 4, the first empirical chapter, provides an introduction of the case study, CA21 Project 6-8.<sup>26</sup> The main part of the chapter consists of a description of Project 6-8 according to the effectiveness criterion for successful project implementation suggested in Section 2.1.

Ch. 5 is the second empirical chapter. It documents the values on independent variables (organisational framework conditions) employed in the thesis (horizontal and vertical fragmentation, and relative organisational strength, respectively), according to the indicators specified in the analytical framework.

In Ch. 6, the empirical analysis, the relationship between the above-mentioned organisational framework conditions and the implementation status of the Project 6-8 will be explored, taking the analytical framework in Ch. 2 and the empirical documentation provided in Chs. 4 and 5 as points of departure. Based on a discussion of the balance between structure and agent perspectives in analyses of policy implementation – as well as fragmentary empirical material – the chapter also suggests integrating actors' strategies with organisational framework conditions in a broader analytical framework, where the influence from framework conditions is mediated through actors' strategies in the implementation of a particular project.

Based on the analysis of the implementation process of CA21 Project 6-8 until mid-1999, Ch. 8 summarises the main characteristics of domestic organisational conditions believed to influence the implementation of environmental technology projects in China. A short note on the prospects of China's Agenda 21 follows, as well as a set of suggested success factors for the implementation of environmental technology projects in China. Following this is a short reminder of the implications China's "Western development strategy" and its World Trade Organisation (WTO) accession will have for the implementation. Then follows some implications from the implementation process of Project 6-8 for greenhouse gas abatement projects in China and other countries in the South related to the Clean Development Mechanism under the Kyoto Protocol. The chapter ends with some thoughts on what implications new types of environmental technology will have for the organisation of development aid, inspired by Project 6-8.

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<sup>26</sup> Appendix 10.3 contains a short overview of China's sustainable development challenges and its follow-up of the global Agenda 21 through implementing China's Agenda 21. While it is not necessary to read to understand the empirical documentation and analysis, this appendix may serve as an introduction and background to these chapters.

Ch. 8.2 focuses on which implications the study has for research on environmental technology policy implementation in China. Secondly, the possibilities of linking research on international environmental commitments and domestic environmental technology politics are explored, based on the agent-structure debate.

“The real worry of the world is not that we do not have enough laws and regulations, but that the laws and regulations are not carried out assiduously.”

*Chinese aphorism*

## **2 Analytical framework: Explaining implementation – a multidisciplinary approach<sup>27</sup>**

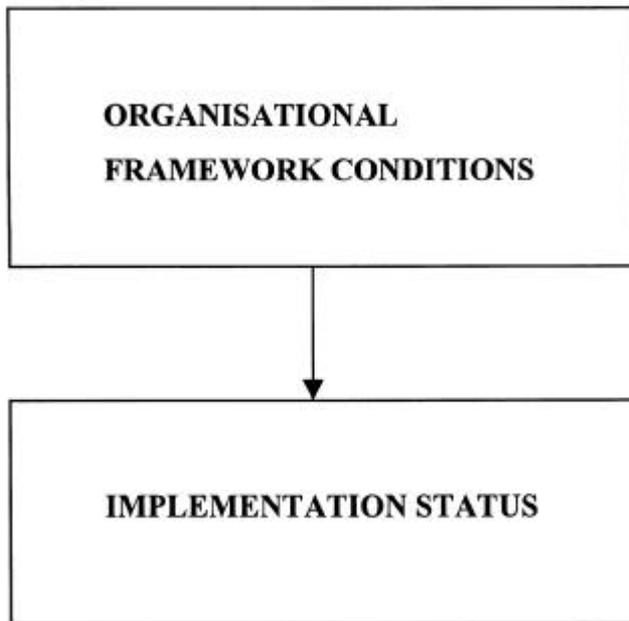
This chapter suggests an analytic framework within which to understand organisational factors influencing the implementation of environmental technology projects in China, and the implementation status of CA21 Project 6-8 in particular. Key concepts are operationalised, and arguments forming the basis of hypotheses are presented. The arguments are multidisciplinary in the sense that they are derived from a broad range of theories on environmental policy implementation in China. This is based on the belief that assumptions about factors influencing implementation must be based not only on general theories, but also on theories specifically addressing the organisational, institutional, technical, economic and cultural characteristics of the socio-technical system of study, and on empirical studies of this system.

The chapter starts out with a clarification of the dependent variable, *implementation status*. This discussion also includes a definition of when implementation status should be judged successful or unsuccessful, respectively (see below). Following this, three types of organisational framework conditions believed to influence the implementation status of Project 6-8 are distinguished, and causal pathways through which this influence may take place are proposed (see Section 2.2).

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<sup>27</sup> A rudimentary version of the analytical framework was presented as Buen (1999). A later version of the chapter has been presented as Buen (2000e). Parts of the analytical framework have also been used in Buen (2000d).

**Figure 2.1 Preliminary causal model**



***2.1 Defining and operationalising the dependent variable: Aspects of implementation***

On the surface, policy implementation seems straightforward, if not downright banal. A legitimate public body formulates policy goals, specifies criteria as to how these goals are to be reached, and requests an agency to organise a program for practical implementation of the policy. This agency, in turn, identifies program objectives, specifies measures to be undertaken, acquires funding and other relevant resources, and decides which activities are to be carried out by whom.

Nevertheless, projects and programs continue to yield outcomes diverting from initial goals – if they are implemented at all – taking more time than planned, or costing more than expected in terms of money and other resources. Theories of policy implementation aim to explain why policy outcomes so often are at odds with what policy designers intended.

As the definition of implementation is central to the debate between different approaches to implementation theory, there are almost as many suggestions as to what implementation should

mean as there are researchers studying the phenomenon.<sup>28</sup> Van Meter and van Horn's (1975: 447-8, emphasis added) view that "policy implementation encompasses those actions by public or private individuals (or groups) that are directed at the achievement of objectives set forth in prior policy *decisions*" is widely cited. Najam (1995b: 31, emphasis added), on the other hand, defines implementation as "[a] dynamic *process* of negotiation between multiple actors, operating at multiple levels, within and between multiple actors" (a concise definition of implementation adapted to this particular study is given below).

*Implementation* should be distinguished from *compliance*. While implementation refers to *intentional* follow-up of commitments and policy initiatives, compliance covers all implemented policies that *coincide* with commitments, regardless of whether this is a result of political intentions or external factors as economic recession or technological development (Rosendal 1999: 15-16).<sup>29</sup>

Domestic policy implementation can be categorised into three stages (Rosendal 1999: 17): output, outcome and impact. Implementation *output* is policies, programs, laws, regulations, and institutions that governments employ in contending with policy problems. Implementation *outcome* refers to the enforcement of these policies leading to corresponding behaviour change in target groups at sub-national level, while *impact* means genuine environmental problem solving.

This study concentrates upon implementation outcome. However, the analysis will necessarily be deeply influenced by implementation output. Whether sub-national target groups alter their behaviour to a large extent depends on the content of national policies and the organisational context in which they are being enforced, in this case through the process of formulating and implementing the CA21 programme. As the process of implementing A21 is still in its infancy, also in China, it is too early to study impact. Furthermore, studying impact requires natural science expertise.

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<sup>28</sup> This unfortunately limits the scope for a comparative conclusion of this study. However, for a thorough and systematic summary of the debate on implementation, see Najam (1995b).

<sup>29</sup> The reader should note that there is disagreement in the literature on the relationship between compliance and implementation. For example, Brown Weiss and Jacobson (1999: 18) claim that "compliance goes beyond implementation" because "it refers to whether countries in fact adhere to the agreement's provisions and to the implementing measures that they have instituted". They also distinguish compliance from effectiveness, as "[a] country may comply with an agreement but the agreement may nonetheless be ineffective at achieving its objectives" (see also footnote 36).

The vast amount of literature on policy implementation relevant for the study of environmental policy implementation in China includes at least:

- General literature on policy implementation, mainly concerned with public policy implementation in liberal-democratic countries in the North.<sup>30</sup>
- Literature concerning environmental policy implementation in particular – again mostly focusing on liberal-democratic countries in the North.<sup>31</sup>
- Literature on public policy implementation in the former Communist countries and the South.<sup>32</sup>
- Literature on policy implementation in China, including some contributions focusing on environmental policy implementation in particular.<sup>33</sup>

This study will mainly focus on the latter category, since the contributions in this category largely build upon studies in the former three categories, and have adapted these insights to a uniquely Chinese context.

Traditionally a line has been drawn between “top-down” and “bottom-up” perspectives on implementation. However, Kjellberg and Reitan (1995: 132) argue that these labels accentuate ideological and normative differences at the expense of the analytical. They suggest an alternative distinction, namely between “decision-oriented” and “process-oriented” approaches. The differences between the two approaches are illustrated in the table on the next page:<sup>34</sup>

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<sup>30</sup> See e.g. Pressman and Wildawsky (1973), Van Meter and van Horn (1975), Hjern and Porter (1981), Mazmanian and Sabatier (1981, 1983), Sabatier (1986), Weale (1992a), Najam (1995b), Underdal (1995), and Skjærseth (1999).

<sup>31</sup> Surprisingly enough, there are very few studies specifically concentrating on the implementation of environmental policy in the developed world – however there are a large number of studies treating subjects that are closely related to this topic. See e.g. Jänicke and Weidner (eds.) (1995), Weale (1992a), and Vogel and Kuhn (1987).

<sup>32</sup> See e.g. Grindle (ed.) (1980), Wildawsky (1982), Migdal (1988), Triantafillou (1995), and Rosendal (1999).

<sup>33</sup> See footnote 9.

**Table 2.1 Dimensions of difference between decision-oriented and process-oriented approaches to implementation**

DIMENSION OF DIFFERENCE	DECISION-ORIENTED APPROACH	PROCESS-ORIENTED APPROACH
Definition of implementation	Narrowly: phase between central-level decision and local operationalisation.	Broadly: total politico-administrative process related to a programme or policy.
Empirical departure	An authoritative decision.	Decision as part of larger context of political processes related to relevant problem area(s) or target group(s).
Organisational setting of implementation	Stable structures, formal relations of authority and institutionalised decision-making processes.	Informal structures and interorganisational networks between actors of equal status.
Perspective on implementation process	Direct control by top-level units over their subordinate units viewed from the perspective of the initial policymakers in the <i>centre</i> .	Adaptation through negotiations and compromise.
The importance of setting goals	Important to formulate clear goals that all relevant actors know about and agree upon.	Goals may be formulated, and changed, according to means at disposal.
Aspects of implementation process stressed	Characteristics of the implementing organisation(s), procedural aspects.	Behavioural aspects.
Criteria for successful implementation	Degree of correspondence between goals and local arrangements.	Degree of correspondence between intended social change and ability of policy to promote this change.
Main goal of research	Understand what contributes to effective public policy and management.	Understand how to successfully obtain practical adaptation of public policies.
Typical criticism	<ol style="list-style-type: none"> <li>1) Goals intentionally formulated vaguely, to resolve conflicts later through compromise.</li> <li>2) Decisions often made even though necessary information lacking.</li> <li>3) Policy often symbolic purpose.</li> <li>4) Due to need to/wish for decentralisation, state non-interference or weak central state apparatus, lower administrative levels or non-governmental actors often given authority to clarify goals.</li> <li>5) Too focused on formal decisions. Elite bias.</li> <li>6) The objectives of granting implementers extensive decision making authorities <i>and</i> distinguishing clearly between decision and its implementation, are irreconcilable.</li> </ol>	<ol style="list-style-type: none"> <li>1) Lack of focus on authoritative decisions may blur the origin of the policy implementation process studied.</li> <li>2) Focus on the informal and spontaneous veils how organisational and institutional characteristics define relations between actors and their possibilities for action.</li> <li>3) Deliberate aspect of implementation is lacking – hard to distinguish implementation from compliance.</li> <li>4) Hard to distinguish analytical arguments from normative recommendations (e.g. decentralisation, flat decision making structures) – theory’s contenders rarely discuss this.</li> </ol>

*Adapted from Kjellberg and Reitan (1995: 162).*

<sup>34</sup> The typology is rather broad-brushed. Thus, few theoretical contributions will fall neatly into the specified categories. Nonetheless, it is believed that the differentiation is useful. While the table is adapted from Kjellberg and Reitan (1995: 162), it is also based on the reading of important decision-oriented contributions (Pressman and Wildawsky 1973, Van Meter and Van Horn 1975, Sabatier 1986), as well as contributions taking a more process-oriented view (Fudge and Barrett 1981, and Hjern and Hull 1982).

Thus, both approaches have obvious advantages as well as clear drawbacks. Therefore, the best solution seems to be to choose factors eclectically from the two approaches in a balanced way, as Kjellberg and Reitan (1995: 165) suggest. The empirical focus of the study also merits such an approach.

Since this study aims to delineate organisational factors explaining the outcome of a particular project, project implementation from central level decision to local operationalisation will be analysed. However, as decisions have a somewhat different status in Chinese politics than in politics in the countries in the North, it will be analysed more in terms of processes than single, authoritative decisions. Perhaps surprisingly, given China's authoritarian traditions, the analysis will combine elements of top-level control on the one hand and fragmentation, negotiation and compromise on the other. As regards criteria for successful implementation, a compromise between the two approaches is sought as well (see also Ch. 3).

Thus, the definition of implementation provided by Street (1992: 19), namely "the decision or process by which a particular innovation is introduced into society", seems to be most appropriate for the focus of this thesis. Policy-making and implementation in China is not only authoritarian – which justifies a decision-oriented approach – but also fragmented, signalling that important dimensions can be lost if implementation is not studied from a process-oriented point of view as well (see also Section 2.2.1). The definition not only balances the decision and process approaches to implementation, however. It also incorporates the re-innovation aspect of international technology co-operation (see Section 7.2.2 below). Implementation for our present purpose should thus be taken to mean the decision and process by which technology for prevention and control of oil spillage at sea has been and is introduced in Project 6-8.

There exist no agreed-upon general criteria for evaluating whether implementation output or outcome has been successful or not – even less so in countries in the South (Morell and Poznanski 1985: 151-152, Jänicke 1997: 2, Rosendal 1999: 18). Bartlett (1994: 184) notes that success and failure in environmental policy "are wholly dependent on their terms of reference for meaning, and dangerous in their potential for abuse". Different actors in a particular implementation process will emphasise different criteria for successful implementation. Thus, such an evaluation will inevitably be subjective, and its results will depend on which factors (e.g. environmental, economic, social, or political) are given priority.

However, the following set of criteria for successful environmental technology co-operation projects are often mentioned in the literature (Enos and Park 1988: 12-14, Aase 1989, Berlage and Stokke 1992: 5-6, Ho 1997: 87, Dale 1998: 41-45):<sup>35</sup>

- *Effectiveness*: Comparing project implementation status so far with originally stated project objectives (in this case, in PPCA21 1994), and examining to what extent the planned outputs and expected effects (immediate objectives) are being or have been produced or achieved (Dale 1998: 42).<sup>36</sup>
- *Efficiency*: The amount of outputs created and their quality in relation to the resources (money, equipment, materials, expert advice, personnel) invested in the project, and the distribution of these investments.<sup>37</sup> Has the project been implemented within the agreed time and budget limits, and have the investments been distributed between the implementing actors as stated in the project description?<sup>38</sup>
- *Relevance*: To what extent the programme or project is or has been addressing problems of high priority, seen mainly from the stakeholders' point of view. Could the resources spent on the project have been spent on alternative and more advantageous purposes?
- *Sustainability*: What is the likeliness of the maintenance or increase of positive changes induced by the project after foreign financial, organisational and technical support has been terminated (e.g. operation and maintenance of physical facilities; the carrying out of particular management tasks; or adapting, changing and improving technology)? To what extent is it feasible to replicate the project or parts of it in another context (at a later time, somewhere else, or for other groups of people) (Oldham *et al.* 1987, Aasen 1988)?

Analysing how all four of these aspects of successful implementation relate to each of the three independent variables specified later on in this chapter, is impossible within the limits of this

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<sup>35</sup> Yet other criteria for successful implementation may be found in the literature, e.g. the assumptions underlying project implementation, and externalities (personal communication with Regine Andersen, researcher, the Fridtjof Nansen Institute, 29 November 1999). Furthermore, some studies suggest separate criteria for sustainability and replicability (see e.g. Dale 1998).

<sup>36</sup> It is of course possible that project objectives are reached because of other factors than the specified outputs, but these are disregarded in this study. Dale also includes intended impacts (development objectives) in his definition of effectiveness. However, as this study focuses on outcome and not impacts, assessing this would be outside the scope of this thesis. Interested readers should also confer the debate on the effectiveness of international environmental regimes (see e.g. Wettstad (1995, 1999), for overviews). However, definitions of international regimes – and the effectiveness of such regimes – vary, and some include implementation as well as compliance among the categories of effectiveness criteria (Wettstad 1995: 6-7).

<sup>37</sup> The problem, of course, is to decide the amount reasonable to produce the documented outputs, as such criteria are scarcely provided in the project plan documents (Dale 1998: 42).

<sup>38</sup> The importance of rapid implementation should be weighed against possible benefits from longer projects in terms of organisational learning and a correspondingly increased future capacity to innovate (Ho 1997: 87-88).

study. As indicated in Section 1.3 above, because Project 6-8 was not finished by the time the fieldwork for this analysis was concluded, the independent variable of the study is implementation status as of mid-1999, when the fieldwork was ended (see also Section 3.5 below). Therefore, it would seem overly speculative to assess whether the overall project implementation results correspond to the amount of resources spent (efficiency) – even though this is often accepted in evaluations of development aid projects (Dale 1998). Although relevance should be regarded as a very important criterion of successful implementation, it is difficult to analyse the case project in terms of its relevance. This would have required a very different type of methodology, namely personal interviews with local stakeholders – mostly in Chinese. This would have been very costly and would have required a longer fieldwork. Assessing sustainability will always consider future developments, and thus necessarily involve a certain amount of speculation, but was too speculative to include as a separate indicator at the time the case study was conducted. Furthermore, the difference between effectiveness and sustainability becomes somewhat unclear in cases such as Project 6-8, where the sustainability and replicability of the project is among the main planned outputs.

The most well-defined and manageable indicator for successful implementation status in this study therefore seems to be assessing whether planned outputs and expected effects of Project 6-8 (stated in PPCA21 1994), are being or have been produced through the actual implementation of Project 6-8. Thus, in the empirical overview, the project implementation process so far will be assessed solely according to the criteria of implementation *effectiveness*. It should be noted that there are a number of methodological questions related to such a choice, which will be elaborated upon in Ch. 3 below.

## **2.2 Clarifying the independent variables: Three organisational framework conditions**

Outlined below are three organisational framework conditions believed to influence implementation of environmental technology projects in China, and the CA21 Project 6-8 in particular:

- horizontal fragmentation,
- vertical fragmentation, and

- the relative strength of relevant governmental actors.<sup>39</sup>

According to Jänicke (1997: 8), “the capacities for the environment are constituted by the strength, competence and configuration of organised governmental and non-governmental proponents of environmental protection and (...) framework conditions”. He operates with three main categories of such framework conditions, meaning “factors that determine the relevant actors’ opportunity structure”. *Cognitive/informational framework conditions* describe the conditions under which environmental knowledge is produced, distributed, interpreted and applied.<sup>40</sup> *Economic and technological framework conditions* include economic performance, technological standard, sectoral composition (state vs. private), access to raw materials, financing and ability of capital, the pricing of natural resources, intellectual property rights and patent policies, and scientific and technological education. *Political-institutional framework conditions* describe “the constitutional, institutional and legal structure, the institutionalised rules and internalised norms, constituting the framework for interaction” (Jänicke 1997:7).<sup>41</sup>

Dictionaries define “framework” among other things as “an underlying structure supporting something else”. “Condition” can be defined as “that which must exist as the occasion or concomitant of something else”, or “that which is requisite in order that something else should take effect”.<sup>42</sup> However, these definitions are imprecise, as they suggest that framework conditions are both necessary and sufficient conditions for the successful implementation of environmental policy. Rather, each of the framework conditions should be understood as necessary, but not sufficient, conditions for a programme or policy to be implemented. Even positive values on all framework conditions specified in this thesis would not guarantee a successfully implemented programme or project. The reason is that, as technology and competence utilised in environmental projects and programmes is rarely from China only, their success is also very often dependent on conditions in donor countries and in the international economic system (see Ch. 1).<sup>43</sup>

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<sup>39</sup> The sections containing the arguments on which the two first-mentioned variables are based, will necessarily be more extensive than that containing the third. The reason is that these chapters both provide necessary background information for the reader and together provide an overview of the Chinese political system on which the third variable is based.

<sup>40</sup> For analyses of the increasing impact of cognitive-informational framework conditions on Chinese energy-environmental policy, see Buen (1998a, 1998b).

<sup>41</sup> There is a growing literature focusing on “barriers” for environmental technology. However, the barrier concept in my opinion has an element of prejudice to it. The term “framework condition” is more balanced, as it does not preclude the possibility that a certain factor may both act as a dynamic force in – and a barrier to – policy implementation. For an excellent overview of theories of barriers to energy-environmental policy initiatives, although mainly focusing on energy efficiency, see Weber (1997). He distinguishes between institutional, organisational, market and behavioural barriers, but points out that in practice, every “real life” barrier incorporates elements of all the above.

<sup>42</sup> Webster’s Revised Unabridged Dictionary (1998) cited in Dictionary.com, URL: <http://www.dictionary.com>.

I choose to divide Jänicke's term "economic-technological framework conditions" into two terms, namely technical and economic framework conditions, respectively. Combining e.g. economic performance and the financing and ability of capital with technological standard seems analytically imprecise. Furthermore, as technology has been defined as encompassing organisational elements, using the category "technological" *as well as* organisational framework conditions (see below for elaboration of this term) would have been problematic.

One of the characteristics of China's political system is the personalisation of politics and the meshing of politics and administration (see e.g. Pye 1995b, and Ch. 6). Therefore, although unintended, Jänicke's term "political-institutional framework conditions" seemingly fits the characteristics of the Chinese political system pretty well (in analyses of political systems where a relatively clear line can be drawn between politics and administration, and between the political and the private, this would not have been the case). Nevertheless, I have chosen to employ the term "organisational framework conditions" instead, as indicated above.

While refraining from ending up in endless debates of organisation theory or institutional theory, there are three reasons for this change: first, the organisational aspects of policy implementation are in my opinion not reflected in the term as it originally stands. Secondly, the term "political" is vague. The political has been taken to mean everything from all social relations involving power, rule and authority, to public decision-making and the framework guiding the actions of individuals and groups towards public decisions (Østerud 1993: 15). A third point, closely related to the first, is that the term "political-institutional framework conditions" does not adequately separate the political (actors and their strategies) from the frameworks defining it (structure). According to dictionaries, the term "political" may be interpreted both as "dealing with the *structure* (...) of government, politics, or the state"; as "relating to (...) [or] *involving* (...) *politicians*"; or as "relating to (...) the *making as distinguished from the administration* of governmental policy".<sup>44</sup> Employing this framework, proponents of a given environmental policy would have a hard time deciphering the difference between the strategies of their opponents and the political framework conditions they are supposed to be a result of. Using the term "organisational" instead may reduce this problem.

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<sup>43</sup> Another reason why framework conditions are treated as necessary but not sufficient variables, is that there are also other types of domestic variables that are essential to integrate in more comprehensive analyses than this study (see Section 0 below).

<sup>44</sup> The first two interpretations are taken from *Dictionary.com* (2000), and *The American Heritage Dictionary of the English Language* (1992), while the last is taken from *Webster Dictionary* (2000). The italics are mine.

Institutions should be understood as persistent and connected sets of formal or informal rules, habits, constitutions, laws, conventions and/or codes of conduct defining and constraining social practices through assigning roles to – and structuring the interactions among – the participants in these practices (Young 1982: 18, 1994: 3, Haas *et al.* 1993: 4-5, Scott 1995: 33, Schreurs and Economy 1997: 4).<sup>45</sup> An organisation, on the other hand, “is a material entity possessing attributes such as office, personnel, a budget, equipment and so forth” (Young 1994: 3). Contrary to institutions, organisations are agents that have preferences and objectives (Khalil 1995). It is therefore sensible to make a distinction between organisational framework conditions on the one hand, and institutional such on the other.<sup>46</sup>

Jänicke’s categorisation of framework conditions seemingly faces other validity problems as well. It seems difficult to analyse the strength of proponents of environmental policy as a separate variable, isolated from the three categories of framework conditions. The reason is that it is not meaningful to analyse the strength of an actor without taking into account the relative strength of other actors (see Section 2.2.3 for further elaboration). Furthermore, Jänicke chooses to distinguish between capacity and the utilisation of this capacity, and treats actors’ strength as part of capacity while actors’ will and skills are treated as part of the utilisation of this capacity. Admittedly, the strength of an actor can be documented in a meaningful by concentrating on other elements than its wills and skills – as is the case in this study; however, it does not seem possible to exclude wills and skills from a definition of relative organisational strength as such. Thus, I choose to regard the relative strength of relevant administrative actors as part of organisational framework conditions.<sup>47</sup>

Apart from framework conditions, strategies and actors’ strength, Jänicke includes two other factors – the structure of the environmental problem at hand, and the situational context – in his framework. As was the case with the strength of relevant actors, it is hard to see how these two

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<sup>45</sup> The weakness of this definition is that it does not incorporate the fact that actors’ actions in turn influence structures (institutions). However, as this study is only focusing on the influence of organisational-institutional framework conditions on strategies, and, in turn on project implementation, and not the feedback on structures from actors’ actions, this does not constitute a problem for our purpose.

<sup>46</sup> Admittedly, such a distinction would also be vulnerable to the criticism that such a categorisation makes it hard for actors to distinguish between the strategies of their opponents and the political framework conditions these strategies are supposed to be a result of. According to Jänicke (1995: 8), institutions encompass “routinised rules and internalised norms”; however, norms and rules may often be hard to distinguish from actors’ strategies – especially if they are of a long-term character, as Jänicke prescribes. Furthermore, the distinction between cognitive/informational framework conditions and institutional framework conditions would also need to be defined more clearly in order for the framework to become more internally consistent. However, this does not pose a serious problem in this thesis, as all independent variables are organisational framework conditions.

variables are separated analytically from the three (or, in my case, five) categories of framework conditions. This could perhaps have been possible (if not very practical), had Jänicke distinguished clearly between framework conditions on a very general level, and situational context and structure of the problem on a very specific level. However, he leaves the reader to decide where to draw the line between either of these two factors and framework conditions. For example, can an environmental problem be of an organisational and/or institutional character, or should it only be defined in terms of impact on nature? If the latter is correct: is this impact man-induced? If so: how can organisational and institutional aspects be excluded from the problem definition? Or is the problem of a technical nature? etc. In the case of climate change or transboundary pollution, treating the structure of the problem as a separate variable has some merit. On the other hand, if the structure of a problem refers to the fact that it is of a transboundary character, what exactly is the problem? Is it only the fact that pollution spreads over a large area, or is it also the fact that this area is divided by man-made borders?

Similarly, defining the situational context as a separate variable may be useful when analysing unique crises, e.g. a blow out, or an oil spill accident. In our case, there is no such specific situational context to analyse, as an implementation *process* is studied. Therefore, in this study, it is deemed more sensible to include these factors in the “framework conditions” category. After all, the *raison d’être* of a model is its simplicity.

### 2.2.1 Horizontal fragmentation

Environmental problems often affect a broad range of actors in society, and the remediation of such problems may demand action from yet other actors. Compartmentalised administrative apparatuses thus often do not match the comprehensive nature of environmental problems (Weale 1992a: 52-53, Andresen *et al.* 1995: 48).<sup>48</sup> Jänicke (1997: 14) highlights that environmental policy innovation is enhanced by “a co-operative policy style” and that “if the environmental policy goal is grounded in a broad consensus, implementation will be easier and more successful”. Andresen *et al.* (1995: 47-48) assume “inter-ministerial power and interest

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<sup>47</sup> There are two additional problems with Jänicke’s categorisation, although of less relevance to this study. The first is whether research and development within e.g. political science should be included in the category of organisational framework conditions, or if all research and development should be placed in the category economic-technological framework conditions. Further complicating the problem is the fact that it is very hard to make a clear distinction between research on the one hand and administration on the other in China (Buen 2000d). The second is that it remains unclear whether fiscal policies affecting the implementation of environmental technology projects in China should be included in the political-institutional or the economic-technological category.

struggle” to be central in explaining implementation differences, and argue that implementation proceeds more smoothly when all or most of the relevant ministries have taken part in policy formulation.

I suggest to modify the assertion about the importance of organisational participation somewhat in the case of China: the more relevant actors included in policy formulation, the better the chances of successful policy implementation, but the lesser the chance for the policy to be implemented without many modifications, due to fragmentation, bargaining and consensus-building. Moreover, while China no longer fits the description of a centrally planned economy in all regards, the top leadership is still in many cases perfectly able to implement very controversial policies if it makes a determined drive to do so.<sup>49</sup>

There is a consensus among analysts that there is a large “implementation gap” in Chinese environmental policy (Ross 1984, 1987, 1988, Ross and Silk 1987, Chan *et al.* 1995, Jahiel 1997, Zheng and Qian 1998).<sup>50</sup> The difference between national goals as specified in laws and regulations and actual policies is wide. A consensus seems to exist among researchers of Chinese politics that the fundamental reason is that the Chinese governmental structure is too fragmented (Lieberthal 1997). Politics and administration in China is characterised by the co-existence of a very strong power elite that meets few formal constraints in the form of laws or institutions, and an extremely complex organisation of power on lower administrative levels. The duplication of both Party and government structures on all levels of the Chinese bureaucracy creates a complex matrix where authority is fragmented along vertical (functional) bureaucracies and horizontal (territorial) co-ordinating bodies.<sup>51</sup>

New policy initiatives affect a myriad of bureaucratic actors with vaguely defined and sometimes overlapping jurisdictions, conflicting interests, and complex, distinct structures of authority (Lampton 1987a, b, Lieberthal and Oksenberg 1988, Lieberthal 1992, Lieberthal and Lampton (eds.) (1992), Economy 1994, Lieberthal 1995, Gan L. 1998). All have to be consulted and supportive if policies are to move forward (Livernash and Mock 1994, Zhao 1995). Key decisions are therefore often a result of a *series* of reinforcing compromises made

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<sup>48</sup> This aspect could perhaps be studied taking the structure of the problem as the point of departure as well, cf. the discussion above, but this falls outside the scope of this thesis.

<sup>49</sup> The gigantic Three Gorges dam project is a prominent example.

<sup>50</sup> A translation of Zheng and Qian’s very interesting book is available at the web site of the U.S. Embassy in Beijing (see U.S. Embassy Beijing 1999b)

in a number of only loosely co-ordinated decision-making bodies over a long period (Lieberthal and Oksenberg 1988). The result is that any major project or policy requires a gradual and protracted process of consensus and alliance building among competing bureaucracies at each level to gain support both vertically and horizontally in the bureaucratic system.

This problem is aggravated by the fact that the rising generation of younger leaders derive most of their power from bureaucratic rank within a particular multi-layered, functionally defined, vertically integrated system (*xitong*), and not from revolutionary deeds in the period before 1949 like their predecessors. Therefore, the new generation may have less personal power vis-à-vis bureaucratic interests than do elders. Thus, only incremental policy changes are possible.

However, each organisation, having its own agenda and world view (Fingar 1987, Ross 1988: 23), generally proceeds independently. It continuously negotiates and builds alliances both upwards and sideways in the system, collects and protects its own information (Halpern 1992), and creates its own programmes (Lieberthal and Oksenberg 1988, UNDP 1993, Lieberthal 1995:169, Lieberthal 1997).

Bargaining and consensus building is claimed to be especially true of funding issues, cross-sectoral issues and issues that are highly complex (Ross 1988: 191). The complex, competitive and cross-sectoral character of environmental technology policy in China should therefore make it more prone to bargaining than most other sectors. As is the case for any other country, Chinese environmental technology policy involves struggle to reconcile environmental and developmental goals. It is also an arena for an intense struggle for foreign financing – and the status attached to it – between several cash-strapped bureaucratic sectors.

One territorial level contains within it several bureaucratic ranks. A unit cannot issue binding orders to another unit at the same bureaucratic rank, not even if it is at a higher territorial level. China's State Environmental Protection Administration (SEPA), for example, heads *xitong* of Environmental Protection Bureaux (EPBs) in each of China's thirty-one provinces (including three municipalities), more than six hundred cities (of which the case project site is one), and over two thousand counties. Even some of the about one hundred thousand townships, not to

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<sup>51</sup> This "matrix problem" also forms an important part of the problem of vertical fragmentation (see Section 2.2.2 below), but it is treated mainly in this section, for the sake of chronology.

mention the more than one million (!) villages, have EPBs. However, as a ministry, SEPA has the same rank as the government of a province, and therefore must ask the State Council (the highest level of the central government) or a supraministerial commission (the second highest level of government) to give orders to provinces.

Because of the fragmentation of authority, it is very often necessary to achieve consensus among several bureaucratic bodies, of which none has authority over the others. Each territorial unit still has considerable power to control the unit one level down; therefore, bureaucrats at every level spend a lot of time negotiating for more flexibility. This means that there are numerous reporting lines throughout the system – through party, functional as well as territorial organs – with resultant problems of governance, or what Lieberthal (1995: 169) calls *fragmented authoritarianism*.

The fragmented authoritarianism approach to the analysis of Chinese politics owes much to Allison's (1969, 1971) explanation of the Cuban missile crisis from a bureaucratic politics point of view (Christiansen and Rai 1996). This approach is attractive for a study of policy implementation in China not only because it explains how institutions work and decisions are made, but because it draws upon China's strong bureaucratic traditions.

Allison analyses how standard operating procedures and bureaucratic structure constrain decision making, and challenges the notion that a URA model fully describes the forces shaping the making and implementation of policy. The central idea of Allison's bureaucratic (or governmental) politics model is that governmental decisions and actions are not chosen by rational, unitary actors; they are rather products of compromise, conflict and confusion – or, in one word, *bargaining*.

Allison's models were originally constructed to further the understanding of foreign security policy. While foreign security policy (and especially the Cuban Missile crisis) is “high politics”, environmental politics usually is considered to be within the realm of “low politics”.<sup>52</sup> Allison (1971: 276) acknowledges that *Essence of Decision* is “biased by focusing on this high-level crisis rather than on the more routine behaviour of governments”. However,

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<sup>52</sup> Climate politics, directly targeting the greenhouse gas emissions of national key industries and the transportation sector, may be an exception in this regard.

to a larger extent than Allison's other two models,<sup>53</sup> the bureaucratic politics model analyses the *domestic bureaucratic politics* of foreign policy (Allison 1971: 258, 276). Furthermore, the author himself acknowledged the possibility of – and the need for – applying his models to “other areas of public policy” (Allison 1971: 272).<sup>54</sup> Therefore, there are few reasons *not* to seek inspiration from Allison's bureaucratic politics model in constructing theories of Chinese environmental politics.

The fragmented authoritarianism approach also has a bias towards high politics. It has only to a very limited extent been tested in other functional areas of Chinese politics than the economic, or, more precisely, large investment decisions. This is partly due to the fact that such decision making processes are more accessible for foreign researchers, and the results more tangible (Lieberthal 1992: 5). The most prominent example is Lieberthal and Oksenberg's (1988) research on the decision making process relating to the building of the Three Gorges Dam. However, this study also touches upon environmental politics. Furthermore, Lieberthal's 1997 study of structure and process in environmental politics has indicated that the model is applicable in this area as well.

A number of other explanatory models in Chinese politics exist,<sup>55</sup> but fragmented authoritarianism is generally acknowledged, perhaps especially within the field of policy implementation. The model is challenged on theoretical grounds mainly in terms of the degree of centralisation ascribed to the Chinese political system. This critique comes from two different directions, namely the bureaucratic and the market-oriented, leaving fragmented authoritarianism in a middle position.

Hamrin and Zhao (1995) find that the theory of fragmented authoritarianism overstates the weakness of the centre in describing delegation of authority as an uncontrolled process. They prefer the term “bureaucratic authoritarianism“, as this in their opinion describes better the Chinese Communist Party's (CCP) attempt to incorporate all organisations in society in the party-state structure, claiming unlimited authority.

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<sup>53</sup> The Unitary Rational Actor model and the Organisational Process model, respectively.

<sup>54</sup> Perhaps another reason why Allison's models have formed the foundation for theories of structure and process in Chinese politics is that Allison explicitly refers to Sinology (the study of China and the Chinese) in the first chapter of his book (Allison 1971: 23-24).

<sup>55</sup> Brødsgaard (1989), Zhao and Hamrin (1995), Christiansen and Rai (1996) and Dittmer (1996) all offer well-written and brief introductions to other models employed in research on Chinese politics throughout the Mao and Deng periods, including totalitarianism, factionalism, two-line struggle, clientelism, interest group politics, political culture, tendency analysis, and civil society, respectively.

Lester Ross (1984: 489-95, 1988: 1-24), on the other hand, places more emphasis on the emerging role of the market in environmental policy implementation. He distinguishes between three implementation alternatives that all have been employed in Chinese environmental policy. *Bureaucratic-administrative implementation* shares much of the observations and analyses of fragmented authoritarianism.<sup>56</sup> As Ross points out himself, *ideological campaign implementation* has been weakened in the post-1978 reform period (see also Zhang 1999). On the contrary, Ross sees a growing understanding and usage of *regulated market implementation*, at the expense of campaigns and state intervention, implying that a limited scope of economic decision-making is transferred from government and Party planning offices to households, private enterprises and other local actors.<sup>57</sup> Nevertheless, he emphasises that the Party ultimately decides whether the role of markets in implementation should increase, and that such decisions require “strong, unified leadership to prevail against inertial forces” (Ross 1988: 22).

Based on the insights from the literature on environmental policy implementation in China, and particularly the theory of fragmented authoritarianism, the following empirical proposition will be investigated in the empirical analysis to follow:

**Hypothesis 1: The more horizontally fragmented authority is among the governmental actors involved in the implementation of Project 6-8, the less likely it is that the implementation status of the project is positive.**

It is the task of the empirical chapter to substantiate whether authority among relevant bureaucratic actors in fact has been horizontally fragmented, and the task of the empirical analysis to decide whether the extent of such fragmentation has influenced the outcome of the particular project in question so far.

In the actual measurement of the degree of horizontal fragmentation the following dimensions will be focused upon:

- The number of actors involved in decisions related to the implementation of the project.

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<sup>56</sup> Ross (1984: 491) defines implementation as “activities directed toward putting a program into effect”, indicating that his contributions should be categorised within the decision-oriented approach to policy implementation. His distinction between the three implementation alternatives may therefore have a corresponding orientation.

<sup>57</sup> In Ross (1988), the three approaches are termed “bureaucratic-authoritative”, “campaign-exhortation” and “market exchange”, respectively.

- The extent – if any at all – of competing and/or overlapping jurisdictions among the organisations involved in the implementation of the project.
- The extent – if any at all – of cross-sectoral co-ordination of initiatives between the governmental actors involved in the project, e.g. through meetings and information-sharing.

### 2.2.2 Vertical fragmentation

“Those at the top have their measures,  
and those below have their countermeasures.”

Chinese aphorism

While policy *formulation* in China is highly centralised, policy *implementation* is increasingly left to agencies at lower territorial levels (Lieberthal 1995). Chinese economic reforms are founded upon a tacit deal of bureaucratic level-by-level flexibility (Lieberthal 1997), making the picture painted above even more complex: Each territorial level of government gives the level below it some elbow room, provided that this produces economic growth and thereby social and political stability. This means giving increased priority to the horizontal (territorial) line of authority over the vertical (functional), resulting in decentralisation.

Vertical fragmentation is taken to mean that a central-level bureaucracy loosens and/or loses control of its replicates at lower territorial levels. This definition serves to highlight the fact that decentralisation may either be a planned process, an unplanned such, or something in between. From a the point of view of the decision-oriented approach to implementation, vertical fragmentation may be regarded as a sign that the state lacks the capacity to control local level affiliates (see e.g. Migdal 1988), resulting in these affiliates distorting decisions taken on higher levels. From a process-oriented perspective, such a development may seem praiseworthy, as it seemingly moves decision-making closer to the people being influenced by decision-making. However, both approaches miss the target somewhat. On the one hand, this decentralisation process happens in a highly centralised country; this may therefore have its upsides in terms of devolution of power and increased participation. On the other hand,

increased decentralisation should neither be confused with democratisation nor with a more dynamic environmental policy, as will become obvious below.<sup>58</sup>

The fact that a cash-strapped central government has delegated a larger part of revenue-raising to local governments, transfers more political power to lower levels in the system (Knup 1997). It has created strong entrepreneurial incentives for local governments. The term “local state corporatism“ has been used to describe how local authorities act as the “corporate headquarters” for different local enterprises (Shue 1988: 62, 70, 143, Oi 1992:100, Lin 1995, Lieberthal 1997, Edin 1998, Walder 1998).<sup>59</sup>

As lower-level actors are granted more economic decision-making authority and more financial independence, they become more attractive for foreign investors, be it public or private. This leaves central level actors even more cash-strapped, and bereaved of the privileges attached to doing business with foreigners. They therefore engage in a fight for foreign financing with actors on lower territorial levels.

More economic freedom does not necessarily imply more money, however. Local governments are faced with budgetary constraints. Facing a discrepancy between resources and obligations, many seek administrative and financial independence through activities other than their “core business” – and become so-called “independent kingdoms” (Lampton 1987b, Sinkule 1993, Hills and Man 1998).

According to the theory of fragmented authoritarianism. Of which some elements were briefly presented in the section on horizontal fragmentation above, there is a potential conflict between vertical lines (*tiao*) and horizontal pieces (*kuai*) of authority, that is, between a unit’s bureaucratic function and the needs of the locality. This is to some extent resolved by a distinction between dominant and non-dominant bureaucratic actors, seen from the perspective on a particular bureaucratic entity. The actor having priority has a so-called *lingdao guanxi* (leadership relationship) with the bureaucratic actor in question, while other actors have *yewu guanxi* (professional relationships) with this actor. However, as soon as a problem requires

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<sup>58</sup> For a short but easily understandable piece on vertical fragmentation in Chinese environmental policy-making and implementation and its consequences, see Wu and Robbins (2000).

<sup>59</sup> Thus, implementation of Chinese environmental policy may be an example of the fact that decentralisation is not necessarily an indubitable good for the environment. This counters much of the research done both before and after the signing of the global Agenda 21 in Rio.

action by more than one *xitong*, or by different territorial actors within one *xitong* (e.g. different environmental protection bureaux), the complexity becomes overwhelming.

Government and Party authority structures running in parallel, in addition to territorial co-ordinating bodies, lead to a situation that the Chinese call *popo duo* (“too many mothers-in-law”): Organs in a particular *xitong*, for example the EPBs at provincial, city, county, and township level under SEPA, may have to report to (at least) two “mothers in law“, namely the government at each organ’s territorial level, and the office one level up in its environmental *xitong*. This creates huge problems of governance, especially if funding comes from the local level, as is the case with SEPA’s local-level replicates.

In his analysis of the Chinese technology transfer system, Ho (1997: 103) echoes these conclusions, in stating that administrative decentralisation as part of economic reform further worsens the problem of a technology transfer system lacking central co-ordination. He ascribes this problem to lacking co-ordination between central and local decision making bodies; localities lacking experience in international technology co-operation; and localities promoting projects in their own interest at the expense of projects benefiting the nation as a whole.

Thus, while this is probably true for any country, environmental policy implementation in China is very dependent upon the capacity and commitment of local implementers. Many observers in today’s China regard the town and village level as the most important arena in policy implementation, as here one deals with tangible resources, and not only with other officials (Lieberthal 1995). Similarly, Holstius and Ma (1995:24), in a study of environmental technology policy, find that the end user perhaps is the most important actor in environmental technology co-operation with China. Empirical evidence from pollution control (Dasgupta *et al.* 1997) and family planning (Zhang 1999: 229) exemplify how local officials find official environmental policies ineffective, and therefore implement them in a “softer“ way, or do not implement them at all.

As Downs (1972) has demonstrated, such a “leakage of authority” is common when centrally initiated policies are implemented locally. The reasons are that the goals of different bureaucratic actors vary, that they will interpret top-level orders according to their own context, and that they have independent power bases. Thus, where the decision leaves room to move for the organisations implementing it, they will seek to maximise their interest within

these constraints. Similarly, Hanf and Underdal (1998: 157) find that vertical disintegration of policy – “a state of affairs where the aggregate thrust of ‘micro-decisions’ deviates more or less substantially from what higher-order policy goals and ‘doctrines’ would seem to require” – is often a problem during domestic implementation of international environmental commitments.

If lower-level officials have not taken part in the formulation of a certain policy, they are probably less committed to its implementation (Andresen *et al.* 1995: 44), as failure will not imply a loss of prestige for them. The larger the number of lower-level actors that can potentially influence implementation, the lesser implementation will reflect the original top-level decision on the issue. It should also be noted that many Chinese local level officials are unfavourably disposed toward environmental values, have low political legitimacy, and lack institutional support from higher levels (Chan *et al.* 1995, see also Gan L. 1999: 325).

It is reasonable to believe that the degree of vertical fragmentation is issue-dependent. It is, for example, probable that localities are more positively geared towards centrally initiated policies whose aim is to protect “their” natural resources than e.g. policies to protect some intangible common property resource whose extraction or degradation would not have serious consequences for the locality in question (Andresen *et al.* 1995: 48). The attitude of local authorities is expected to be more co-operative the more visible and unambiguous the environmental problem in question is for them and their constituency.

On the basis of insights from the literature on environmental policy implementation in China, and particularly the theory of fragmented authoritarianism, the following empirical proposition will be investigated in the empirical analysis to follow:

**Hypothesis 2: The more vertically fragmented authority is within the organisations implementing Project 6-8, the less likely it is that the implementation status of the project is positive.**

In the empirical chapter we will need to document whether authority within implementing agencies in fact has been vertically fragmented. The empirical analysis will discuss whether the extent of such fragmentation has so far influenced the outcome of the particular project in question.

In the actual measurement of the degree of vertical fragmentation the following dimensions will be focused upon:

- The extent – if any at all – of co-ordination (e.g. through meetings and information-sharing) between different levels of the organisations implementing the project.
- The relative influence of central and local bureaucracies, respectively, on the implementation of the project.

### 2.2.3 Relative strength of implementing agencies

If the Chinese political system is characterised by a high degree of horizontal and vertical fragmentation, as argued above, the relative organisational strength of implementing agencies should be of even larger importance for the success of policy implementation in China than in countries with less fragmented decision-making structures. In bureaucratic infighting and consensus building alike, those organisational actors that do not have enough political clout will often lose ground (Lunde *et al.* 1995, O'Brien 1994).

Thus, to understand the relative strength of relevant governmental actors is a central precondition for comprehending the dynamics of Chinese environmental politics. Nevertheless, explicit theoretical discussions as to which parameters for the strength of bureaucratic actors in China are most important and/or easiest to measure empirically, seem to be nearly absent in the literature. However, implicit arguments and suggested indicators can be found in a few contributions, and there are lessons to learn from implementation literature in general and implementation in developing countries in particular.

While Jänicke's (1997: 6) theory on environmental capacity focuses on the strength of proponents of environmental policy, it seems to neglect the role of opponents (Rosendal 1999). Therefore, by emphasising *relative* organisational strength, I want to underline the importance of not only the *proponents* of a proactive environmental technology policy, but their *opportunity structure*, constituted most importantly by the strength of the opponents of their policies and proposals. By "opponent" is meant not only organisations having other subjective interests in a particular project. The organisational "competitors" of the bureaucracies

implementing the project are also included, for example, organisations that do not take part in implementation, but compete with the Ministry of Communications (MOC) for influence within the area of marine oil pollution. The importance of the power relationships between implementing organisations and competing actors have been emphasised by other contributors as well (Najam 1995b: 38-39, Brown Weiss and Jacobson 1999).

Similarly, although we are not primarily focusing on environmental agencies, it is worth noting Triantafillou's (1995: 234-37) observation that environmental agencies in Asian countries (including China) often are incapable of implementing environmental policies. He blames this on "objective" organisational constraints, like inferior levels of technical and administrative capacity, or political constraints, in terms of resistance from technocratic elites within powerful ministries dealing with economic development. Triantafillou concludes that "institutionalisation of the predominant form of political legitimacy – developmentalism" is a crucial obstacle "to the formulation and implementation of tough environmental policies" (Triantafillou 1995: 245).

As touched upon in the two sections above, in the literature on fragmented authoritarianism, rank and the (professional or leadership) relationship to higher- and lower-level bureaucratic organisations can be taken as an indicator of the strength of a particular bureaucratic actor (see e.g. Lieberthal 1995: 157-171, 1997). Fragmented authoritarianism also implicitly focuses on linkages to and support from key personalities or bureaucratic actors domestically and internationally; (lack of) access to information; and organisational jurisdiction as indicators of strength (see e.g. Fingar 1987: 216-223, Economy 1994: 52). Another obvious indicator of relative organisational strength is how other bureaucracies *perceive* a particular bureaucracy in terms of some or all the above-mentioned indicators.

A number of the general contributions in implementation theory highlight organisational characteristics of the bureaucracies responsible for implementation as an important variable in explaining implementation outcomes. However, few relate this explicitly to a discussion on relative organisational capabilities. One exception is Andresen *et al.* (1995: 47) who suggest that "administrative/budgetary strength" of the ministry of environment compared to that of "traditionally 'sceptical' ministries" is a reason why environmental policy implementation success differs between countries. Jänicke (1995: 17) suggests "growth of staff, budget, and scientific competence" as a relevant indicator, while Van Meter and Van Horn (1975) propose

the number – and competence – of an organisation’s personnel, and its access to political resources. Another proposed indicator, as touched upon earlier on, is the personal will and skill of leaders (Jänicke 1995: 7, Jänicke and Weidner 1995: 22).

Among general contributions on policy implementation in developing countries, the book *Politics and Policy Implementation in the Third World* is of most interest. Grindle (1980: 12) states that goals of actors related to implementation will be in conflict, and that “the outcome of this conflict and consequently, of who gets what, will be determined by the strategies, resources and power positions of each of the actors involved”. She continues by suggesting that “[a]nalysis of the implementation of specific programs therefore may imply assessing the ‘power capabilities’ of the actors”. She concretises this by stating that “[t]here may be, for example, differences in the capacity of various bureaucratic agencies to manage programs successfully. Some will have more active, expert, and dedicated personnel than others, some will enjoy greater support of political elites and have greater access to resources, and some will be more able to cope with the range of demands made upon them.”

In the same volume, Cleaves (1980) concludes that “political and administrative actors need to mobilise sufficient power to execute a policy design, and their ability to do so depends on the influence and predilections of others in the political environment”. He continues, “[p]olitical power can be understood as a variable that directly affects implementation because the amount of resources that can be mobilised in favour of or in opposition to a specific policy is vital to estimating its chances for implementation”.

Mainly on the basis of insights from the literature on environmental policy implementation in China and other developing countries, the following empirical proposition will be investigated in the empirical analysis to follow:

**Hypothesis 3: Given that authority is fragmented horizontally and vertically; the more inferior the agencies implementing Project 6-8 are compared to organisational opponents of the project in terms of organisational strength, the less likely it is that the implementation status of the project is positive.**

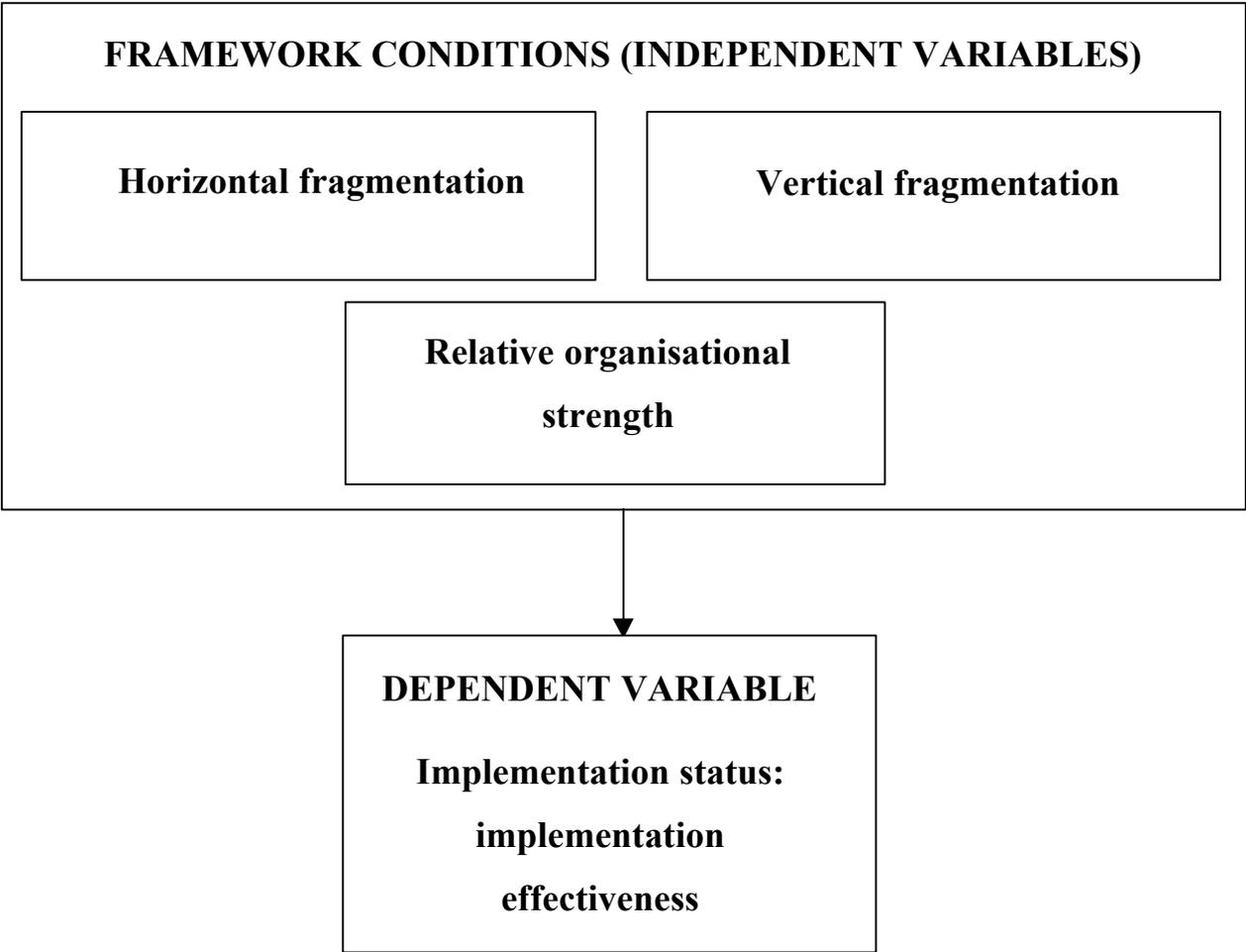
It is the task of the empirical chapter to substantiate whether the agencies implementing the Project 6-8 are in fact organisationally weaker than the organisational opponents of the project, and the task of the empirical analysis to decide whether the relative strength of implementing agencies influenced the outcome of the particular project in question so far.

As obvious from the above, there are numerous possible ways of indicating an organisation's strength relative to organisations having opposing interests. While many contributions focus on the resistance from opposing ministries, the real point of interest here is the "weight" they can put behind this opposition. At least five indicators of this "weight" can be discerned: personnel, the quality and scope of competence, rank, financial resources, and national and international organisational linkages. As it is not possible to map all relevant organisations along all these five dimensions, it is reasonable to limit the documentation to one indicator of administrative capacity (personnel), one indicator of the network a particular organisation can rely on and employ when necessary (national and international organisational linkages), as well as organisational jurisdiction and rank.

### **2.3 Summary and conclusion**

This chapter started by defining implementation as the decision and process by which technology for prevention and control of oil spillage at sea has been and is introduced in China's Agenda 21 Project 6-8. As this project was not fully implemented at the time of study, the dependent variable to be studied in this thesis is implementation *status*. It was further suggested that implementation status should be examined according to the criterion of implementation effectiveness. Subsequently, independent variables – three framework conditions believed to influence the implementation of environmental technology projects in China – were suggested. It was hypothesised that the project would have less chance of being successfully implemented if authority were fragmented horizontally and vertically. In such a situation, chances of successful implementation would be reduced further if implementing agencies were organisationally weaker than their opponents. The suggested causal relationships between the independent variables and the dependent variable are summarised in Figure 2.2 on the next page.

**Figure 2.2 Causal relationships between independent variables and dependent variable**



In the next chapter, the dependent variable (implementation status) will be documented.

“If you go to China as a researcher, you will do tourism;  
if you go to China as a tourist, you can do research”

*Jean Philippe Béja*

### **3 Methodological remarks**

The following methodological discussion focuses on the merits of the case study as a research strategy; reasons for choosing the case of study; methods of data collection (including the role of fieldwork in this regard); and cultural challenges related to conducting the fieldwork. Finally, the robustness of the study’s findings to empirical and theoretical choices (including reliability and validity considerations) is discussed.

#### ***3.1 The epistemological merits of the single case study approach***

The research strategy employed in this study is a single case study of China’s Agenda 21 (CA21) Project 6-8, “Prevention and Control of Oil Spillage at Sea”. In the following, it will be explained why the single case study research design was chosen. Potential problems related to using this methodological approach will be discussed, and possible solutions to these problems suggested.

Yin (1994: 13) defines a case study as “an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”. He finds that the case study research strategy is advantageous “when a ‘how’ or ‘why’ question is asked about a contemporary set of events over which the investigator has little or no control” (Yin 1994: 9). The case study research strategy is therefore ideal to understand the topic of this thesis; namely how organisational factors influence the implementation of environmental technology policy in China. This topic is both contemporary, explanatory (a “how” question is asked”), and the examined phenomenon (implementation of environmental technology projects in China) is not intuitively distinguishable from its context (e.g. organisational framework conditions). Another strength of the case study is that it opens the possibility of using varied sources. Furthermore, case

studies may be applied in a very flexible way; they may be explanatory (as is the case in this thesis), descriptive, illustrating or exploratory.

The single case research strategy renders possible a thorough examination of causal mechanisms through the examination of a broad range of data and information sources. It also eases the process of obtaining clear operational measures of data (Yin 1994: 42). A considerable number of key decision-makers involved either in implementing CA21 as such or the case project in particular were interviewed during the fieldwork. In this way, a good overview has been obtained of the different opinions concerning factors influencing project implementation. This would probably not have been possible if the scope were to be widened to comparing two national A21s or including more CA21 projects. Furthermore, the single case study should be regarded as a departure for further studies.

Single cases may be used to confirm or challenge a theory (the critical case), to present genuinely new insight (the revelatory case), or to represent an extreme or unique case (Yin 1994: 38-40). As will be returned to below, this study falls into the latter category.

Yin (1994: 41-44) distinguishes between holistic and embedded single-case studies, where the latter describes studies where (a) subunit(s) within the supraunit of analysis are given attention in addition to the supraunit. This is a holistic case study, in the sense that it concentrates on a *project*, rather than a programme as well as a project included in this programme. The totality of a project is studied, instead of studying the project as part of a programme. According to Yin, holistic single-case studies are advantageous when the theory underlying the case study itself is of a holistic character. However, there is always a danger that this research strategy leads to case studies where no phenomena are studied in sufficient detail. Another problem is that, while many researchers emphasise the flexibility of the single case study approach as one of its strengths, a common criticism of holistic single case studies is that their focus changes underway – be it consciously or unconsciously. If this should happen, the original research design becomes unfit to answer the new questions being asked (Yin 1994: 42).

However, the independent variables open for incorporating aspects of the formulation and implementation process of the CA21 *programme* that are relevant for the implementation status of *Project 6-8*. Thus, the strengths of the holistic and embedded case study are combined. This may make it easier to keep to the original focus of the case study, while not

entirely abandoning the advantages of flexibility. Furthermore, the study avoids a common pitfall associated with embedded single-case studies, namely that the researcher focuses only on the subunit level at the expense of the larger unit of analysis.

The case study as a research strategy has had – and still has, in several quarters – a low status in political science. It is criticised for lack of rigour, and lack of basis for scientific generalisation. Such arguments are not always based on an adequate understanding of the fact that case studies are *not* representative samples. The aim of the case study is analytical, not statistical, generalisation; the purpose of case studies is to form the empirical basis for theory-building, not for generalisation to populations or universes (Yin 1994: 10).

The main methodological problem to be aware of in conducting case studies is perhaps that it may be difficult to test afterwards whether a particular case study has been conducted in a proper way or not. Conducting Yin's four design tests (construct validity, external validity, internal validity and reliability) is a useful way of examining the robustness of the case study to empirical and theoretical choices (see Section 3.5).

### **3.2 Criteria for the choice of case**

As mentioned in the introductory chapter, it is relevant to study the implementation of environmental policy in China because environmental problems threaten China's social fabric, and many of these problems have regional and global implications. On the other hand, China is a potential co-operation partner in the development of the global environmental technology industry.

The case is relevant, because it is extreme; everything has seemed to be set for successful implementation. This should imply that if this project does not succeed, a large number of other projects will fail as well. Norway, one of the countries having the best record of giving development aid (in terms of percent of GDP) decided to fund a project in China, the country that receives the most development aid in the world. Norway had a genuine will to get the project going, if not for other reasons so at least because of prestige and future business opportunities. Chinese authorities had generated the project idea themselves, because of progressively worse marine pollution problems, and therefore had an interest in implementing the project as well. Furthermore, China had taken the lead among countries the South in

following up the global Agenda 21. The fact that high-level commissions were put in charge of China's Agenda 21 signalled that it was given high priority, and this was further underlined by the publishing of a list of what was intended to be ready-to-implement priority projects.

Other factors also suggested that the project would be successfully implemented. The project site was located near the decision-makers in Beijing, in one of the most well-off areas of China. The project was to solve a tangible problem. It was to be implemented in a period when China's relations to the outside world were all right, at a time when environmental problems in general were focused upon, and the Chinese economy rather good.

In addition, the project was chosen because it was the most successful of the four CA21 projects involving Sino-Norwegian co-operation (the four other projects never were implemented; see section 4.2 below). Then one should suppose that the conditions were better for realisation in this project than in the other four projects. This means that if there proved to be problems related to the implementation of this project, there would be a fair chance that such problems had been even more prominent in many other CA21 projects, including the other "Norwegian" ones.

As China was a pioneer in following up the global Agenda 21, experiences from the implementation of China's Agenda 21 could be relevant for other countries in the South (and, indeed, North) implementing their own national Agenda 21. If a project having so high odds for success as the case of study would not succeed, this should have implications for the design of schemes for North-South technology co-operation. However, it should also have implications for the arguments countries in the South use for obtaining funding and technology from the North. If a project that is strongly supported by a country in the North were not to be implemented, it would suggest organisational and/or institutional dysfunctions in or among the implementing agencies in the country in the South.<sup>60</sup>

As Chinese politics is very complex, both for the researcher and the reader, a deeper understanding of the dynamics related to environmental technology policy implementation might be obtained through studying one single project rather than a host of projects – at least as a starting point. General overviews easily become too abstract to carry meaning. There are

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<sup>60</sup> An implementation failure would also strongly suggest that there were such dysfunctions in the development aid apparatus of the country in the North (in this case Norway), but this is not the focus of this study.

obviously also pragmatic reasons why *one* particular project within *one* particular programme in *one* particular country is highlighted. The first is the magnitude of the data collection work. Choosing CA21 as a whole as the subject for the case study would be extremely demanding, as more than 50 ministries, agencies and department took part in formulation, and even more actors took part in the implementation of pilot projects – which also covered a very broad range of environmental problems. Conducting a comparative case study of CA21 and another national A21 would make it even more difficult to finish the thesis within the stipulated time-frame. The same is true for including more CA21 projects to add a comparative dimension to the single case study.

Second, given that fieldwork is considered necessary to achieve high-quality research on political and institutional processes like the one studied here, the question whether or not to expand the study is also a question of financing. Conducting a comparative study of two national A21s consumes money. This also holds true for studying many different projects in a large country like China, as they often are located thousands of kilometres apart.

Focusing on one of the CA21 projects involving Norwegian actors has eased the access to information, as it has been possible to interview many of the people involved in project implementation without spending too much time and money. All the projects involving Norwegian actors under the CA21 umbrella were screened through preparatory interviews in Norway and written documentation (see Sections 3.3.1 and 3.3.4), before choosing Project 6-8 as case study. The screening did not reveal any major points of deviation from the conclusions reached in this thesis.

### **3.3 Data collection**

Data collection was done through preparatory interviews, fieldwork (including interviews and direct observation), and examination of written material.

### 3.3.1 Preparatory interviews

In the preparatory phase of this study, I had an extensive dialogue with researchers and representatives from Norwegian environmental technology companies active in China, especially the companies involved in Project 6-8.

There were a number of reasons why these interviews were conducted. First, although it would be an exaggeration to call the interviews pilot case studies, they definitely gave access to detailed knowledge about the case study project, increasing my confidence before travelling to China that the project was suitable.

Second, the preparatory interviews were crucial in defining which actors were central on the Chinese side – according to the Norwegian representatives, that is. This made it possible to map and contact most interviewees before going to China, which was necessary in order to increase the output of the fieldwork in Mainland China.

Third, these unstructured – and therefore exploratory – interviews were also instrumental in carving out the analytical framework of the study, the basic elements of which were developed largely in parallel with these interviews. The interviews were therefore also very important in narrowing down the scope of the study.

Just before going to Beijing, where most of the interviewees were situated, another type of preparatory interview was conducted. Several researchers at Hong Kong universities, and representatives from an environmental NGO in Hong Kong with extremely good connections to the central government in Beijing, were interviewed about their understanding of the problems facing implementation of environmental technology policy in China. The interviewed researchers are dominant in the field, and therefore able to supplement my theoretical understanding gained from older written sources. These interviews were an important part of the preparations for the interviews directly relevant to the case study.

### 3.3.2 Fieldwork

The empirical data on which this study is based, was mainly gathered through fieldwork in the period 9 June-13 July 1999, in Hong Kong, Beijing and Yantai.<sup>61</sup>

A case study is not synonymous with conducting fieldwork. This is only one out of many data collection methods that a case study may or may not include, and both qualitative and quantitative methods of data collection may be employed in a case study. Fischer (1985)<sup>62</sup> defines fieldwork as “[r]esearch on a group in the environment in which it normally lives, under which conditions remain ‘*natural*’, that is, that they are not manipulated for research purposes. The goal is data collection by the use of *different methods* and with *different objectives*”.<sup>63</sup> Fieldwork gives access to alternative perspectives, contact with other researchers, and dialogue with groups relevant for the research being conducted.

In the analytical framework chapter, I argue that in order to understand properly the national framework conditions for implementation of environmental technology policy, general theories should be complemented by theories taking characteristics of the national political system into account. Using fieldwork as data collection method seems natural in a study making this sort of argument.

Conducting fieldwork to study Chinese politics also removes a number of barriers to information, as personal relations are more important in China than in many other countries when it comes to getting access to information.

### 3.3.3 Interviews

The case study relies heavily on semi-structured interviews with several groups (see Appendix 10.2 for a complete list of interviewees). The interviews were focused (Yin 1994: 84-85), but still open-ended. The respondents were asked a set of similar questions (without fixed answering alternatives), based on an interview guide (see Appendix 10.1). After this general

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<sup>61</sup> Detailed information about the interviews conducted and the written material collected during the fieldwork in Mainland China is included in Sections 3.3.3 and 3.3.4, respectively.

<sup>62</sup> See also “Doing Fieldwork in the People’s Republic of China”, Reader zum Intensive Erasmus Course, 24-28 June 1991, Heidelberg/Leiden.

introduction, they were asked specific questions, varying according to their relation to China's Agenda 21 and the case project, and when they were interviewed.<sup>64</sup> Some of the interviewees have been interviewed several times, and therefore may be described as informants, using Yin's typology.<sup>65</sup>

For semi-structured interviews as those conducted in this study, the interview guide should contain the coarse features of topics to be covered, as well as suggestions for questions (Kvale 1997: 76-78). The use of tape recorders during interviews was limited to a minimum, as this could easily have resulted in the respondents being less outspoken. Responses were therefore noted down, and transcribed within a day after the interview was conducted, in order to capture as much as possible of the information from the dialogues while still keeping their dynamic aspects (Kvale 1997: 78). Of the 62 respondents interviewed (including preparatory interviews), 7 wished to remain anonymous. A list of interviewees is included in Appendix 10.2.

During the fieldwork in Mainland China, the following groups of respondents were interviewed:

- Researchers. Usually this group is more outspoken than others in describing structural challenges facing the Chinese political system.
- Bureaucrats working with CA21 or environmental technology in the Ministry of Communications (MOC), the Ministry of Foreign Trade and Economic Co-operation (MOFTEC), the Ministry of Science and Technology (MOST), State Development Planning Commission (SDPC), and State Environmental Protection Administration (SEPA).<sup>66</sup>
- Bureaucrats from international organisations active in the implementation of CA21, most prominently UNDP.
- Representatives from Chinese non-state environmental organisations.
- Representatives from Norwegian business and government in China involved in Project 6-8 or similar projects.

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<sup>63</sup> The original text was: "Forschung im Lebensraum einer Gruppe durch den Untersuchenden unter Bedingungen, die "natürlich" sind, also nicht für Untersuchungszwecke verändert werden. Ziel ist Datengewinnung mit *unterschiedlichen Methoden* und mit *unterschiedlicher Zielsetzung*." The translation is mine; the italics are the author's.

<sup>64</sup> Obviously, respondents interviewed late in the fieldwork were naturally asked questions based on the results from earlier interviews.

<sup>65</sup> Gunnar Mathisen, Erik Sørbye, Stein Erik Sørstrøm, Song Delin and Roald Wie have all played a role close to the informant's, as have two of the anonymous interviewees.

<sup>66</sup> After the restructuring of the P.R.C. governmental structure in March 1998, the SPC, the SSTC, and NEPA are known as State Development Planning Agency (SDPA), Ministry of Science and Technology (MOST) and State Environmental Protection Administration (SEPA), respectively. These abbreviations will be used when writing about the period after this date.

- Employees at the Administrative Centre for CA21 (ACCA21). This was perhaps the most important part of the fieldwork. Many of the employees at ACCA21 had been working with CA21 since late 1992, and therefore been involved during the whole implementation process of both Project 6-8 and CA21 as such. This part of the fieldwork also took the character of direct observation, as the centre is one of the key bureaucratic proponents of CA21.
- Finally, the fieldwork included a site visit to inspect the case project, currently being implemented, and interviews with key persons involved in its implementation.

Most questions asked yielded surprisingly open-hearted answers. Actually, the most reserved interviewees have been other countries' representatives in China, probably out of fear of insulting the Chinese government. Apart from the possibility of remaining anonymous, one reason for the seemingly frank responses from the Chinese may have been that the interviewees did not fear any repercussions from being cited in a thesis to be published in a very limited number of copies in a country far away from China.

Several problems are often associated with personal interviews. As many of the interviewees are still working with the case project, and it was not fully implemented at the time of study, the problem of *poor recall* must be regarded as marginal in this study. Nor should *biased answers* constitute a serious problem, as the viewpoints of the Chinese interviewees have been triangulated against those of other Chinese interviewees with a different institutional affiliation and Norwegian interviewees. However, there is some evidence that respondents answer according to institutional affiliation. *Poor or inaccurate articulation* could potentially constitute a problem for the interviews conducted in Mainland China. However, during those interviews that would have posed problems in this regard, an interpreter assisted me. Two other potential problems related to conducting interviews are those of *complex, vague or leading questions*, and *reflexivity* (a situation when the interviewee expresses what (s/he believes) the interviewer wants to hear). Assessing the magnitude of problems like this is hard. However, most information given by interviewees has been confirmed by other interviewees that do not know the interviewee in question, and there are few examples of interviewees giving answers markedly different from the rest. Therefore, unless most or all interviews are biased – which does not seem likely – the problem is judged to be of minor importance. Even though there have not been serious methodological problems related to the interviews conducted, the

information collected through the interviews has been compared to information found in written material to increase its reliability.

### 3.3.4 Written material

The written material has mainly consisted of

- Material from Chinese sources, particularly from ACCA21, SEPA, and SDPC.<sup>67</sup> This includes research publications on CA21; general information material; newsletters; newspapers; journals; and material published on web sites.
- Official documents and correspondence related to CA21, the case project and the other CA21 projects with Norwegian involvement, from archives in Norway. Includes the Norwegian Agency for Development Co-operation (NORAD), Ministry of Foreign Affairs, Ministry of the Environment, and the Norwegian companies involved in the CA21 priority projects.
- Material published in countries other than China on A21 implementation in China. This includes articles in journals, newsletters and newspapers, web sites, newsgroups, electronic bulletins and electronic mailing lists.<sup>68</sup>
- Books, doctoral dissertations, master's theses and articles containing theories and empirical evidence on Chinese (environmental) technology policy, (environmental) policy implementation in China, (environmental) technology transfer to China, and the social construction of technology.<sup>69</sup>

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<sup>67</sup> Among these are *China's Agenda 21 Update* (1995-97), *CESTT Newsletter* (1998-), and *CESTT Policy Digest* (1999-). The ACCA21 web site is perhaps not as extensive as one could wish, given that it is supposed to be an information clearinghouse for sustainable development in China, but still very useful. Systematic searches for the period 1993 until fall 1999 have also been conducted in more general sources of updated information on Chinese politics, as the newspapers *China Daily*, *China Daily Business Review*, *China Business Review*, and *South China Morning Post* (the first three are government mouthpieces, but still convey useful information. While doing my fieldwork in China, I also had a rewarding visit at the China Environment and Sustainable Development Reference and Research Centre, at the China-Japan Friendship Environmental Protection Centre.

<sup>68</sup> The web site of the Professional Association for China's Environment (PACE) contains the journals *China Environment Reporter* (1997-98) and *Sinosphere* (1999-). The International Institute for Sustainable Development (IISD) in Canada is the secretariat of the Sino-international NGO China Council for International Co-operation on Environment and Development (CCICED), and publishes the *CCICED Newsletter*. The *China Environment, Health and Safety Review*, published by Environmental Resources Management (ERM) China, a privately operated and managed joint venture corporation providing environmental, health and safety consulting services in China, is a very good source of updated information on new policy developments. ERM China's web site also contains many useful publications in this regard, as do the web sites of the U.S. Embassy in China, and the Commission for Sustainable Development, respectively. The U.S. Embassy in Beijing also publishes *Beijing Environment, Science and Technology Update*. Among the journals irregularly publishing articles on Chinese environmental policy are *China Journal*, *China Quarterly*, *Issues and Studies*, *Journal of Contemporary China*, and *China Information*, as well as the electronic bulletins *China Online*, *Inside China Today*, and *China News Digest*. The *Earth Negotiations Bulletin's* reports from the Earth Summit + 5 session have also been very useful, as have news briefs from Reuter's *World Environment News*.

<sup>69</sup> Much of this material was collected during a two-week stay at the Nordic Institute of Asian Studies (NIAS), Copenhagen.

### **3.4 Cross-cultural challenges**

Social science the way it is known in countries in the North has a rather short history in China. In the period between 1978 and 1980, the door was opened for social science research in China, after a pause of almost thirty years. Sociology had been banned since 1957, while political science never really had established itself as a discipline in China before the ban of social sciences was introduced (Béja 1999). Nevertheless, it is no longer possible to dismiss Chinese social sciences as Leninist crap (Halskov Hansen 2000). Their quality has improved remarkably the last ten years or so, as a consequence of the opening up of China to the outside world, increased accessibility of sources, and less strict censorship.

However, until very recently, researchers from the North were not allowed to conduct research in China. Before that, they relied either on official documents or interviews with Hong Kong refugees for their research, both sources biased (although in different directions). The Chinese authorities still to some extent view social sciences as subversive to the “national interest”, and as a means to secure social control and plan the future. The problem for the researcher coming from the North today thus continues to be: should I work with the system, or approach the data I regard as relevant, seen from my own (prejudiced) point of view? Conducting research in China is still to a certain extent synonymous with being influenced by official rhetoric.

Relatively poor mastery of Chinese language prevents me from reading complicated Chinese texts, and conducting detailed interviews on complex political questions in Chinese. Although this is to some extent a handicap when doing qualitative research in China, it has not posed serious problems for the writing of this thesis, not least due to Mr. Zhu Rong-fa, who assisted me during interviews with MOC representatives and on the visit to the project site. He speaks and writes Norwegian and English fluently, and has been an interpreter for official Norwegian environmental delegations and researchers in China since the late 1980s. Unfortunately, economic considerations forced me to manage without him during the rest of the fieldwork. However, this turned out to be much less of a problem than anticipated. Most of the interviewees were able to communicate fairly well in English, and in the very few cases where assistance turned out to be necessary, the interviewees provided an interpreter.

The most relevant, updated and interesting Chinese-language information is often to be found in books, as they are not censored as thoroughly as, for example, newspaper articles. However,

to my knowledge, few if any books have been published in Chinese on the particular subject of this study, and some of the authors of the most relevant books having been published were interviewed during the fieldwork. Prominent Chinese scientists also are starting to publish extensively in English, and some of the most important contributions have been translated into English. Interviews with the Hong Kong researchers in the field were also very helpful in this regard, as many of them have the advantage of both understanding Chinese and being able to follow the international research on the subject.

Perhaps the largest problem, therefore, is my limited ability to read Chinese-language newspaper articles. Chinese-language newspapers are becoming increasingly outspoken – especially compared to news pieces translated from Chinese into English. The environmental field is a good example in this regard, as the environment is a relatively non-controversial issue where the government has stated the necessity of awareness and information-sharing. For example, while the English-language weekly *China Environment News* provides interesting observations, the Chinese-language original edition, *Zhongguo Huanjing Bao*, is generally considered to give much more valuable analyses and information, and is issued on a daily basis. Many Chinese-language newspapers have now developed extensive web sites, and several search engines have been developed for searching Chinese newspapers. These information sources I am not able to take advantage of unless the material is translated into English by other news media.

One of the key characteristics of decision-making in China is that decisions are pushed upwards to the top for approval if consensus-building runs into problems at lower levels. However, top-level decision-makers are (nearly) impossible to interview. In an analysis where one proposition is that the power and connections of a few central people are of critical importance for a decision to be implemented (see Section 7.2.1), it would have been valuable to discuss such problems with those experiencing them in person. However, I have got access to a number of quite high-ranking and knowledgeable persons who themselves have access to top decision-makers. Hence, the lack of opportunity to interview top-level decision-makers should not undermine the conclusions of this study. Indeed, it is also important to avoid an elitist bias, as the successful implementation of environmental technology projects depends just as much upon the commitment of street-level bureaucrats.

### **3.5 Reliability and validity**

#### **3.5.1 Construct validity**

To increase construct validity, clear operational measures should be established for the concepts being used (Yin 1994: 33). It is important to employ various information sources in order to secure that theoretical and empirical concepts correspond to each other.

Employing concepts designed for studies in the North to studies in the South may be criticised on the grounds of construct validity. As elaborated upon in Section 7.2.2, the social construction of technology model originates from studies of technology development in the North. This is a weighty reason why I have chosen mainly to analyse the implementation of China's Agenda 21 through the lenses of theories of environmental policy implementation in China in particular. Concepts used in the thesis are therefore either directly based on established theories on Chinese politics and society (horizontal and vertical fragmentation) or derived from such theories (relative organisational strength, individual-cum-organisational relation building).<sup>70</sup>

While this vouches for correspondence between theoretical and empirical concepts, it should be added that it would be possible to add more indicators for each of the variables. For example, there is no mentioning of the time factor among the indicators of fragmentation, even though fragmentation is closely related to the fact that decision-making processes are protracted and disjointed. However, the number of indicators is limited due to the limited scope of this thesis. It should also be noted that the reason that the characteristics of organisations' leaders is not included among the indicators of relative organisational strength, is that this would blur the differences between relative organisational strength (a structural variable) and individual-cum-organisational relation building (a strategy variable).

By making a distinction between the concepts of implementation and compliance (see Section 2.1), it is hoped that the inclusion of external variables in the definition of the dependent variable is avoided.

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<sup>70</sup> The concept of individual-cum-organisational relation building will be presented in Section 7.2.1. Jänicke's (1995, 1997) work on framework conditions for environmental capacity also partly takes countries in the South as its departure.

Interviews have been written in full and distributed to the respondents by e-mail for comments, to improve intersubjective understanding of concepts used during interviews. Both the interview files as they were originally saved and the revised ones will be kept for future documentation. Parts of the thesis have been published elsewhere, and therefore been subject to independent evaluation. As showed in Section 3.2, multiple sources of evidence have been used: various kinds of written sources, interviews with different stakeholders in the project, and observation. This is anticipated to make the measures of the phenomena more accurate. Documents directly related to the case study are listed separately in the references section, so that they are more easily identifiable for readers having a special interest in examining the degree of correspondence between theoretical and empirical concepts.

### 3.5.2 Internal validity

As this is an explanatory project (cf. Section 1.4 above), some observations on internal validity concerns (e.g. the quality of theoretical claims of causal relationships) should be made.

The two main factors that should be taken into account concerning internal validity, are spurious relationships caused by third variables, and chronology, e.g. showing that the suggested independent variables are preconditions for rather than consequences of implementation status (the dependent variable).

Regarding chronology, the following assumption has been made: horizontal and vertical fragmentation produces a situation where the importance of relative organisational strength increases;<sup>71</sup> horizontal and vertical fragmentation coupled with relative organisational strength may provide for strategies like individual-cum-organisational relation building and tactical translation of technology (the assumptions on strategies will be presented in Section 0). This is based on the assumption that interaction between individuals creates structures, which in turn influence the strategies of individuals' and the organisations of which they are part. Thus, the established causal relationship between these independent variables and the dependent variable (implementation status) is based on the assumption that in order for a project to be implemented in the first place, bureaucratic actors and structures need to exist. However, as implicitly assumed in the discussion of agent and structure in the analytical framework and the

concluding chapter: as individual interaction is assumed to be the basis for structures, it would be illogical to argue that actor strategies would not influence structures once these have been established (e.g. a feedback mechanism).

The specification of the unit of analysis also influences internal validity. For an elaboration on the choice of unit of analysis in this study, see Section 3.1.

As indicated in the analytical framework chapter above, economic, technical, cognitive and institutional framework conditions may influence environmental technology project implementation as well. There are no reasons to believe that organisational framework conditions are not of importance (rather the opposite, I believe), but all the above-mentioned four categories of framework conditions – perhaps especially economic ones – exert a substantial influence on implementation processes. This is briefly touched upon in the conclusion.

### 3.5.3 External validity

External validity concerns defining the domain to which the findings of a study can be generalised. Again, case studies are concerned not with statistical but *analytic* generalisation, meaning “the investigator’s goal is to expand and generalise theories (...) and not to enumerate frequencies” (Yin 1994: 31).

This study is focusing on organisational framework conditions for environmental technology policy *in the People’s Republic of China*. The Republic of China (Taiwan) is therefore not included. Hong Kong became a part of the People’s Republic of China on 1 July 1997 and Macao became a part of China 20 December 1999; therefore, there are no projects under CA21 focusing on the Hong Kong and Macao Special Administrative Regions.<sup>72</sup> Another reason to keep these areas out of an analysis of the People’s Republic of China is its unique political-institutional status due to their long period under foreign rule.

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<sup>71</sup> It is important to note that this does *not* imply that horizontal and vertical fragmentation precedes organisational strength. Quite the opposite: organisations have to exist in order for them and/or the relationship between them to be fragmented – however.

<sup>72</sup> However, this may well change – *South China Morning Post* 5 June 1997 raised an eyebrow or two when it described China as an example for Hong Kong to follow in terms of implementing Agenda 21.

As the study examines one case only, it is not meant to be a strict empirical test of the theoretical framework presented in Ch. 2. Rather, it tries to describe and explain actual causal relationships in this particular case. The case study may thus produce general conclusions on theoretical hypotheses applied in the study, but generalisation to populations or universes is not possible. By examining whether a theory is applicable to a certain empirical phenomenon, it is possible to assess the relevance of the applied theory, and thus develop and generalise theories.

Project 6-8 was still under implementation when the fieldwork in China was finished, in mid-1999. The main problem related to studying a project currently under implementation is that the assessment of whether implementation is successful or not according to a given set of criteria must necessarily be of a preliminary character. The main reason for this, of course, is that, in theory, the values on variables influencing implementation success may change until years after the project is successfully implemented.<sup>73</sup> Objectives and planned outputs related to intangibles as capacity building are hard to trace and often do not produce immediate results. As such aspects are important in this thesis, this is definitely worth noting, and suggests cautiousness with regard to the external validity of the thesis' conclusions. However, most evaluations of development aid projects actually take place before the projects are finished (Dale 1998). In addition, important parts of the project had come a long way in the implementation process at the time when the fieldwork was conducted.

The conclusions of the study are strictly speaking not valid outside their own defined framework. However, findings and conclusions from this and similar case studies can contribute to strengthening or weakening the explanatory power of existing theories, and thereby could be regarded as steps towards the formulation of a new theory.

Selecting effectiveness as the sole criterion for successful implementation status (the dependent variable of the study) raises two important methodological issues. First, the external validity of the study's conclusions is reduced by the fact that only one aspect of implementation is treated, as opposed to a situation where other criteria (as relevance, sustainability and efficiency, see Section 2.1) were included as well. The implementation process of the project can therefore only be judged as successful or unsuccessful according to this aspect of implementation, and generalisations are consequently limited to implementation effectiveness.

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<sup>73</sup> This is especially relevant for the evaluation of sustainability (see discussion on criteria for successful implementation above).

Furthermore, if criteria for implementation effectiveness had been followed blindly in the empirical and analysis chapters, the study would also have run the risk of getting a top-down focus (cf. Section 2.1), because success would have been evaluated according to the objectives of CA21 and Project 6-8, rather than the problem(s) it set out to solve in the first place. However, as will become obvious in Ch. 4, the results obtained by using the effectiveness criterion have been evaluated with this problem in mind. Thus, the conclusions reached regarding implementation effectiveness are far more balanced than what would have been the case if the effectiveness criterion had been employed uncritically. After all, many deviations from original objectives and planned outputs may be due to *improvements of* – rather than weaknesses in – project design.

A number of limitations in terms of external validity have been mentioned, suggesting cautiousness when generalising the results of the project outside the realm of other marine pollution technology projects in China and (to a certain extent) other projects under the CA21 umbrella. Nevertheless, the conclusions of the study should be of interest for the research on environmental policy implementation in China in general (perhaps in other countries in the South as well), and on policy implementation (especially implementation effectiveness) in other policy areas in China.

In the analytical framework chapter, I argued for the use of theories adapted to the realities of Chinese politics in order to be able to grasp the essence of political processes in the country. However, it is reasonable to believe that the processes and patterns observed may prove and/or contest theoretical and empirical observations made in other contexts as well, for example implementation of (environmental technology projects as part of) Agenda 21 in other countries (be they in the North or in the South).

The case project *could* be biased in a number of ways. First, the CA21 projects could be more influenced by central level actors than are many other environmental technology projects. Second, the geographical location of the project – near the central bureaucracy in Beijing, and in a comparatively rich area – could be of relevance for the assessment of possibilities for generalisation. The period of project implementation could also be important, as China is going through a period of rapid reform, when framework conditions change rapidly. Projects without foreign involvement might also yield somewhat different results – for example, some respondents asserted that *guanxi* played a more prominent role in projects without foreign

involvement, as these were subject to less stringent control routines. The type of project (high or low priority area, hardware or software focus) might also influence the possibilities for successful implementation. On the other hand, the same political forces are now fuelling technology acquisition and economic growth all over China, and the environmental problems to be augmented through the use of environmental technology is familiar to all of China.

#### 3.5.4 Reliability

The reliability of research depends on the extent to which the procedures leading to the conclusions of a study can be repeated, producing the same results. The repeatability of the methodological steps in a thesis depends not only on how transparently they are presented but also on their degree of accountability. As mentioned in Section 3.3.3 above, I have sought to increase reliability of the study by employing an interview guide, writing out the interviews immediately after they were conducted, and sending the transcripts to respondents for approval. It should be noted that I have not received feedback from all respondents on the material sent to them; however, it was stated that they did not need to give feedback unless they had comments.

Part of the criticism towards qualitative research has been that the results of the interview hinges upon – and thus may be biased by – personal relations developed between researcher and key individuals (interviewees, administrative personnel) related to the case study. This may be partly true in the case of China. To a certain extent, *guanxi* (instrumental personal relations) are necessary to access important written information, and to be able to interview the relevant respondents.<sup>74</sup> Most interviewees were contacted through experienced China researchers, business representatives or government employees (see Ch. 7).

Individual-cum-organisational relation building describes intangible processes that have an ambivalent status among the Chinese. The borderlines between such relation building on the one hand, and corruption and bribery on the other, are not clear, and there is generally no clear distinction between positive and negative aspects of such relation building (cf. Pye 1995b). This makes the phenomenon hard to study, as respondents may hold back information. While this could potentially make it difficult to replicate the results of this thesis, it should be noted

that *guanxi* has been subject to extensive research the last decades, providing a firm platform for further studies, and that there seems to be easier to obtain high-quality answers on such matters now than only a few years ago.

### **3.6 Summary and conclusion**

The case study was chosen as research strategy because it is well suited to examine the interrelated and project-specific contextual factors influencing the outcome of Project 6-8. The case project was chosen mainly because it was extreme in the sense so many factors suggested that it would be implemented successfully. The holistic single case study is advantageous because it makes a thorough examination of causal mechanisms possible, and makes it easier to obtain clear operational measures of data. Data collection was done through preparatory interviews, and fieldwork (including interviews, direct observation, and examination of written material). My limited ability to read Chinese-language sources and conduct interviews in Chinese did not pose a serious problem to the writing of this thesis. The main problems related to the robustness of the study's conclusions to empirical and theoretical choices were judged to be those related to the definition of the dependent variable. However, the fact that the case project was not fully implemented, did not pose serious problems for the assessment of its implementation status, as major parts of the project were almost finished at the time when the fieldwork was conducted. The fact that the thesis is limited to studying implementation effectiveness rather than all possible indicators for implementation status, suggests that generalisation should be made with caution.

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<sup>74</sup> Christophersen (1994) reports how her husband's *guanxi* made it possible for her to redefine her thesis work from research to "visits", and thereby circumvent the restrictions placed by the current political climate in China on possible methodological approaches at that time.

*“[E]ffective dissemination of appropriate environmental technologies at affordable prices will be a major challenge to the [Chinese] Government in implementing its Agenda 21 strategy”*

*Arthur N. Holcombe, Resident Representative,  
UNDP Beijing<sup>75</sup>*

## **4 Empirical mapping of the dependent variable: the implementation effectiveness of China’s Agenda 21 Project 6-8 so far**

The chapter opens with an overview of China’s marine pollution problems today. Following this, the implementation status of Project 6-8 under the Priority Programme for China’s Agenda 21 (PPCA21 1994), is evaluated according to the criterion for successful implementation status chosen in Section 2.1 above, namely effectiveness.

### **4.1 China’s seas – hope or demise?**

The Chinese coastline, 18,000 kilometres long, is the most heavily populated in the world, has one of the world’s heaviest concentrations of industry, and has a large number of shipping routes. It has played a central role in China’s massive modernisation strategy, as one of the main elements of the strategy has been to give priority to coastal development through the establishment of Special Economic Zones, enjoying more autonomy than other areas of China. As China supports 22 percent of the world’s population on only about 10 percent of its arable land,<sup>76</sup> the Chinese place their confidence in China’s vast oceanic territory, totalling 3 million square kilometres, and deem it vital to assuring China’s future.

However, marine oil pollution is a serious threat to China’s coastal environment as well as its economy. It endangers the thriving fishery and mariculture industries, salt production, and tourism (Lu 1990, Yu 1993, MOC 1996, Zou 1999). Over 70 per cent of China’s coastal waters

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<sup>75</sup> Speech at the Closing Ceremony of the International Workshop on China’s Agenda 21, 25-29 October 1993 (Holcombe 1994: 172).

<sup>76</sup> The size of China’s arable land is a hotly debated issue, not least due to the pessimistic publications of the WorldWatch Institute. The official Chinese figures were revised upwards by as much as 40 percent in 1998 in order to correct unreliable statistical data, thus increasing China’s portion of the world’s arable land from 7 to 10 percent.

are polluted and below national standards. Recent analyses conducted by SOA have showed a constant environmental degradation in the coastal sea area, and an expansion of the areas polluted. Pollution by organic matter as well as oil spills have been increasing.

As mentioned above, oil resources are mainly distributed in the North and the interior of China. Of these, 40 percent are transported to coastal or riverside oil enterprises. China intensifies its search for and development of oil resources, and sea borne oil transportation will therefore increase. China is gradually leaving its former strategy of self-sufficiency in energy supplies to the advantage of buying oil and gas abroad (Rashid and Saywell 1998, Buen 1998b, U.S. Embassy 2000b). While there are ambitious plans for building new pipelines, the ocean transportation of oil will most probably increase as well.

So will accidents, if the oil spill contingency system along China's coastline is not developed. From 1973 to 1994, there were 26 serious accidents, of which 22 involved oil spillage from ships, resulting in leakage of more than 21,000 tons of crude oil and other chemical materials into China's seawaters.<sup>77</sup> According to statistics from the Ministry of Communications (MOC), there were 2242 ship oil spill accidents in China's coastal areas between 1976 and 1996, and since 1994, serious oil spills have increased by five to seven cases annually.

China recently acceded to the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC). It is designed to improve the ability of nations to cope with a sudden emergency, such as a tanker accident. The convention requires member states that have not yet established a national system for emergency oil spills at sea to do so as soon as possible (MOC 1996).

On this backdrop, in the period 1992-1995, oil spill contingency plans were developed for the six biggest harbours in China (Dalian, Tianjin, Shanghai, Ningbo, Xiamen and Guangzhou), with assistance from the World Bank (Pu 1997).<sup>78</sup> Emergency plans for oil spills on board have been put into practice on both international and national shipping routes from 1996 onwards. However, regional plans and an overall national plan for managing oil spill emergencies are still pending, and most harbours lack proper monitoring technology and human resources. At

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<sup>77</sup> "Special forces should tackle oil spills", *China Daily*, 23 October 1998. An article in *People's Daily* ("China Implementing Program Against Maritime Oil Spill", 25 April 2000, URL: [http://english.peopledaily.com.cn/200004/25/eng20000425\\_39594.htm](http://english.peopledaily.com.cn/200004/25/eng20000425_39594.htm)) (20 January 2001) states that 29,000 tons of oil leaked out in 53 serious accidents in China 1973-1999. While this unfortunately illustrates the quality of Chinese statistics, the point is still valid.

the time of writing, Shenzhen is the only harbour in China experimenting with regulations aimed at preventing and/or coping with oil disasters. What measures to take and what sanctions to impose to whom in the case of oil pollution at sea in China are still not specified by laws or regulations.<sup>79</sup>

#### **4.2 Implementation effectiveness of Project 6-8: on the path towards success?**

The main question to be answered in this section is to what extent the planned outputs and expected effects of Project 6-8 have been achieved so far. This question needs to be answered in order to document the implementation status according to the criterion of implementation effectiveness. First, a summary of the project's progress is provided. Then, the implementation status of the project as of mid-1999 is summarised, in terms of correspondence with planned outputs and expected effects.

The marine pollution problems outlined above were the reason why the Ministry of Communications (MOC) proposed what was to become China's Agenda 21 Project 6-8, "Prevention and Control of Marine Oil Spills". The Priority Programme for China's Agenda 21 (PPCA21 1994) states that Project 6-8 is based on programme area 12E of China's Agenda 21, "Sustainable Development of Transportation and Communication".<sup>80</sup>

According to PPCA21 1994, the objective of the project is "to introduce technologies and facilities for establishing an emergency demonstration centre in the port of Qingdao, Shandong province, to recover small scale spills and control larger spills". This roughly corresponds to the definition of *expected effects*, one of two elements of effectiveness, the criterion for successful implementation status. Although this was not stated explicitly in the project description, another objective was that the project should be a pilot project, and that it therefore should serve as a model for similar projects in other coastal areas in China.<sup>81</sup>

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<sup>78</sup> The MOC feasibility study (1996: 8) states that Qingdao also has established such an oil spill contingency plan. This does not seem to be correct.

<sup>79</sup> "Special forces should tackle oil spills", *China Daily*, 23 October 1998.

<sup>80</sup> While no part of the thesis is directly based on this publication, it should be mentioned that I first wrote about the project

<sup>81</sup> All documents from the project negotiations refer to the project as a pilot project. Another reliable indicator that this was indeed an objective on the part of the implementing agency and the end user was that the final end user, Yantai Maritime Safety Superintendent Bureau, had established a separate "Office for the Model Project of Oil Spill Prevention from Ships", and this affiliation was specified on the cards of relevant YMSSB employees.

The other aspect according to which implementation effectiveness will be examined below is the *planned outputs* of the project – or the activities to be conducted in order to achieve the stated project objectives. The objectives of Project 6-8 were to be reached through:

- establishing an emergency management administration in the port of Qingdao;
- establishing an information system for oil spill emergency management;
- introducing and adopting spill prevention and management technology; and
- building capacity for prevention and control of oil spills.

The project was to be conducted by MOC, the port of Qingdao and relevant research and design agencies.<sup>82</sup> The estimated budget was 10 million USD, of which Chinese inputs were supposed to be 7 million USD. The remaining 3 million USD was expected to be external grants (1 million USD), mostly for capacity building, and soft loans (2 million USD), for introduction of technology, facilities and equipment.

The Bohai area – along which the project area is situated – is rich in fishery resources, as it is situated in the north temperate zone. Spawning farms for fish, shrimps and crabs are found in large numbers in the area. Oil spill accidents affect the production of salines, which not only are vital ingredients in the diet of the local population, but also an essential raw material for industry and science. When oil spills occur, the desalination of water stops, affecting industry's water intakes. Oil spills damage the esthetical environment along the shoreline, as well as curbing several types of tourism along the shoreline and on nearby islands (swimming, diving, rowing and fishing).

Four seas border China's Eastern coastline, namely the South China Sea, the East China Sea, the Yellow Sea, and the Bohai Sea, along which the project area is situated (see Figure 4.1 below). The Bohai Sea is 77,000 km<sup>2</sup>, has an average depth of 18 meters, and links up with the Yellow Sea through the Bohai Straits, only 57 nautical miles wide. Liaoning, Hebei and Shandong provinces and Tianjin municipality – all relatively well-developed in Chinese terms – encircle it. The Bohai Sea is one out of two priority areas for development of oil resources in China, and the only one offshore. It is the main oil-producing region in the country.

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<sup>82</sup> In the first stage of the process, before the project was included in CA21, Department of Science and Technology in MOC was in charge. Then the Department of Planning took over (interview G13).

Figure 4.1 Project area in perspective



Source: Lu 1990

On the surface, it seems that, contrary to what is the case in many other areas of international environmental politics, North-South environmental technology co-operation projects under the A21 framework should have every chance to create win-win situations. Countries in the North, in this case Norway, need markets for their growing environmental technology industry, while countries in the South, such as China, seek funding and increased environmental technology implementation capacity. And indeed, the Chinese and the Norwegians both seemingly had a strong interest in implementing the project.

The implementing agency on the Chinese side, MOC, forwarded the project idea itself. The MOC was eager to implement the project in order to come to grips with steadily worsening problems related to oil spillage from ships. Other possible motivations were perhaps the

revenue and prestige related to internationally funded technology co-operation projects, and because the pilot project could very well open for more (foreign) funds to similar projects in the future.<sup>83</sup>

There was also considerable interest for the project in Norway. The Norwegian Strategic Plan for Asia (*Asiaplanen*, 1994, see Knudsen 1995) singled out environmental technology as one of six priority areas in approaching the growth economies of East and Southeast Asia in the period 1994-99. A sector plan for the export of environmental technology to China was made. In the period 31 October-5 November 1994, a major Norwegian initiative was made to get a foothold in China's environmental technology sector. The initiative involved the participation of many Norwegian companies on a large environmental technology exhibition, and a number of high-level meetings (Weisz 1994). However, most importantly, the Norwegian Trade Council in collaboration with the Norwegian embassy in Beijing and the Administrative Centre for China's Agenda 21 (ACCA21) held a Sino-Norwegian Conference on Environmental Technology. The conference focused especially on the projects under China's Agenda 21. It concluded by proposing 4 project areas for further Sino-Norwegian co-operation, corresponding with project proposals in PPCA21 1994: water treatment (6-2B), crisis management (8-8A/B), storage of low radioactive nuclear waste (6-7), apart from the project on oil spill contingency (6-8) (see Appendix 10.3 for more details). According to Lunde *et al.* (1995: 63), the projects had a total export value of around 50 million USD.

Following the first CA21 international donor roundtable conference in 1994, it was decided that Norway was well positioned to assist China in implementing Project 6-8. Six or seven countries had shown interest for the project, and signed letters of intention.<sup>84</sup> One of the main reasons why the Norwegians were preferred was that Norwegian consulting firms and companies seemed able to provide both the necessary equipment to prevent and control oil spills, and the knowledge and organisational framework needed to make proper use of the equipment.<sup>85</sup>

The Norwegian government as well as the business community saw the Project 6-8 as a possible exhibition window to the potentially enormous market for oil spill contingency technology in China. The Norwegian state-owned oil company Statoil was about to become

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<sup>83</sup> See also interview G12.

<sup>84</sup> Interview G13.

<sup>85</sup> *Ibid.*

operator for the Lufeng 22-1 oil field in the Bohai Sea, and it would therefore be politically very favourable if Norwegians were involved in a project for prevention and control of oil spills in the same sea area.<sup>86</sup>

Kværner Water Systems, and later Frank Mohn Flatøy, has headed a Norwegian consortium negotiating on the central and local specification of the project with the local end user and the central institutional partner, MOC.<sup>87</sup> Preliminary meetings between the Norwegians and ACCA21 were held in November 1994. A site visit to the port of Qingdao was included. In February 1995, a workshop was held in Beijing, hosted by ACCA21 and MOC. Then, the Norwegian participants were informed that the project was changed from Qingdao to the city of Yantai, also in Shandong Province, and that the new end user would be Yantai Maritime Safety Superintendent Bureau (YMSSB).

After the Yantai project had been presented to the international community, and preparatory talks had been started with the Norwegian project group, it turned out that the project had not been properly approved by MOC's own Planning Department. The project was therefore delayed by 7 to 10 months.<sup>88</sup> In August 1995, NORAD approved an application from the Norwegian project group for funding to a prefeasibility study. Based on the Norwegian draft project proposal (NOSCA 1995) and Chinese project documents, a feasibility study was conducted by MOC (1996). The study was presented to the Norwegians 15-20 April 1996 in Beijing, followed by a trip to the project site in Yantai. The feasibility study was approved by MOC in August 1996. Then a joint project proposal was sent to the State Planning Commission for approval, which was given in September 1996. The project was thereafter put on MOFTEC's list of projects awaiting final financial approval (MOFTEC did not include the project in their lists at first as they claimed MOC's feasibility study was too poor, but did so the second time). Key persons on the Chinese side were invited to Norway. After the Norwegian bilateral aid authorities had stated their interest in providing grants for capacity-building and mixed credits for the purchase of equipment, MOFTEC asked the Export-Import Bank of China (EIBC) to examine the repayment capability of the implementing agencies.

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<sup>86</sup> Interview G3.

<sup>87</sup> Det norske Veritas, UNITOR, PETCON and SINTEF have also been actively representing Norwegian Oil Spill Control Association (NOSCA) in this project at different stages. NOSCA, founded in 1993, is a non-profit co-operative consisting of Norwegian pollution control authorities, business and R&D (research and development) organisations with the aim of joining forces to develop equipment and contingency planning for oil spill prevention and recovery and export these products worldwide.

<sup>88</sup> Interview G10.

In January 1997, the Norwegian project group met MOC and MOFTEC in Beijing to discuss a possible financial model for the project. At this time, prestige had run into the Yantai project for the Norwegian Government. Norwegian companies and institutions had been involved in four other CA21 projects as well. However, by the time the Sino-Norwegian negotiations on the Yantai project started, it was clear that these projects would either not be implemented or be implemented without Norwegian involvement, wasting both the time and resources of the institutions involved and Norwegian taxpayers' money invested in preparing the projects. Norwegian authorities, all the way from the "street-level" bureaucrat to the top leadership, went out of their way to get the Yantai project going. Even the Norwegian Prime Minister herself, Mrs. Gro Harlem Brundtland – also the chairperson of the Brundtland Commission whose work the Rio Summit and thus A21 is based on – engaged herself in order to get the project on track. According to one interviewee, she had made the Norwegian position – and frustration – crystal clear for SSTC Chairman Song Jian when he visited Norway in late 1996.<sup>89</sup>

On the basis of the results from the meeting in January 1997, NORAD agreed to postpone the project by one year, but made it clear that if no solution had been found within this time frame, the project would be terminated. MOC had stated that it wanted to guarantee for the project, but this was not acceptable for the EIBC.<sup>90</sup> It asserted that a government organisation like MOC could not guarantee for a loan, as it could very well change or be abolished. This had to do with the Guarantee Law, introduced in 1995. Another important reason, however, was the fact that MOC had major troubles repaying debt at that time (accumulated because of unfortunate dispositions on other international projects).

It is somewhat unclear how the process to obtain funding on the Chinese side progressed after this point. What we do know is that MOC hoped to obtain 4 million USD through the 9<sup>th</sup> Five-Year Plan for the project, and that this obviously did not work out as planned – at least not in first instance (see below).<sup>91</sup> Indeed, according to the summary from a meeting between NOSCA representatives and MOFTEC's Foreign Financing Administration in Beijing in January 1997, "[w]hat is the big problem now is that Bank of China does not know who is the

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<sup>89</sup> Ibid.

<sup>90</sup> Most of the information in this paragraph is from interview G10, but most of its contents have been confirmed by interviews G2, G3, G12, and G13.

<sup>91</sup> According to Høst (1994), "MOC has confirmed that they have allocated 4 million USD to the project. They also said that the project must be integrated in the 9<sup>th</sup> Five-Year Plan. The interpretation of this must be that the project now is included in MOC's budgets, but whether it actually gets money depends on the next Five-Year Plan (...) MOC's said they must send their input to the 9<sup>th</sup> Five-Year Plan in March 1995".

actual borrower – MOC in Beijing or Yantai Maritime Safety Superintenden[t Bureau]” (Sørbye 1997b).<sup>92</sup>

Neither MOC nor Yantai Maritime Safety Superintendent Bureau managed to come up with a funding solution satisfying EIBC. Another aspect of the discussions was the relationship between equipment and other elements in the technology co-operation package. NORAD offered a combined package of capacity building and equipment; however, the Chinese were not interested.<sup>93</sup>

Consequently, neither NORAD nor MOFTEC would approve the project. According to internal NORAD documents, MOFTEC suggested that the project be cancelled.<sup>94</sup> Therefore, 26 February 1998, the Sino-Norwegian co-operation was officially ended. Later that year, the Chinese government decided to finance the project from its own funds, without foreign loans. In August 1998, the hardware elements of the project were put out for international bidding. Norwegian companies took part, but lost out to British competitors.

In mid-1999, five years after the Sino-Norwegian negotiations started, the Yantai project was still not finished. It was to be completed in late 2000.

As should be obvious from the expected effects and planned outputs specified above, the judgement of the implementation effectiveness of the Yantai project wholly depends on how one defines technology. If technology were defined only as hardware, some of the conclusions below would not be valid. Part of the objective of the Yantai project was to introduce the *technologies* needed in order for the oil spill contingency demonstration centre to become operative. As the outputs planned in order to reach this objective included transfer of skills, knowledge and organisational elements as well as equipment, it is reasonable to use the broad definition of technology provided in Ch. 1 as a starting point and examine to what extent these strategies actually have been implemented.<sup>95</sup>

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<sup>92</sup> The quote also underlines the confusion as regards funding in another manner; it is referred to “the Bank of China”, while most sources confirm that the Export-Import Bank of China was conducting the examination of the implementing agencies’ repayment capabilities.

<sup>93</sup> For more details, see Sections 7 and 7.2.2.

<sup>94</sup> This is confirmed by internal reports from NORAD (1998) and the Norwegian Embassy in China (1998), and, indirectly, by interviewee G10 from MOFTEC.

<sup>95</sup> Admittedly, the project description in the 1994 Priority Programme for CA21 focused more on technology in the form of monitoring, identification, warning and recovery equipment than management and training aspects. However, it is stated that “there remains a wide gap between China’s capabilities and international (...) personnel training”, the need for “extensive maintenance” of oil spill management technologies is acknowledged, and a capacity building and training program formed one out of four components of the project. Among the mentioned benefits of the project, it was mentioned that China would “develop emergency response management capabilities”.

Even though this study was ended in mid-1999, before the project was completed, some relatively unambiguous tendencies can be found. First, in mid-1999, the hardware parts of the project largely seemed to be on the way towards completion. A site visit confirmed that the demonstration centre specified in the project description was more than halfway built. Secondly, the project might succeed – at least partly so – in its long-term development objective of solving specific problems in the site area *as well as* being a model for other ports as to how to handle oil spills. The Yantai project may thus lay the foundation for establishing an overall oil spill emergency response system in China's northern sea area (MOC 1996: 9-10, 13). MOC interviewees indicated that the project would be followed up by similar projects, as did Yantai Maritime Safety Superintendent Bureau (YMSSB).<sup>96</sup>

The implementing agencies emphasise that the Yantai project was to be a pilot project.<sup>97</sup> However, this is not clearly specified in the project description. Nevertheless, MOC interviewees argued that because of experience obtained from the implementation of the Yantai project among other things, MOC has seen the necessity of a *national* plan for oil spill prevention and control, and is currently developing it.<sup>98</sup> Projects resembling the one in Yantai are planned for the East and South China Sea, and YMSSB is supposed to communicate its practical experiences to representatives from these areas.<sup>99</sup> Leaders and other representatives from these two areas have already been invited to Yantai for preparatory meetings, and they will be invited to the review of the project when it is finalised.

Considering the central government's financial situation, the fact that MOC granted around 50 million renmimbi (RMB) for the Yantai project signalled strong commitment. However, according to YMSSB representatives, it seems unlikely that more investment from the Chinese government is forthcoming, as many other coastal areas do neither have equipment nor management systems for oil spill contingencies.<sup>100</sup> This means that the emergency response system in Yantai will be complete only through the help of foreign investments.

A less positive aspect of project implementation so far is that the Chinese implementing agency, MOC, to an increasing extent focused on technology as hardware at the cost of

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<sup>96</sup> Interview G12 and G13.

<sup>97</sup> Ibid.

<sup>98</sup> Ibid.

<sup>99</sup> Ibid.

<sup>100</sup> Interview G13.

capacity building.<sup>101</sup> There were no indications that the Sino-foreign R&D co-operation signalled in PPCA21 1994 had been implemented.<sup>102</sup> Therefore, Chinese industry, research and design institutes probably have not have obtained sufficient competence so far to implement follow-up projects without foreign assistance, even though considerable competence has been gained through the Yantai project. This is at least true for the prevention and control of large-scale oil spillage at sea. However, representatives of YMSSB have claimed that an organisational framework for oil spill contingencies is in place. They distinguish between five units *responsible* for protection of marine areas, as evident in the Law on Protection of the Marine Environment: the local environmental protection bureau, the local Maritime Safety Administration, the local Oceanic Bureau, the local fishery authorities, and the Navy. According to the interviewees, relevant personnel in these units have received training.<sup>103</sup>

The Norwegian interviewees did not believe that the Chinese have actually managed to establish a proper oil spill emergency system, including both planning and organisation.<sup>104</sup> The Norwegian project group (as well as NORAD) considered not only the hardware, but also skills and organisational-institutional elements (capacity-building) to be essential parts of project implementation. According to their experience, trying to implement oil spill prevention and control projects without considering this aspect would not yield success (NOSCA 1997, see also Ch. 7.2.2).<sup>105</sup> The objective of the Norwegian research group was to develop Chinese competence, knowledge and capability to handle oil spills (NOSCA 1997: 2). The strategy to accomplish this was to educate and train operative and scientific personnel; pursue scientific co-operation; conduct mutual R&D projects; and to develop contingency systems, contingency organisation, and technology. The Chinese believed the concessionary aid was for equipment, and not for paying more consultants. They also argued that Norway should not have any trouble funding the project, as they had already earmarked money for this purpose.

The project focus has been changed substantially, from a comprehensive co-operation project consisting of knowledge, organisation and equipment (or, in short: technology co-operation)

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<sup>101</sup> It should be noted that only the Norwegian interviewees emphasise this tendency. However, as almost all interviewees involved in the project on the Norwegian side emphasised this point, it is deemed trustworthy.

<sup>102</sup> The extent of Sino-foreign R&D co-operation envisaged in the project description in PPCA21 1994 is somewhat unclear. While numerous research tasks are specified (e.g. assessing the impact of oil spills on coastal and marine ecology, and “develop[ing] rapid and high precision spill identification technology”), very little funding is put aside for such activities in the project budget. However, the different drafts of the project proposal (see e.g. NOSCA 1995, 1997) were developed partly by Norwegian consultants and partly by these consultants in co-operation with the Chinese, and the final version was approved by MOC. This underlines the conclusion that R&D and not only equipment should be regarded as one of the planned outputs of the project.

<sup>103</sup> However, whether this is correct is questionable (see Section 5.1 for more details).

<sup>104</sup> It is obviously hard to judge the correctness of either the Chinese or the Norwegian claims, as the only real test for an oil spill emergency response system is an oil spill emergency happening near Yantai, after the completion of the project.

<sup>105</sup> Interview PNB1 and PNB8.

towards transfer of equipment only. As expressed by one Norwegian interviewee: “We offered a total system for oil spill contingency planning, however, the Chinese (...) did not understand the value of getting a total system. They really needed contingency planning, but only wanted to buy technology (...) The end user wants to show off the technology, not necessarily use it. The technology is a status symbol, and a means to enhance power and prestige, more than a tool.”<sup>106</sup>

A second point where the actual implementation status of the Yantai project differs from the objectives stated in the project description in PPCA21 1994 is its *geographic focus*. From being a project directed towards potential oil spill contingencies in the *harbour* of *Qingdao*, it became a project focusing more on oil spillage prevention and control *at sea*, outside *Yantai*. In the words of a YMSSB interviewee: “In Qingdao, the port was chosen as setting for the project. At the workshop in Qingdao, changing the focus of the project towards Beihai Sea was suggested.”

MOC and YMSSB interviewees gave several reasons for this change of project site. First, similar projects as the one suggested in Qingdao were already implemented in six other Chinese ports. Second, while private actors would be able to finance clean-up of port areas like Qingdao, such financing would be more difficult to obtain for projects focusing on oil spills at sea. As CA21 is a common undertaking, it was argued, one should concentrate on common property resources, one of them being the oceans. Third, given that the focus should be on oil spills at sea, Yantai is ideally situated for the project (according to MOC), as it is located at the mouth of Bohai bay (see Figure 4.1 above). It is situated next to Tianjin and Qinhuangdao harbours in the west, opposite to Dalian harbour in the north, bordering on Qingdao harbour in the south, and facing the Korean peninsula and Japan across the Yellow Sea. Fourth, a rescuing and dragging bureau under the MOC is already located in Yantai. Only three such bureaux exist in China – the other two are in Shanghai (east) and Guangzhou (south).<sup>107</sup> Fifth, two-thirds of the Chengshantou, Changshan and Laotieshan waterways are under direct control of Yantai Maritime Safety Superintendent Bureau (YMSSB), the specified end user of the project. Due to a combination of heavy traffic (220000 ships have been estimated by MOC to pass through the Chengshantou waterway this year), frequent fog, strong currents and the second strongest winds in China, the Chengshantou, Changshan and Laotieshan waterways and nearby

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<sup>106</sup> Interview PNBI8.

<sup>107</sup> Interview G12.

waters have experienced many spill accidents. Between 1984 and 1996, 15 major oil spill accidents occurred in this area (NOSCA 1997: 13-14).

The change of geographical focus for the project was closely linked to a *change of technological focus* – from oil spill technology adapted to oil spill prevention and control in ports to technology to prevent and control such spills *at sea*. Norwegian equipment for oil spill management and control is adapted to the harsh conditions of the North Sea, the equipment offered by the Norwegians is generally more robust than their competitors', and therefore better suited for conditions like those in Yantai. The downside, of course, is that this also makes such equipment more expensive. This suggests that the technology offered by the Norwegian vendors (and, obviously, their efforts to sell this technology) was another reason for the change of geographical as well as technological focus (see below).

However, while many Chinese interviewees denied this, there were probably two other reasons for the relocation of the project as well, which had less to do with geographical and technological aspects. The first was that Qingdao did not have a clear idea as to how to implement the project and where to get funding.<sup>108</sup> The second was that Yantai Maritime Safety Superintendent Bureau (YMSSB) lobbied to take over the project (see Section 5.2 for more details).

The last point where the actual implementation status of the project deviated substantially from the intended development of the project in terms of implementation effectiveness was the fact that the Sino-Norwegian co-operation was ended, and equipment bought from a British supplier instead. This may or may not have resulted in the Chinese buying lower quality equipment. However, far more important than the changed nationality of the equipment supplier is the fact that this marked the end of a Sino-Norwegian co-operation that could potentially have been long-term, focusing on all aspects of technology, and therefore beneficial for both parties in the technology co-operation.

An example: Part of the suggested Sino-Norwegian technology co-operation was the transfer of skimmers from a Norwegian vendor. According to Norwegian sources, these were larger than skimmers offered by other countries' vendors, and made of stronger materials. Therefore, they are more suitable for oil spill prevention and control at sea, which turned out to become the

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<sup>108</sup> Interview PNB11 and G10.

focus of the project.<sup>109</sup> However, the Norwegian vendor's skimmer cost 600,000 USD each, which is about double the price of many competitors. As long as this was a development aid project involving concessionary financing, this posed no problem. However, when the project was put out for bidding after the Sino-Norwegian co-operation had ended, the customer chose to buy a simpler skimmer from UK for about 200,000 USD. The reason was that the project budget for such expenses was only 1,5 million USD. In other words: because the Sino-Norwegian co-operation failed, and Norwegian concessionary financing failed to appear, the Chinese ended up with a product that was less suitable for the conditions in Yantai, and the Norwegians ended up without having sold any equipment whatsoever.<sup>110</sup> Nevertheless, the Norwegians were probably more disappointed with this development than the Chinese. The reason is that the Chinese end user probably regarded the Norwegians as just one in a number of potential equipment suppliers, while the Norwegians regarded the Yantai project as a very important window towards a potentially very large Chinese market.

While not directly relevant according to the definition of implementation effectiveness, another aspect of the project negotiations should be mentioned. In the description of Project 6-8 in PPCA21 1994, the portion of the funding coming from Chinese sources was stipulated to be 60%, in line with the general policy of CA21. However, in the project negotiations, the Chinese tried to include a larger portion of foreign funding compared to the Chinese contribution. For example, the distribution of funding suggested at a meeting between NOSCA representatives and MOC in Beijing in January 1997 was that the Chinese should contribute 3 million USD, while the Norwegian authorities would contribute 4,5 million USD (3 million in mixed credits, the rest as a grant) (Sørbye 1997a). This is very different from the budget included in the project description of Project 6-8 in the 1994 Priority Programme; here, the Chinese contribution is set at 7 million USD and the foreign contribution at 3 million dollars.<sup>111</sup>

### **4.3 Summary and conclusion**

Project 6-8 bears some promise in terms of learning effects to similar projects in other geographical areas. The demonstration centre facilities were not too far from being ready in

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<sup>109</sup> Interview B13.

<sup>110</sup> Ibid. It should be noted, however, that one interviewee (PNBI6) questioned whether skimmers adapted to heavy seas were actually necessary at the project site.

mid-1999, in line with the project objectives. The project's geographical and technological focus of the project has been changed, but this seems to have contributed to making the project more relevant for the end user as well as more suited to the equipment offered by the Norwegian suppliers, and thus could be considered an *improvement* rather than a deviation from original goals. Far more problematic, however, is the fact that knowledge, skills and organisational elements of technology co-operation have been given too little attention by the Chinese end user, and the Sino-Norwegian co-operation has been discontinued. This is problematic, because it may in turn result in poor capacity on the part of the involved organisations to implement similar projects in the future, and because the lack of focus on such aspects of technology makes it rather unlikely that the centre will perform its intended functions in an emergency situation.

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<sup>111</sup> The reason that total sums differ is that it was agreed to reduce the total size of the project somewhat without changing its focus.

“The 21st century faces three major problems: a rapidly increasing population, a shortage of resources and a deteriorating environment, and [we] should look to the sea for solutions.”

*Song Jian, former head of SSTC, now vice-chairman of the National Committee of the Chinese People’s Political Consultative Conference, and president of the Chinese Academy of Engineering*<sup>112</sup>

## **5 Empirical mapping of independent variables: Three organisational framework conditions**

This chapter provides an empirical overview of the independent variables that in the analytical framework were suggested to influence the implementation status of the Yantai project. The documentation follows the chronology of the analytical framework, starting with horizontal fragmentation, followed by vertical fragmentation and relative organisational strength, respectively.

The general argument in the analytical framework was that organisational framework conditions influence the implementation of environmental technology projects. This being the starting point, this empirical documentation cannot possibly focus only at the Yantai project as such. In order to appreciate the dynamics of the implementation process of the Yantai project, it is necessary to understand the role of the CA21 administration on a central level, as part of its mandate has been to “participate in the formulation and implementation of China’s Agenda 21 (...) [and to] assist in the co-ordination of international participation [in CA21 projects]”.<sup>113</sup> Another weighty reason for choosing such a scope is that the actors on programme and project level overlap to a considerable extent.

For all three variables, matters related to the CA21 administration and the issue area are structured separately, but within the same section. Due to the nature of the variables in question, the main focus in the empirical documentation of horizontal and vertical

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<sup>112</sup> Cited in Ministry of Land and Resources (2000a), “China to exploit its marine resources”, URL: <http://www.mlr.gov.cn/english/China%20to%20exploit%20its%20marine%20resources.html> (20 January 2001).

<sup>113</sup> For more details on the responsibilities of the Administrative Centre for China’s Agenda 21, see Section 5.3.

fragmentation will be on central-level actors, and these actors will be presented as rather unitary. However, these actors may also be regarded as agglomerations of numerous local-level actors. The empirical documentation of vertical fragmentation will naturally focus more on local-level actors.

### **5.1 Horizontal fragmentation**

The question this section is to answer is whether the implementation process of the Yantai project can be characterised as horizontally fragmented or horizontally integrated. The following indicators for extent of horizontal fragmentation were specified in Section 2.2.1:

- The number of actors involved in decisions related to the implementation of the Yantai project.
- The extent – if any at all – of competing and/or overlapping jurisdictions of the organisations involved in the implementation of the Yantai project.
- The extent – if any at all – of cross-sectoral co-ordination of initiatives between the governmental actors involved in the Yantai project, e.g. through meetings and information-sharing.

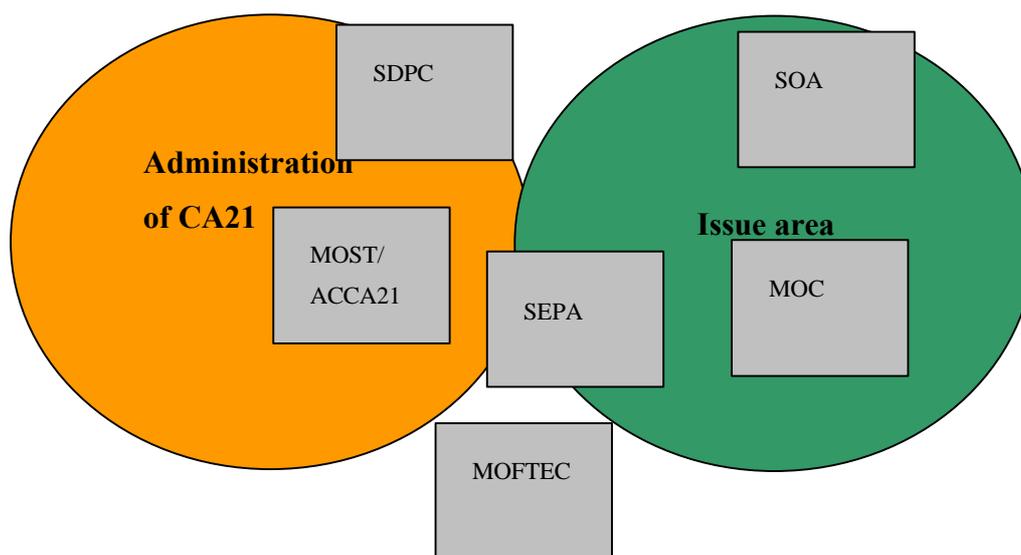
According to ACCA21, “China’s Agenda 21 (...) took into account the interests and plans of appropriate ministries, so as to make China’s Agenda 21 comprehensive, workable and more authoritative.” (ACCA21 1995a) However, in reality, the authority structures related to the central administration of China’s Agenda 21 (CA21) have been – and are – horizontally fragmented. This fragmentation has manifested itself in the following ways:

- The bureaucracies responsible for central planning are not sufficiently involved in the co-ordination of CA21.
- The environmental bureaucracy has been more or less left out of the CA21 process, and has implemented parallel – and, to some extent, competing – programmes.
- The division of responsibilities between the administrative centre for the CA21 and its priority projects on the one hand and the bureaucracies administering foreign financing of these projects on the other is unclear.

- Local Agenda 21 initiatives and CA21 priority project implementation have not been sufficiently co-ordinated on the central level.
- The agencies implementing CA21 priority projects do not to a sufficient extent co-ordinate the implementation of these projects with the CA21 administration.

The figure below shows the most important actors involved in CA21 administration and the area of marine oil pollution, respectively.<sup>114</sup> The closer a bureaucracy is placed to the middle of one of the two circles, the more influential it is in policy formulation and implementation within this field. However, the figure does not tell whether this area is too close to or far from the “core” of an organisation’s official jurisdiction, or to what extent the organisation itself claims “ownership” to the issue.

**Figure 5.1 Main bureaucratic actors involved in Yantai project implementation**



The process of drafting the CA21 White Paper bore every sign of horizontal fragmentation. The CA21 formulation process developed too quickly, according to many central observers (Pasztor 1993, Finamore and Holcombe 1994, Huang 1998). They claim this was a major cause

<sup>114</sup> This overview is not complete. A number of more peripheral actors that have been involved in the project have been left out, as including them would unduly complicate both the textual and graphic overview. Most actors have also been involved in the project at the local level, either directly or through their satellites at lower administrative levels. Among the main local bureaucratic actors involved in the project that are not on the figure, are the Yantai local government (including Mayor’s Office, Planning Committee, Economic Committee, Foreign Trade Committee and Environmental Protection Bureau one rank lower than the others); and Shandong Provincial government.

of the insufficient consensus building and integration between key actors in the implementation of CA21.

In the first draft of the CA21 White Paper, linkages between sectors, sources and impacts were largely ignored.<sup>115</sup> Each chapter was prepared by the line ministry responsible for the relevant issue. Consequently, in the chapters prepared by the economic and industrial ministries, only a small section on the environment was added, while the opposite was the case in the chapters drafted by environmental bureaucracies. The first draft was 2000 (!) pages, and contained a massive amount of historic facts instead of sustainable development strategies. The second draft was half the size of the first, and the participants had obtained a closer understanding of the relationship between sectors, sources and impacts. However, the industrial line ministries had responded to the call for cross-sectoral integration by merging their own chapters into one chapter, containing separate summaries of each ministry's former chapter. The third and final version was not perfect either, but contains many serious attempts at regarding issues in an integrated manner, which is an achievement in itself, considering the initial point of departure.

*Lack of involvement of planning bureaucracies in CA21 co-ordination:* According to Lunde *et al.* (1995: 58), the extent to which the CA21 priority projects were integrated in the 9th Five-Year Plan (1996-2000) would decide the success of CA21. However, in the opinion of one of the international consultants assisting China in the implementation of CA21 on behalf of UNDP, “[t]he [1994] Priority Programme was a real disappointment. The process of selecting priority projects did not seem to have any relation whatsoever to China’s Agenda 21. They were not even pretending that the projects were related to CA21, although it was fresh in everybody’s mind at the time. It was a real political process (...) the 62 priority projects were chosen on the grounds of distribution of benefits. In this process, SPC was only mentioned as lip service.”<sup>116</sup>

At the outset, the responsibility for the overall implementation of CA21 was to be shared between the State Science and Technology Commission (SSTC, now the Ministry of Science and Technology (MOST)), the State Planning Commission (SPC, now the State Development Planning Commission (SDPC)), and the National Environmental Protection Agency (NEPA,

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<sup>115</sup> This paragraph is building on Pasztor (1993), Finamore and Holcombe (1994), as well as Huang (1998: 18-19). Pasztor was the Chief Technical Advisor for UNDP’s CA21 Project; Holcombe was the UNDP Chief representative in China at that time; Finamore was one of the UNDP consultants reviewing the drafts; and Huang was a key person in ACCA21’s efforts to co-ordinate the drafting work.

<sup>116</sup> Interview N7. Finamore and Holcombe (1994) also state that a general lack of co-ordination between the Priority Programme and the White Paper is a serious flaw in China’s national follow-up of Agenda 21.

now the State Environmental Protection Administration (SEPA)). However, even though SDPC in theory shares the leadership of China's Agenda 21 with MOST, SDPC in practice regards the Administrative Centre for China's Agenda 21 (ACCA21) as MOST's centre. At a conference in 1999 on planning for the 21<sup>st</sup> century, hosted by SDPC, China's Agenda 21 was not mentioned with a word, until UNDP's residential representative in China, Ms. Kerstin Leitner, complained. This would never have happened if the conference were hosted by MOST.<sup>117</sup>

After the restructuring in 1998, the Director General of ACCA21 is directly appointed by MOST, which in practice has implied that the director of MOST's Department of Social Development is also the director of ACCA21. Most ACCA21 employees are recruited from MOST. The ACCA21 premises have been acquired from MOST's Beijing subsidiary.<sup>118</sup> The centre would also have had a hard time if MOST had not given it government-funded projects. "The source of the money defines power", as an ACCA21 source formulates it, referring to MOST.<sup>119</sup> The State Development Planning Commission (SDPC) and SEPA only to a very limited extent have provided centre with projects. This means that MOST has increased its control of ACCA21, at the cost of ACCA21's intended role as an interdepartmental centre.

*Environmental bureaucracy ostracised from CA21 formulation and implementation process and CA21 administration:* In Figure 5.1 above, SEPA was positioned as having organisational interests in both CA21 and the issue area of marine oil pollution. In fact, SEPA would probably regard both to be close to its "core business" – but are marginalised in both areas (for more details on the issue area, see below). Despite intense UNDP argumentation to the contrary, NEPA was largely kept out of the China's Agenda 21 process.<sup>120</sup> China's agency for the environment was thus more or less left out of a process meant to strengthen the country's focus on environment and development issues.<sup>121</sup> Lunde *et al.* (1995: 58) note that "[i]nterdepartmental struggle" has been taking place in the formulation phase, and that "key institutions like NEPA (...) [were] deliberately sidelined in the CA21 process". In the words of a SEPA interviewee, "NEPA thought that it should co-ordinate the whole [China's] Agenda 21,

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<sup>117</sup> Interview G4.

<sup>118</sup> Interview PNG4 and G4.

<sup>119</sup> Interview G2.

<sup>120</sup> For example, in UNDP's "Report on the Progress of the Project 'Formulating and Implementing China's Agenda 21'", attached to the first announcement of the First High-Level Roundtable for Agenda 21 in 1994 (SPC/SSTC/UNDP 1993: 2), it is stated that "[t]he State Planning Commission (SPC), the State Science and Technology Commission (SSTC) and the National Environmental Protection Agency (NEPA) will work together in the planning of fund mobilisation, scientific research and legislation concerning the implementation of the National Agenda 21".

<sup>121</sup> Interview N7, PGA4 and PGA5.

but SSTC thought they should be involved, as they were involved in environment and development”.<sup>122</sup> Another said, “[i]n the public, and as an organisation, SEPA supports CA21. But CA21 is under SDPC and MOST, so many officials within SEPA do not like that.”<sup>123</sup>

NEPA’s counterstrategy when being more or less excluded from CA21 was to disengage from the CA21 discussion and instead concentrate on legislation and bilateral treaties providing funding for its own projects. These projects were to some extent overlapping with CA21. However, at about the same time as CA21 was launched, NEPA initiated its own large-scale environmental project plan, called “China’s Trans-Century Green Plan”.<sup>124</sup> The CA21 project portfolio is much broader than that of the Green Plan, and the Green Plan has a different focus. However, its name (“Trans-Century...”) suggested NEPA wanted to show both its bureaucratic competitors and international donors that it was able to formulate and implement projects focusing on China’s challenges in the 21<sup>st</sup> century.<sup>125</sup> Furthermore, SEPA competes with CA21 for foreign funding, and there are obvious overlaps between the two project lists in the fields of solid waste, air pollution and water.<sup>126</sup> Finamore (1998: 4) regards SEPA’s Green Plan as an example that “[c]apture by one national organisation [MOST/ACCA21] leads to sabotage and parallel efforts by others”.<sup>127</sup>

Admittedly, assigning SSTC and SPC with the task of leading CA21 signalled to the international community that China’s top leadership took sustainable development seriously, and sustainable development initiatives need a broader institutional approach than that of an environmental agency. However, these arguments lose much of their idealistic flavour when power-political motives are taken into account.

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<sup>122</sup> Interview G5.

<sup>123</sup> Interview B16.

<sup>124</sup> See executive summary in NEPA (1997).

<sup>125</sup> Interview B15.

<sup>126</sup> Interview G4.

<sup>127</sup> By the term “Green Plan” is meant the “Trans-Century Green Plan”. The Green Plan also has been translated as “The Trans-Century Engineering Green Project Plan” or “The Trans-Century Green Project Plan”.

*“Who has the responsibility? In China, all ministries, departments, agencies and businesses say that they are the right ones to do exactly the job you want done. However, the fragmented institutional system, and the infighting between these actors, influences China’s ability to utilise new environmental technology in a negative way.”*

*Gunnar Mathisen, Environmental Councillor, Norwegian Embassy in China*

*Division of responsibilities ACCA21 vs. MOFTEC unclear:* In Figure 5.1 above, MOFTEC was the only organisation being placed outside both the circle illustrating the CA21 administration and that showing the area directly related to the project. While it is obvious that marine oil pollution is not MOFTEC’s “core business”, the fact that it has been almost completely left out of the administration of a large programme involving considerable amounts of foreign financing, to the benefit of an organisation set up only for this purpose (ACCA21), is extraordinary. According to Lunde *et al.* (1995: 68), “priority projects (...) have not been sufficiently anchored in the Ministry of Foreign Trade and Economic Co-operation (MOFTEC). Agenda 21 clearly falls into the category of projects that MOFTEC has to handle and approve.” The CA21 projects were assembled in the two Priority Programmes for CA21 in order to make them more appealing to foreign government institutions and private investors. However, the projects were not fully approved according to formal project procedures. MOFTEC was enraged because they claimed ACCA21 had kept MOFTEC out of the CA21 process. “MOFTEC should get funding to channel to ACCA21. If this funding goes directly to ACCA21, it means trouble”.<sup>128</sup> According to a very experienced senior official in MOFTEC, “official channels were neglected”.

MOFTEC was very sceptical towards the Yantai project in particular; not only because the financial aspects of the project were not clarified in advance, but because it was not approved within the MOC system. MOFTEC sources said that “[w]e warned our Norwegian counterparts about the problems, and told NORAD that this project would waste tax payers’ money, but they would not listen”.<sup>129</sup> Nevertheless, MOFTEC sources claim that the Yantai project was not treated different from any other project.

To the extent that MOFTEC has ever had a monopoly on the responsibility of listing projects for Sino-foreign co-operation, this monopoly has *de facto* been broken down and its position is

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<sup>128</sup> Interview G4.

<sup>129</sup> Interview G10.

contested. ACCA21 is not the only agency approaching foreign investors with a list of environmental projects they need funding for. A MOFTEC interviewee said “[f]oreign companies and governmental institutions can approach MOFTEC directly. We have a list of priority projects”.<sup>130</sup> However, so do SEPA, the Ministry of Construction, MOST, SETC, municipal governments, and environmental organisations, just to name a few actors.<sup>131</sup>

According to one interviewee, “ACCA21 was established out of a genuine wish to improve – but has almost been counterproductive, at least in the case of Norway (...) The reason was the organisational anchoring of the projects.”<sup>132</sup> As these projects were not handled through MOFTEC, it was harder to get hold of mixed credits, even though projects were good. Until 1998, MOFTEC controlled mixed credits projects. It was also involved in grant-financed projects, but had tough rivals in SSTC and SPC.<sup>133</sup> SDPC and MOST try to handle more and more projects directly with their foreign counterparts. This strategy, while potentially in the interest of both the foreign partner and the Chinese implementing agency, may very easily backfire, as MOFTEC or MOF has the power to delay and even stop the projects.<sup>134</sup>

Another area of responsibility that has only partly been sorted out between MOFTEC and ACCA21, is which agency that should be UNDP’s main counterpart in China. In 1993-94, UNDP wanted to strengthen ACCA21 by diverting more projects and more funding to the centre. This enraged China International Centre for Economic and Technical Exchange (CICETE), set up specifically by MOFTEC to be UNDP’s counterpart in China as early as in 1985. According to a MOFTEC source, the minister of MOFTEC, Wu Yi, protested directly to Deng Nan, responsible for ACCA21 within MOST. Under UNDP’s new resident representative, more projects have been diverted to CICETE again.<sup>135</sup>

*Lack of co-ordination between Local Agenda 21 initiatives and CA21 priority project implementation:* It is still not resolved which central-level bureaucracy should co-ordinate the Local Agenda 21 centres, leading groups etc. being developed in China’s provinces, municipalities and cities. According to a resolution from the State Council (China’s highest-ranking bureaucratic organ), ACCA21 is supposed to co-ordinate the implementation of Local

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<sup>130</sup> Ibid.

<sup>131</sup> Interview B15.

<sup>132</sup> Interview G3.

<sup>133</sup> This is confirmed in Sørbye (1997c).

<sup>134</sup> Interview G3.

<sup>135</sup> Interview G4. See also the discussion on lack of co-operation between CICETE and ACCA21 with regard to Local Agenda 21 co-ordination below.

Agenda 21s in Chinese provinces, municipalities and cities (ACCA21 1995a). However, partly because ACCA21 is not a separate government organisation, but *attached* to MOST, none of the LA21 centres seemingly report directly to ACCA21.<sup>136</sup> Instead, the centres have been integrated in or attached to different existing bureaucracies in different localities. Some LA21 offices are under the auspices of SEPA because they are hosted by local or provincial EPBs. Others are under the local science and technology commissions (e.g. under the Ministry of Science and Technology (MOST)), and yet some are under the local Planning Commission (e.g. under the State Development Planning Commission (SDPC)). For example, Benxi's LA21 centre is under the administration of the municipal EPB, and therefore is financed by the municipal government. Wuhan's LA21 centre is under the Municipal Planning Committee. In Shenyang, the responsibility for the LA21 centre is located to the local EPB. LA21 centres administered by local EPBs report to their local government, and – perhaps – to SEPA. The centre in Benxi sometimes reports to MOST, and sometimes to SEPA. This does not exactly facilitate co-ordination.<sup>137</sup>

Furthermore, UNDP has given China International Centre for Economic and Technical Exchange (CICETE, under MOFTEC) the responsibility for the implementation of pilot projects for development of Local Agenda 21s in Shenyang, Benxi, and Wuhan municipalities. Despite of this, CICETE has very little – or no – direct contact with ACCA21.<sup>138</sup>

CA21 projects have been or are implemented by a large number of different actors. Some projects were started long before Local Agenda 21 centres were established, and there seems to be few or no links between the Local Agenda 21 centres and the projects that are currently under implementation. As returned to below, this illustrates that priority projects are associated with the implementing agency, not Agenda 21. The Local Agenda 21 centres are integrated in different parts of the existing bureaucratic structure rather than the CA21 administration, and therefore do not function as comprehensive and co-ordinating agencies for CA21 activities in a given city or province.

However, a positive sign is that the Local Agenda 21 initiatives now seem to be co-ordinated with the already established pilot zones for sustainable development. These have their origins

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<sup>136</sup> Indeed, this is also an indication of vertical fragmentation, in the sense that ACCA21 only to a very limited extent controls what could be regarded as its lower-level replicates. However, I have chosen to highlight the horizontal fragmentation aspects here, as they are seemingly more dominant.

<sup>137</sup> Interview G4.

<sup>138</sup> This is confirmed by both ACCA21 and CICETE interviewees (interview G4 and G2, respectively).

in the experiences of Comprehensive Experimental Communities for Social Development, which were started as early as 1986 by SSTC, SPC, the State Commission for Restructuring Economy, and 20 other ministries under the State Council. In 1995, 18 national level and 40 provincial level pilot zones for integrated sustainable development had been established (ACCA21 1995a). “During the Ninth Five-Year Plan period, more of the priority projects will be implemented in existing and new national and provincial pilot zones for sustainable development”, ACCA21 (1995a) proclaimed in its report on the progress of CA21. Such co-ordination has unfortunately not been the case in the Yantai project. The Mupin area, within the borders of Yantai city, is one of the pilot zones for sustainable development. However, neither YMSSB nor MOC interviewees knew of the project (ACCA21 did, however).

*Lack of co-ordination between formulating and implementing agencies:* Other ministries regard ACCA21 as belonging to the Ministry of Science and Technology (MOST). As a result, according to one interviewee, they resist interference from ACCA21 in the implementation of the CA21 projects they have been assigned responsibility for.<sup>139</sup> ACCA21 interviewees have adapted to this view, although ACCA21’s mandate (as stated in CA21 documents) is rather broad. Says one: “[i]f our help is not wanted, we will withdraw from the project. We have too many other things to do, and after all it is their [the implementing agencies’] and not our projects.”<sup>140</sup>

Another indicator of the lack of co-ordination between actors formulating CA21 White Paper and those carrying out the projects that were to embody the ideas of this White Paper, is that the profile of the priority projects is not well co-ordinated with overall CA21 objectives. The profile of the Yantai project seems to result from two characteristics of horizontal fragmentation: lack of co-ordination, and consensus building. One possible reason why MOC was awarded the responsibility for the project even though it was obviously not too well prepared in advance (cf. the changing of project site and the problems involving financing) *could* be that this was the only project in the 1994 Priority Programme that MOC is responsible for.<sup>141</sup> Thus, the fact that Project 6-8 was selected could be regarded as part of a strategy to spread benefits from international co-financial and technological operation on as many actors as possible to maintain consensus and good relations (cf. Economy 1994).

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<sup>139</sup> Interview G10.

<sup>140</sup> Interview G2.

The accordance between the objectives of Project 6-8 and the objectives of CA21's Ch. 12E – to which the description of the Yantai project in the 1994 Priority Programme refers – is unclear, at best. Oil spill prevention and control is never explicitly discussed in Ch. 12E. In Ch. 14, on the other hand, especially section 14F on “Sustainable Development and Conservation of Marine Resources” (CA21 1994: 158-164), marine oil pollution is more explicitly dealt with, even though its focus is on the management and monitoring of fishery resources and marine natural reserves. For example it suggests “[b]uilding facilities at harbour areas to collect used oils (...) from ships” as one of three actions for protecting the marine environment (CA21 1994: 162, point 14.74). It is also stated that “China will continue to co-operatively study (...) sea area pollution control and management technologies, and the models for the forecast of oil spill drift movement” (CA21 1994: 164, point 14.77). While it has not been possible to confirm, Ch. 14 was probably drafted by SOA, with little or no consultation with other actors.

The introduction to the 1994 Priority Programme (PPCA21 1994: 1) ascertains that the basis for its formulation is “[o]verall strategy, programme areas of China's Agenda 21, and the foundation laid down by the previous work”. However, it is quite illustrating that searches for the terms “oil spillage” and “oil spill” in China's Agenda 21 (a 250-page document) – on which the PPCA21 1994 was supposed to be based – return no matches at all. The central topic of Ch. 12 in CA21 is how to achieve industrial reform and launch initiatives for sustainable development in industry, and secondly, to make the transportation and telecommunications sectors in China more effective in order to contribute to sustainable development. The environmental aspects of these two objectives, for example in terms of increased pollution, are only touched upon very briefly, and the environment and development dimensions are not treated in an integrated manner. Within the section on sustainable transportation and communications, highways, railways and aviation are the sectors most focused on. Marine transportation does not seem to be among the priority areas.<sup>142</sup> Therefore, a project focusing on marine oil pollution from ships does not seem to fit the framework of this chapter at all.

As regards the Yantai project in particular, it is located in the middle of nothing less than a bureaucratic minefield. The field of marine oil pollution policies and projects is characterised by fragmented, overlapping and unclear areas of responsibility, and, consequently, institutional

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<sup>141</sup> MOC proposed three projects – only 6-8 was chosen. The two other projects aimed to prevent explosions when storing coal powder at sea, and to prevent pollution when loading and unloading coal, respectively (interview G12).

<sup>142</sup> Ch. 12 does mention the need to “develop coastal marine transport” (12.71), to “[r]enovate old harbours to make use of their potentials” (12.76) and to “raise shipping standards” (12.77), however, these initiatives are all seen as part of an effort to make transportation more effective, and not as an environmental measure.

infighting.<sup>143</sup> The result has been conflicts and further environmental degradation. Everything from a “super marine ministry” to interministerial co-ordinating committees has been suggested to improve the situation (Lu 1990: 366, 376). According to the Marine Environmental Protection Law (MEPL, 1983), SEPA should be in charge of implementing it.<sup>144</sup> SOA has had the responsibility for pollution from development and exploration of offshore oil and the offshore dumping of waste. The Maritime Safety Superintendent Bureaux under MOC were to take care of pollution from ships. The State Administration of Aquatic Products of the Ministry of Agriculture is responsible for waste from ships in fishing ports, environmental departments of the Military handle waste by military ships, and provincial EPBs have been responsible for pollution from coastal engineering projects and pollutants from land sources (Lu 1990: 373). When technologies to avoid, monitor, control or remediate marine pollution are to be considered, even more actors become involved. Most of the above-mentioned ministries and agencies have their own marine science and technology development programs. So do the State Economic and Trade Commission (SETC),<sup>145</sup> and the Ministry of Science and Technology. China Corporation of Shipbuilding Industry, a ministry-level company, also has stakes in the matter, as does SDPC, in terms of planning and resource allocation.

The implementing agency in the Yantai project is MOC. However, it might just as well have been State Oceanic Administration (SOA) or SEPA, which seem to be the two other main bureaucratic actors within the field of marine oil pollution from ships. The division of responsibilities between these three bureaucratic actors in the field of marine environmental protection has never been quite clear. For example, SEPA is sometimes regarded as having comprehensive authority over marine oil pollution (see e.g. Pu 1997: 891), while MOC interviewees downplayed the role of SEPA almost completely.<sup>146</sup> Interviews with MOC officials at different levels also reveal vague conceptions of the division of responsibilities between SOA and MOC’s Maritime Safety Administration.<sup>147</sup>

MOC interviewees described a linear process from the point MOC sent the application for Project 6-8 to ACCA21 to a fully implemented project in Autumn 2000. However, a key

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<sup>143</sup> The central authorities also acknowledge this. See e.g. the article “Marine conservation atop State’s agenda” in the government mouthpiece *China Daily*, 8 June 1998.

<sup>144</sup> However, the MEPL was revised in 2000, and this directive seems to have been adjusted somewhat – see the discussion of SOA’s relative organisational strength in Section 5.3.

<sup>145</sup> SETC inherited the research portfolio of the Ministries of Petrochemical Industry, and Geology and Mineral Resources, respectively, after overtaking them in the 1998 government restructuring.

<sup>146</sup> Interview G12 and G13.

person that has worked at ACCA21 since it was established in 1993, who has been able to follow the project from the application stage, points to problems of overlapping jurisdictions and the possibilities of bureaucratic battles:

“There were problems in defining who should be responsible for the project. There is currently no legal framework specifying which institution should be leading in the area, and the division of labour between institutions, but the leading institution should be – and will be – the SOA. MOC had money and gave priority to the issue of emergency centres in harbours at that time, so they got the project”<sup>148</sup>

After years of bureaucratic infighting, contours of a *de facto* bureaucratic division of labour in this field could be detected before the 1998 restructuring: MOC had the jurisdiction over activities in harbour areas, while areas outside the harbour were considered to be the responsibility of SOA. SEPA and its local-level satellites mostly kept their activities onshore. In other words: when oil spills are still at sea, they are the responsibility of the local Maritime Safety Superintendent Bureau, on behalf of the central government. When the oil spillage from ships reaches the shore, it is the responsibility of the EPB on behalf of the local government. If offshore equipment other than ships is involved in the oil spillage, the local SOA has the main responsibility, on behalf of the Ministry of Land and Natural Resources. To my knowledge, it is not specified who has the overall authority in situation where two – or even all three – jurisdictions are being involved.

MOC, SOA and SEPA have launched overlapping and to some extent competing initiatives within the field of marine oil pollution. First, ACCA21 interviewees suggest that the Ministry of Communications (MOC) had plans for centres for marine oil spills before the inclusion of the Yantai project in PPCA21 1994.<sup>149</sup> They also suggest that Yantai was one of these centres, and that the project therefore confirms the suspicions of one interviewee that many CA21 projects were actually projects that were in the pipeline anyway, which were “repackaged” in order to obtain foreign funding. However, this is denied by MOC sources.<sup>150</sup>

Second, SEPA has also launched major initiatives in the field of marine environmental protection. NEPA’s own action plan for China’s Agenda 21 emphasised, among other things, natural resources conservation and environmental protection in oceans (ACCA21 1995a). In

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<sup>147</sup> Ibid.

<sup>148</sup> Interview G2.

<sup>149</sup> Interview G2 and G9.

<sup>150</sup> Interview G12 and G13.

autumn 1998, SEPA published a draft action plan to clean up the Bohai Sea within 2030 (Zhu 1998). The project supports SEPA's plan for "total amount control" of a series of major pollutants, including oil pollutants. The plan has aimed to reduce oil pollution to the level registered at the end of the 8th Five-Year Plan period within the end of 2000.<sup>151</sup> The draft action plan for the Bohai Sea suggested focusing on 13 cities around the Sea, among them Yantai. The draft also singled out ships and oil platforms (together with industrial enterprises) as the main polluters, which must meet national standards for pollutant discharge according to a specified time schedule.

However, the contents of the final version of the action plan, called "Turning the Bohai Sea Into the Blue Sea," published in September 2000, had seemingly changed. Although the use of the word "sea" in the title suggests a comprehensive project, the focus now seems to be more on restoring the environment *around* the Bohai Sea, than *in* it. Indeed, it is emphasised that the plan "will concentrate on bringing erosion-related pollution under control and improving the Bohai coastline", and that the emphasis should be on sewage treatment plants, tree planting and heavy industrial pollution.<sup>152</sup> Nevertheless, the plan has a total budget of over 7 billion USD. Furthermore, ships and offshore facilities are included in the plan, as is monitoring. Both these facts suggest conflict with MOC and SOA, respectively.

Third, The State Oceanic Administration (SOA) has implemented several projects overlapping with the Yantai project in terms of jurisdiction. For example, between 1994 and 1999, SOA conducted the "Maritime Pollution Prevention and Control Project in South Asian Maritime Space", in co-operation with UNDP, the Global Environment Facility and the International Maritime Organisation.<sup>153</sup> The project mostly focused on pollution at sea, just like the Yantai project, and it was a pilot project as well.

In 1996, SOA issued the "Ocean Agenda 21". In China's report to Earth Summit +5 (1997: 42) it is stated that "[e]arly in 1995, a common understanding on the principal strategy, objectives and countermeasures of China's maritime work in the 21<sup>st</sup> [c]entury was reached after several discussions organised by the State Oceanic Administration (...) attended by local governments

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<sup>151</sup> "The Plan for Total Amount Control of Major Pollutants Discharge in China During the Ninth Five Year Plan", URL: <http://www.zhb.gov.cn/english/plan/totalp-right.htm> (23 November 2000).

<sup>152</sup> See *ChinaOnline* 14 September 2000, <http://www.chinaonline.com/topstories/000914/1/B200090819.asp> (15 September 2000), and "Sixty Billion Yuan for Bohai Sea Environmental Protection", *People's Daily*, 31 July 2000, URL: [http://english.peopledaily.com.cn/200007/31/eng20000731\\_46895.html](http://english.peopledaily.com.cn/200007/31/eng20000731_46895.html) (31 August 2000).

in the coastal areas (...) [and] marine research specialists”. MOC and SEPA were not mentioned. The section on China’s Oceanic Agenda 21 continues by mentioning MOST, Chinese Academy of Sciences and the Ministry of Agriculture as “major governmental agencies involved in co-ordination of domestic oceanic efforts”. Again, neither MOC nor SEPA is mentioned. This indicates that little or no consultation had taken place with the other bureaucracies involved in marine sustainable development.<sup>154</sup> Xu (1998), a SOA researcher, mentions that “there are some other professional monitoring networks such as [the] networks of [the] transportation [ministry]”, but that these “are working on marine environmental monitoring for their special needs”. Implicitly, SOA heads the only comprehensive and impartial monitoring network.

According to SOA’s self-description, it is “the lead agency responsible for China’s ocean policy making and overall management”.<sup>155</sup> SOA’s self-perception, as being the leading agency responsible for China’s ocean policy making in general as well as supervision and management of the marine environment, is not in agreement with MOC’s and SEPA’s definitions of their own jurisdiction, especially as SEPA after the 1998 government restructuring has been supposed to play a co-ordinating role in national environmental policy.

Furthermore, SOA, on behalf of MLR (Ministry of Land and Resources), has taken charge of the further development of China’s oceanic environmental monitoring network. The network, initiated in 1986, is also to monitor oil spills. Given the fact that the press release published when the network was proclaimed a *national* network in 1998 stated that “[t]he development of oceanic environmental monitoring should abide by China’s Agenda 21 (...) and the China Ocean Agenda 21” (Liu 1998), it is interesting to note that, according to MOC interviewees, there has been little (if any) co-operation between SOA/MLR and MOC on the planning of the Yantai project.<sup>156</sup> This is somewhat peculiar – one would believe it to be in SOA’s interests to have MOC strengthening control of oil pollution because SOA is responsible for the country’s more than 60 oceanic environmental protection zones.

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<sup>153</sup> Ministry of Land and Resources, “Survey of China’s Marine Resources”, URL: <http://www.mlr.gov.cn/english/pMarine%20Res.html> (20 January 2001). See also “People’s Republic of China – Integrated Coastal Management Country Profile”, URL: <http://icm.noaa.gov/country/China.html> (20 January 2001).

<sup>154</sup> A reliable indication is that the MOC interviewees contacted had neither read or obtained the Ocean Agenda 21; said that MOC had not been co-operating with SOA in the development of its Ocean Agenda 21; and thought it was natural that each ministry and agency formulated its own action plan in order to follow up the CA21 initiative. According to two MOC interview G12, MOC should publish its an action plan of its own one of these days, if it has not already been published.

<sup>155</sup> Ministry of Land and Resources (2000), “Survey of China’s Marine Resources”, URL: <http://www.mlr.gov.cn/english/pMarine%20Res.html> (20 January 2001).

<sup>156</sup> Interview G12.

Furthermore, it would be natural for an agency responsible for monitoring of marine oil pollution and an agency responsible for preventing and controlling oil spill accidents to discuss matters of common interest, or co-ordinate their efforts to develop the marine safety infrastructure. Even more so when one of these has published an overall plan for sustainable development of ocean areas and the other is implementing a pilot project on oil spill prevention and control that it hopes to replicate in as many harbours as possible. It is also interesting to note that it took 12 years for SOA's environmental monitoring network to become officially approved, although SOA itself pictures the establishment of the network as a joint effort of "over 100 departments", among them "environmental protection, communication, ocean water conservancy, aquatic production and [the] military".<sup>157</sup>

Horizontal fragmentation has also played a role on lower territorial levels. The Bohai Sea borders Liaoning, Hebei and Shandong provinces, as well as Tianjin Municipality. One of the main reasons why SEPA has initiated its campaign to clean up the Bohai Sea is probably that there has been a lack of co-operation between the cities and provinces surrounding the sea in the field of marine pollution prevention.<sup>158</sup>

The division of responsibilities in an emergency situation between YMSSB – being directly under the central government – and the local government, seem vague. As mentioned in Section 4.2 the MEPL divides responsibility for protection of marine areas between the EPB, the Maritime Safety Administration, the Oceanic Bureau, and the fishery authorities in a locality, in addition to the Navy. Relevant companies, port authorities, and search and rescue centres also will have to participate if an emergency occurs. Different units control the equipment necessary for handling oil spill emergencies, but according to the YMSSB interviewee, they can be mobilised in a co-ordinated way. However, the same interviewee both said that "the local government (...) is in a commanding position", and that "[I]f there is an oil spillage accident in this area, emergency action will be co-ordinated from this centre". As the centre is established under the authority of YMSSB, this definition of authority structures seems at best unclear; who is in charge when an oil spill occurs outside Yantai – YMSSB, or the local government?

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<sup>157</sup> SEPA (2000), "Oceanic Administration Departments' Implementation of CBD [the UN Convention on Biological Diversity]", URL: [http://www.sepaic.gov.cn/biodiv/devt\\_imp\\_en/ocean\\_dept.html](http://www.sepaic.gov.cn/biodiv/devt_imp_en/ocean_dept.html) (20 January 2001).

ACCA21 has made attempts at cross-sectoral co-ordination of initiatives between the governmental actors involved in the Yantai project. After the project was listed, but before Norwegians were introduced to the project, ACCA21 convened research institutions, government and industry (MOC, SOA, research institutes under MOC and SOA, and China National Offshore Oil Corporation, among others) for a policy dialogue.<sup>159</sup> These actors did not convene to discuss the Yantai project in particular, but to discuss International Petroleum Industry Environmental Conservation Association's experiences with oil spill emergency response. According to ACCA21, such meetings were held for very few of the other CA21 priority projects – in other words, it is no reason to believe that the Yantai project is a negative exception to the rule regarding interministerial co-ordination.

On a general level, another initiative from ACCA21 to promote cross-sectoral co-ordination in the implementation of CA21 is the China's Sustainable Development Networking Program (CSDNP). It is connected to a large international network, established as a consequence of Agenda 21. CSDNP's objective is to promote the sharing of information between government agencies, academic institutions, enterprises and non-governmental organisations and the public via Internet, and develop information services facilitating the implementation of CA21 and the priority programmes both nationally and on the local level (Finamore and Anwar 1993).<sup>160</sup> Information sharing and co-ordination has increased because of CA21, but that there is a lack of information sharing culture among Chinese bureaucracies, and that such a culture cannot be changed overnight.<sup>161</sup> Huang (1998: 22) notes that “[t]he implementation of CSDNP has faced the dual challenge of meeting the extensive information requirements from each central ministry and local government bodies while also overcoming the obstacles which presently prevent such information exchanges”. One of the international consultants who reviewed the project description for this project was sceptical towards its feasibility, but added, “on the other hand, one has to start somewhere”.<sup>162</sup>

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<sup>158</sup> The central authorities acknowledge the lack of interprovincial co-ordination. For example, in the article “Special forces should tackle oil spills” in the government mouthpiece *China Daily* 23 October 1998, Wang Hongsheng, chief of the Ship Safety and Environment Protection Division of Ningbo Maritime Safety Bureau under the Ministry of Communications says that “[c]o-operation between different regions and provinces is still weak when it comes to dealing with leakage emergencies (...) [i]t can lead to disastrous sea pollution.”

<sup>159</sup> There seems to have been at least one more initiative from ACCA21 for interministerial co-ordination related to the Yantai project, although ACCA21 interviewees did not mention this. In a fax to Norwegian actors in Project 6-8 dated 23 September 1994, Liu Peizhe (then director general of ACCA21) wrote that “we [ACCA21] are organising and co-ordinating relevant sectoral and local agencies to feather the preparation of the project in order to work out a concret[e] and practical project proposal”.

<sup>160</sup> ACCA21 (1995c) “China's Sustainable Development Networking Program (CSDNP): Feasibility Study”, URL: <http://www.acca21.edu.cn/scnfsc1.html> (20 September 1999), ACCA21 (1995d) “United Nations Development Programme - Project of the Government of the People's Republic of China”, project document, URL: <http://www.acca21.edu.cn/schinapr.html> (20 September 1999).

<sup>161</sup> ACCA21 (1995c), “China's Sustainable Development Networking Program (CSDNP): Feasibility Study”, URL: <http://www.acca21.edu.cn/scnfsc1.html> (20 September 1999).

<sup>162</sup> Interview N7.

To summarise, the implementation process of the Yantai project has in fact *not* included so many actors. MOST (ACCA21) has been the most important on the central administrative level, while MOC (YMSSB) has been the key actor in the project issue area as such. In direct opposition to the argument underlying the choice of the number of actors as a criterion for horizontal fragmentation, the problem seems to be that too *few* actors are included in implementation processes, rather than that too many actors are involved.

This is because the division of responsibilities between different bureaucracies involved in or related to the Yantai project is unclear, the jurisdictions of these organisations overlapping, and – consequently – the level of interministerial conflict rather high. This is true both for the organisations related to the co-ordination of the CA21 projects centrally, and the bureaucracies related to the field of marine oil pollution. Some of the conflicts were not fully resolved by the 1998 central government restructuring. The CA21 administration’s half-hearted attempts to co-ordinate relevant actors in the issue area have only had very marginal effects.

## **5.2 Vertical fragmentation**

Can the implementation process of the Yantai project be characterised as vertically fragmented or vertically integrated? The indicators according to which the question is to be examined are the extent of co-ordination between different levels of the implementing organisations, and the relative influence of these bureaucratic levels in project implementation. The documentation will concentrate on processes between different levels of the main implementing agency, MOC. The central-local relationship within the CA21 administrative structure will also be touched upon.<sup>163</sup>

Below, it will be argued that the implementation of the Yantai project has been characterised by vertical fragmentation, for the following reasons:

- The project implementation process has been top-down initiated, and therefore has not been anchored locally to a sufficient extent.
- There is a lack of a clearly defined CA21 administrative structure on lower levels of government.

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<sup>163</sup> However, this was indirectly covered through the discussion on the fragmented authority over the Local Agenda 21 bureaucracies in Section 5.1 above.

- Local-level actors have their own agenda, separate from that imposed on them by central-level bureaucracies.
- Several of the Ministry of Communications' subsidiaries have rivalled to become the site of the Yantai project.
- The distribution of responsibilities between central and local levels related to project financing has been vague, and therefore open for negotiation.

*Top-down initiated project process – lack of local anchoring:* It has frequently been claimed that proposals for PPCA21 1994 projects came from central as well as local levels. However, it seems that most proposals came from central level organisations, and that these organisations had not co-ordinated their efforts too well with the local level bodies on which they would depend in order to implement projects successfully. The Yantai project was no exception in this regard. 15-19 April 1996, more than one and a half years after YMSSB had its first meeting with six representatives from NOSCA, in Beijing. All the previous meetings had been held between NOSCA and central-level authorities.

The Norwegians had expected that since the Yantai project and the other Sino-Norwegian co-operation projects under CA21 were priority projects, they would be well prepared. However, the CA21 priority projects had neither gone through prefeasibility studies nor feasibility studies before they were presented in PPCA21 1994. This came as a surprise for the Norwegian companies and consultants. Sverre Bergh Johansen, then Norwegian Ambassador to China, clearly uttered the Norwegian discontent with the Sino-Norwegian co-operation projects in a speech at the opening ceremony of the “Second High-Level Roundtable Conference on China’s Agenda 21” (Bergh Johansen 1996: 76):

”...after almost three years and high costs for the companies involved, very little progress has been made in the realisation of the projects. Our experience from these projects leaves the impression that the projects were approved more as a whole programme than at the level of each individual environmental project. It seems that the projects have to be approved by the different Chinese authorities just as any other project. I think it was expected that the projects were more mature and elaborated when they were introduced to the international community in 1994.”

This message could not be misunderstood. It was among the extremely few critical words uttered at an occasion inviting for the praising of past efforts as well as discussions on future co-operation rather than the critical evaluation of past and ongoing projects. However, the

Norwegians did not seem to have realised that although SSTC and SPC (who spearheaded the CA21 programme) were powerful supraministerial commissions, they did not have the mandate to guarantee for the implementation of every single priority project. This was particularly the case with projects whose successful implementation hinged upon the active participation of other ministries' local-level actors, with whom they had varying degrees of contact and control. The Yantai project is a good example of this.<sup>164</sup> Thus, as pointed out relatively early in the CA21 implementation process by Lunde *et al.* (1995: 58), the Agenda 21 strategy has “so far not [been] well integrated at the provincial and local levels”.<sup>165</sup>

*No clearly defined CA21 administrative structure on lower governmental levels:* One aspect of the lack of CA21 anchoring on the local level, is that ACCA21 does not have a well-defined and well-established structure of bureaucratic satellites at the provincial and local levels on which to depend in following up the local implementation of CA21 projects. However, this will not be elaborated on further in this section.<sup>166</sup>

*YMSSB's separate agenda:* Even clear weaknesses in terms of co-ordination between MOC centrally and YMSSB have been pointed to in this section, the central bureaucracy generally seems to be able to control its satellite in Yantai. MOC has a leadership relationship (*lingdao guanxi*) to YMSSB, which for example implies that MOC provides YMSSB's funding, controls its number of staff, and may make other organisational changes if deemed necessary (see below). YMSSB and MOC sources have both said jokingly that part of the reason why the Yantai project in their opinion was being successfully implemented was the project's feminine profile. The initiator in MOC's Science and Technology Department, Department of Planning, the chief engineer at the Planning and Design Institute as well as the person in charge of YMSSB during most of the implementation process have all been women.

A restructuring of the marine safety administrative apparatus in 1998 has seemingly strengthened MOC's central-level authority in the field, at the cost of local governments. Before 1998, most harbours had one safety supervision agency directly under MOC, and one under the local government. In this period, the end user of the Yantai project, Yantai Maritime

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<sup>164</sup> To illustrate the difference between two CA21 priority projects: The Yantai project (implemented by MOC and dependent on MOC's subsidiary in Yantai for success) has run a risk of not being successfully implemented, e.g. because it is detached from the “implementation centre”. The establishing of the Centre for Environmentally Sound Technology Transfer in the premises of ACCA21, owned by SSTC which also leads the CA21 programme, is much more likely to be implemented successfully.

<sup>165</sup> This was also pointed out in interview PNBI1.

<sup>166</sup> For more details, see discussion on the fragmentation and overlapping responsibilities related to the administration of Local Agenda 21 administration and initiatives in Section 5.1 above.

Safety Superintendent Bureau, was in charge of marine safety matters. It was under MOC's direct authority, meaning that MOC appointed its employees and financed its operations. It also received guidance from local authorities, although it did not have much contact with the local government.<sup>167</sup> Yantai Harbour Authority (YHA), on the other hand, was the local government organ responsible for loading, unloading, and management of the harbour, and only received guidance from MOC. However, in November 1998, the China Maritime Safety Administration (CMSA) was established. The restructuring meant that YHA and YMSSB merged to one agency, under the direct leadership of CMSA. CMSA has also initiated a program against maritime oil spills, both at a national level, and for each of the major sea regions (the North China Sea, the East China Sea, the South China Sea and the Taiwan Straits).<sup>168</sup> Clearly, this has strengthened MOC's authority over marine safety and marine pollution. The pre-1998 system had obvious weaknesses. "The overlapping set-up has caused ever-increasing problems in (...) environmental protection, law enforcement and sometimes (...) extra fee-charging", the CMSA said in a remarkably open-hearted document published in *China Daily*.<sup>169</sup> Most coastal agencies were reorganised at the end of 1999, while those related to inland waterways lagged somewhat behind.<sup>170</sup>

Nevertheless, before the restructuring, YMSSB had its own agenda. It was not only MOC's bureau in Yantai, but also competed with MOC bureaux in other cities along the coast for resources and prestige. According to a YMSSB interviewee, it aimed to become the locus of preparations for oil spill contingencies in the Beihai (North Sea) area.<sup>171</sup> The local representatives have also viewed the project as part of a strategy to position YMSSB to become a central actor in China's follow-up of China's obligations towards the International Maritime Organisation (IMO) – and the OPRC Convention in particular. Their hope has been that a training base in co-operation with the IMO secretariat for the Pacific Asia area will be placed in Yantai.<sup>172</sup> Obtaining CA21 Project 6-8 was an excellent first step towards strengthening YMSSB's responsibility for co-ordinating oil spill emergency operations in the Beihai (North Sea) area.

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<sup>167</sup> Interview G13.

<sup>168</sup> See "China Implementing Program Against Maritime Oil Spill", *People's Daily*, 25 April 2000, URL: [http://english.peopledaily.com.cn/200004/25/eng20000425\\_39594.htm](http://english.peopledaily.com.cn/200004/25/eng20000425_39594.htm) (20 January 2001), and "China's First Oil Spill Emergency Programs Take Effect", *People's Daily*, 4 April 2000, URL: [http://english.peopledaily.com.cn/200004/04/eng20000404\\_38267.htm](http://english.peopledaily.com.cn/200004/04/eng20000404_38267.htm) (20 January 2001).

<sup>169</sup> Cited in "Marine safety and prevention of pollution given new emphasis in China", *The Bunker Bulletin*, 1 March, 1999, URL: [http://www.bunkerworld.com/news/archive1qtr\\_99/bullet\\_010399\\_1.htm](http://www.bunkerworld.com/news/archive1qtr_99/bullet_010399_1.htm) (20 January 2001).

<sup>170</sup> See "China sets up first maritime safety administration", *Chinaenvironment.com*, 19 June 1999, URL: <http://www.chinaenvironment.com/english/news/june99/0619marine.htm> (20 January 2001).

<sup>171</sup> Interview G13.

<sup>172</sup> *Ibid.*

*Rivalling subsidiaries:* However, several other similar bureaux in the Northern Sea area have aimed for the same position. Therefore, behind the scenes, there has been considerable competition between different marine safety bureaux – and port authorities – to get the CA21 Project 6-8. According to the leader for the implementation of the Yantai project at YMSSB, “[e]verybody’ wanted the project (...) Maritime Safety Bureaux in Qingdao, Dalian and Tianjin – all [harbours] related to the Beihai area – and even Yantai Harbour Authority”.<sup>173</sup> As mentioned in Section 4.2, Yantai Maritime Safety Superintendent Bureau (YMSSB) lobbied to take over the project. The current leader of the Yantai project at YMSSB confirmed that the suggestion to change the project site from Qingdao to Yantai came from her.<sup>174</sup> Other interviewees confirm that “Beidaihe was also a relevant site for the oil spill contingency planning centre placed in Yantai – especially because China’s top leaders spend their holidays on the beaches there”,<sup>175</sup> and that “[i]n the beginning, both Nanjing, Zhuhai, Dalian, Qingdao and Yantai all wanted the centre to be in their place. They tried through their own relations to influence MOC”.<sup>176</sup>

It should be noted here that only three-quarters of the specified project area is under the jurisdiction of the Yantai Marine Safety Superintendent Bureau area (MOC 1996) – the rest is under the corresponding agency in Dalian, which does not figure among the implementing agencies of the project.

Another area where YMSSB has had a different agenda than MOC centrally is the *techno-organisational profile* of the Yantai project. YMSSB has been far more hardware-oriented than MOC, which took a more comprehensive perspective of the project (see also Section 7.2.2). While MOC agreed with the Norwegian representatives that capacity building should be an important aspect of the project, YMSSB pressed on for more focus on equipment. According to a Norwegian interviewee, “MOC’s local department in Yantai defined what they should do themselves. MOC centrally tried to control them, but could not. Yantai wanted to press activity towards equipment, and do the planning themselves.”<sup>177</sup> Another agreed: “MOC and Yantai said different things to us (...) The difference in interests was most profound in the beginning of our engagement, in 1994 – after all, this problem became smaller later on in the project

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<sup>173</sup> Ibid.

<sup>174</sup> Ibid.

<sup>175</sup> Interview B13.

<sup>176</sup> Ibid..For more details of possible strategies employed by the harbours competing for the Yantai project, see Section 7.2.1 below).

<sup>177</sup> Interview PNB11. See also Section 7.2.2 below.

negotiation process. However, what was consistently unclear was the distribution of power between local and central authorities.”<sup>178</sup>

*Financial distribution of responsibilities vague:* The point where this distribution of power between YMSSB and MOC perhaps has been most unclear and the differences between the two have been largest, has been project financing. MOC sources claimed YMSSB sought financing from local companies, but that this turned out to be impossible. However, the YMSSB representatives said that they had never made contact with any local banks or other agencies for financing. One of the reasons they gave for this was that “[t]he Ministry of Communications is supposed to finance the project”, and therefore should “negotiate with MOFTEC at the national level”.<sup>179</sup> It therefore seems that the central and local level does not agree on where funding should come from.

The co-ordination between MOC centrally and its subsidiary in Yantai in terms of meetings and the sharing of information has been reasonably good so far. Furthermore, MOC’s central control seems to have been strengthened after the establishing of China’s Maritime Safety Administration under MOC in Beijing, and the consequent merging of the Yantai Maritime Safety Superintendent Bureau and Yantai Harbour Authority. However, YMSSB has had its own agenda: it has i) competed with other harbours to become the site for CA21 Project 6-8 in order to obtain a more central position in marine safety work in the North China Sea; ii) pushed the financing responsibilities for the project upwards to MOC centrally; and iii) lobbied for a higher hardware content in the project. As it has so far succeeded along most, if not all, these dimensions, it is reasonable to conclude that its relative influence on the implementation of the Yantai project has been unproportionally large compared with that of MOC centrally. The CA21 administration, on the other hand, has had limited ability to influence the course of the project; it has so far not established a separate bureaucracy on lower administrative levels like the city of Yantai.

### **5.3 Relative organisational strength**

In the analytical framework, it was suggested that the organisational strength of implementing organisations compared to their opponents would become important for implementation of

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<sup>178</sup> Interview PNBI8.

environmental technology projects if implementation of these projects were to be characterised by horizontal and vertical fragmentation of authority. As seen above, the implementation process of the Yantai project has been marked by such fragmentation. This section is to examine whether or not the agencies implementing the Yantai project are organisationally weaker or stronger than their opponents, in terms of administrative capacity (personnel), jurisdiction, rank, and network (national and international organisational linkages).<sup>180</sup>

On an administrative level, the successful implementation of China's Agenda 21 and its priority projects hinges on the relative strength of its proponents on the administrative level. The most important is the *Administrative Centre for China's Agenda 21* (ACCA21), under the *Ministry of Science and Technology* (MOST). Scepticism towards China's Agenda 21 has been found most clearly in the State Development Planning Commission (SDPC),<sup>181</sup> the State Environmental Protection Administration (SEPA) and the Ministry of Foreign Trade and Economic Co-operation (MOFTEC). While calling the latter opponents may not be correct – they have all taken part in projects under China's Agenda 21, and SEPA has published its own sectoral Agenda 21 – their goals have often been counter to the further strengthening of China's Agenda 21. Therefore, in order to understand the factors influencing the implementation status of the project it is necessary to assess the relative strength of ACCA21/MOST on the one hand and SDPC, MOFTEC and SEPA, respectively, on the other.

The role of ACCA21 is evolving. Until 1997, the centre was more of a national secretariat for the daily administration of CA21. Its activity was focused at the follow-up of priority projects, and key events like the working group meetings during the formulation of China's Agenda 21, the two roundtable conferences in 1994 and 1996 to attract donors for CA21 priority projects, and the 1997 National Report to the Earth Summit +5. While still having such a function, ACCA21 is becoming more and more of a service centre, and its focus has been moved from the co-ordination of different ministries' efforts at the national level more towards the local level, and towards particular industries.<sup>182</sup> However, ACCA21 suffers from being dependent on other agencies for funding. According to one source, "ACCA21 had no money. [It was] very

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<sup>179</sup> Interview G13.

<sup>180</sup> Conclusions on different actors' relative organisational strength obviously depend on comparisons between the documented values for each of the other bureaucracies involved in CA21 administration and the issue area of marine oil pollution, respectively; therefore, conclusions will be summarised at the end of the section instead of the beginning. It should also be noted that the number of personnel given below should only be taken as approximate indications. One of the reasons is that many organisations have numerous affiliates whose relations to the mother organisation can often be rather vague (see Ch. 8.2.1).

<sup>181</sup> This may seem paradoxical, as the then SPC was initially assigned responsibility for the formulation and implementation of China's Agenda 21 together with SSTC. However, the scepticism has to do with the fact that SSTC (now MOST) gradually took over the control of China's Agenda 21.

<sup>182</sup> Interview G2.

weak (...) One of its [ACCA21's] tasks should have been finding eligible financing for the CA21 priority projects through contacting the end user and the local bank, but it has not been able to do so."<sup>183</sup>

The ACCA21 staff – which counts around 20 people, including the Centre for Environmentally Sustainable Technology Transfer (CESST, see below) – is known for being “capable and efficient”, but they also seem to have been known as being somewhat “arrogant and aggressive”.<sup>184</sup> ACCA21 has also suffered from a reputation of having inexperienced employees – quite natural for a newly established unit. ACCA21 interviewees admit this as well:

“We were not that experienced in the beginning. We were not able to judge whether the suggested projects were appropriate for Norwegian technology. Now we have learned some lessons”<sup>185</sup>

ACCA21 is responsible for “co-ordinating the implementation of China’s Agenda 21 and the Priority Programmes” (ACCA21 1995a). However, the formulation and follow-up of priority projects is only one part of ACCA21’s responsibilities. Only one of ACCA21’s subdivisions is responsible for this. Thus, ACCA21 obviously does not have the necessary organisational strength to keep control over a plethora of actors implementing CA21 projects. “We keep out of projects because do not have capacity and because it is not our task to control implementation”, says one ACCA21 interviewee. The problem, then, is no other organs monitor CA21 implementation either – apart from the implementing agencies themselves.

In contrast to what was stated by the ACCA21 interviewee above, ACCA21’s official mandate *is* to monitor (and, to some extent, evaluate) CA21 progress, in addition to fund-raising, and technical assistance if needed. ACCA21 was originally under SSTC’s Department of Science and Technology for Social Development, and is now under MOST’s Department of Rural and Social Development. According to ACCA21 interviewees, even though ACCA21 has department-level status, it needs a major liaison department like the Department for Rural and Social Development in order to have enough political clout.<sup>186</sup>

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<sup>183</sup> Interview B16. However, to my knowledge, locating eligible financing has not been among the responsibilities officially given to ACCA21.

<sup>184</sup> Interview G4.

<sup>185</sup> Interview G2. Another good proof that the ACCA21 staff was inexperienced in the beginning is to be found in an internal UNDP memo from September 1994. It states that “[a]ccording to ACCA21 this project does not necessarily need a feasibility study. Implementation could start relatively soon”.

<sup>186</sup> Interview G2.

ACCA21 is supposed to serve as a bridge between domestic and international partners – and between domestic partners as well – for the implementation of the priority programmes. However, due to its short history, its national and international linkages are far more limited than those of both SDPC and SEPA. It should be noted, however, that MOST has an extensive network of science and technology representatives on Chinese embassies around the globe (see below). ACCA21 itself pursues an active internet strategy to draw the attention of international business as well as foreign governments and researchers. Its leaders have participated actively in CSD activities, and it has sent numerous delegates to a number of international fora and countries in the North to secure funding to the Priority Programmes.

The establishment of Centre for Environmentally Sound Technology Transfer under ACCA21 in 1997 seems to have strengthened ACCA21's position somewhat, especially in terms of national and international linkages. The role of this centre is very much in line with the A21 goals of establishing regional clearinghouses for promoting the accessibility of information on advanced environmental technologies. There are concrete plans to establish two similar centres in southern and northern China, respectively.

The 1998 restructuring strengthened ACCA21 organisationally. The downsizing of MOST resulted in that many previous MOST functions were outsourced to MOST's centres, among them ACCA21 (see Section 8.2.1). As part of the restructuring, ACCA21 was awarded new responsibilities within the areas of R&D, science and technology for disaster mitigation, and life sciences (a new medical department has been established). More functions are likely to follow in the time to come, one of them is the management of the R&D programme for a large Sustainable Development Communities project, lead by MOST and SDPC. The Director General of ACCA21 is since 1998 directly appointed by MOST, which also indicates that MOST places increased emphasis on ACCA21.<sup>187</sup>

At the time when China's Agenda 21 was launched, SSTC held a strong position in the Chinese political system, the environmental sector being no exception. The State Environmental Protection Commission (SEPC) was established in 1986. Here, ministers from all relevant ministries came together four times a year to improve interdepartmental co-operation in environmental questions. SEPC work was prepared, organised and led by SSTC,

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<sup>187</sup> The State Commission for Restructuring the Economy was part of the Leading Group for the Sustainable Communities Project until it was reduced from a commission to an office in the 1998 restructuring process.

with NEPA acting as secretariat. SSTC took many environmental diplomacy decisions, and represented China internationally, e.g. at the Earth Summit in 1992. In this period, SSTC seems to have had ambitions to control the environmental sector in China, including NEPA, and therefore objected to the plans for a separate ministry for environment. SSTC also took formal CA21 leadership, and have gained control over ACCA21 by funding most of its activities and providing most of its staff.<sup>188</sup>

As a result of the 1998 restructuring, MOST took over from the former State Planning Commission the responsibility of drafting national medium- and long-term plans for national scientific and technological development.<sup>189</sup> Among the responsibilities transferred from MOST to other bureaucracies was the authority over the State Bureau of Oceanography (now called the State Oceanic Administration, see below), transferred to the Ministry of Land and Resources (MLR). Its Rural and Social Development Department (headed by Vice-Minister Deng Nan, the daughter of Deng Xiaoping) co-ordinates MOST's CA21 work. It is responsible for science and technology projects associated with population, resources, environment, health and medicine, among them the experimental zones for sustainable development.<sup>190</sup>

After the 1998 government restructuring, MOST has a staff of about 230. Its main responsibility is to craft China's strategy for promoting economic and social development by relying on science and technology. MOST is also very influential in the area of research and development. One of its areas of responsibility is to co-ordinate the science and technology work of State Council departments, various provinces, autonomous regions and municipalities, including the ongoing reform of the science and technology system. Thus, it allocates much of the funding for research in China, including environmental research. For example, all funding for SEPA's research is allocated by MOST. The ministry also has a central role in stimulating foreign and domestic investment in science and technology, of which CA21 is an example. Furthermore, MOST has the responsibility for a number of large technology development and assimilation projects, even though much of this work has now been delegated to research institutions and local governments.

MOST has a strong international profile. Its International Co-operation Department is responsible for foreign co-operation and exchange in science and technology, manages foreign

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<sup>188</sup> Interview PGA4 and PGA5.

<sup>189</sup> Department of International Co-operation, State Information Centre (2000b), "Ministry of Science and Technology", URL: <http://www.cei.gov.cn/sicnet/siccew/ech/a1/ca102mst.htm> (20 January 2001).

science and technology aid, and directs the work of science and technology organisations as well as scientific and technical officials abroad. The department is also responsible for maintaining relations with science and technology organisations of foreign governments and international organisations posted in China

*The State Development Planning Commission* (SDPC) lost some of its core functions during the 1998 restructuring, mainly due to the gradual introduction of a market economy in China.<sup>191</sup> It still exercises considerable influence over which projects are implemented in different sectors in China. However, after the restructuring in 1998, it evaluates projects not in terms of their economic viability but their accordance with political development goals.<sup>192</sup>

Furthermore, while SDPC will still develop strategies and annual, medium and long-range plans for China's economic and social development, the State Economic and Trade Commission (SETC) has taken over the responsibility for formulating and implementing industrial policies. MOFTEC has been granted the responsibility for formulating policies on foreign trade, economic co-operation and foreign investment, as well as the administration of those import and export quotas that have not been left to the market.

The formulation of plans and financing affairs for major technical projects has been diverted to MOST. Plans for the utilisation of land and resources are now the domain of the Ministry of Land Resources; however, SDPC is still to participate in overall planning of water resources, and is central in regional and sustainable development policy.

SDPC's role in economic planning has been toned down somewhat. Its authority to fix prices and control loans for specific projects has been considerably reduced. Rather than to specify production targets for industry and transportation, as it did before, it is now to provide forecast targets.

Apart from economic and development planning, SDPC is now responsible for formulating policies for taxation, interest rates, exchange rates and the prices of certain commodities. It also monitors China's foreign debt and export balance, sets the total size of fixed asset investment,

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<sup>190</sup> Ibid.

<sup>191</sup> Interview N7.

<sup>192</sup> Interview B15. Apart from interviews and other documentation, the information used in the discussion on SDPC's relative organisational strength is based on Department of International Co-operation, State Information Centre (2000d), "State Development Planning Commission", URL: <http://ce.cei.gov.cn/echm/a1/ca102dpc.htm> (20 January 2001).

including the management of state grain reserves, and conducts planning related to major projects. SDPC is also engaged in the development of high-tech and knowledge-intensive industries.

In drafting China's Tenth Five-Year Plan (2001-2005), SDPC has allowed a greater role for market mechanisms. The main objectives of the plan are to harmonise economic development with population growth, natural resource exploitation and environmental protection; and to level out regional imbalances by developing central and western China.

SDPC has a staff of 590, in 19 functional departments.

The *Ministry of Foreign Trade and Economic Co-operation* (MOFTEC) replaced the Ministry of Foreign Economic Relations and Trade (MOFERT) in March 1993.<sup>193</sup> After the 1998 government reshuffling, the Ministry of Foreign Trade and Economic Co-operation (MOFTEC) is now responsible for policy-making related to – and management of – foreign investment and trade in China. MOFTEC is also responsible for negotiating with foreign governments or international economic and trade organisations (including the WTO negotiations), and representing China in such organisations. Furthermore, MOFTEC devises import and export development strategies; promotes and manages foreign investment in China and China's investment abroad (including aid); and considers applications from foreign-funded enterprises for doing business in China as well as applications from Chinese firms to engage in activities abroad. MOFTEC also participates in the formulation of taxation, exchange rates, credit and pricing, and maintains contacts with commercial organisations of foreign embassies in China.

Before the restructuring, MOFTEC was responsible for all projects involving foreign financing, including mixed credits projects. After the 1998 restructuring, the Foreign Financing Administration was placed under the Ministry of Finance (so was the responsibility for mixed credits projects, and the task of negotiating and signing international agreements related to external finance and foreign borrowing). The management of foreign governmental loans was transferred to the Ministry of Finance and the China Import and Export Bank. This meant that

MOFTEC's project portfolio – and thus its chances of skimming fees and profits from lucrative international projects – was considerably reduced.<sup>194</sup> This also implied a loss of prestige, according to MOFTEC sources.<sup>195</sup> After the restructuring, the MOFTEC bureaucracy is to become more clearly separated from the enterprises run by units directly affiliated to it. A number of approval procedures have been delegated to relevant chambers of commerce, and a number of planning routines (like issuing general import and export plans) have been discontinued. However, as mentioned above, the formulation of policies for foreign trade, economic co-operation and foreign investment and the management of general import and export targets and quotas were diverted from the former SPC to MOFTEC.

MOFTEC has a staff of 457 people in 19 departments, of which a majority has an international profile. Among these are separate departments for Asian, West Asian and African, European and American, and Oceanian Affairs, as well as for overseas economic co-operation, and international trade and economic co-operation. MOFTEC therefore has a comprehensive international network.

Many studies have documented the inferior bureaucratic status of the *State Environmental Protection Administration* (SEPA) compared to the planning, economic, construction and industrial authorities (Ross 1988, Edmonds 1994: 255-256, Sinkule and Ortolano 1995, Jahiel 1997, 1998). However, the environmental bureaucracy has been relatively strengthened since the launching of China's Agenda 21, compared to the CA21 administration.

In the 1998 restructuring, SEPA (together with the custom authorities) was the only agency promoted to ministerial status. SEPA is now a ministerial-level authority directly under the State Council responsible for environmental protection. This was remarkable, as the whole point of the restructuring was to *reduce* the number of ministries considerably. It has also been signalled that there exists a clear plan to increase SEPA's standing further from its current "deputy-ministerial" to full-fledged ministerial status when the central government's resource situation is improved (Lo and Leung 2000: 678).

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<sup>193</sup> Apart from interviews and other documentation, the paragraph on MOFTEC's relative organisational strength is based on ChinaUnique (2000), "Ministry of Foreign Trade and Economic Co-operation", URL: <http://www.chinaunique.com/moftec.htm>; Department of International Co-operation, State Information Centre (2000f), "Ministry of Foreign Trade and Economic Co-operation", URL: <http://ce.cei.gov.cn/ech/a1/ca102fte.htm>; Ministry of Finance (2000), "Role of the Ministry of Finance", URL: <http://mof.gov.cn/eng/index2-role.htm>; Department of International Co-operation, State Information Centre (2000g), "Ministry of Finance", URL: <http://ce.cei.gov.cn/ech/a1/ca102mfe.htm> (all 20 January 2001).

<sup>194</sup> As the Ministry of Finance (MOF) took over the Foreign Financing Administration only after the Sino-Norwegian co-operation had been discontinued, MOF is not focused upon in this overview of relative organisational strength.

<sup>195</sup> Interview G4 (MOFTEC source).

As SEPA has recently been granted ministerial position, and as it is only a deputy ministry, its status is still somewhat lower than other ministries. It is entitled neither to approve concrete projects nor to allocate money. It does not generate enough sources of income of its own, nor is it included in the “Ministerial A-Team” of 29 ministries using the name of ministry and having a permanent seat in the State Council.

Since 1998, SEPA has *inter alia* been responsible for formulating and enforcing guidelines, standards, policies, laws and regulations for environmental protection at large. This also includes pollution control, and environmental impact assessments of development plans and technological policies. Guiding, co-ordinating and monitoring marine environment protection work is also among SEPA’s specified tasks (this is to be the role of the Ocean and Sea Division in the Department of Nature Conservation). So is the co-ordination of efforts to deal with major environmental problems involving different departments, localities, river basins and regions; and resolving interprovincial environmental disputes. SEPA is also supposed to organise, build and manage the national networks for environmental monitoring and environmental information, and submit reports on the national environment quality. In addition, it shall co-ordinate publicity and education on environmental protection, and encourage public and non-governmental organisations to participate in environmental protection.

The environmental bureaucracy has also started promoting technological solutions to environmental problems (including cleaner production technologies and development of clean energy) rather than purely administrative measures. Although the responsibility for formulating environment protection industrial policies was transferred to the State Economic and Trade Commission, SEPA still promotes the development of environmental science and technology and important research projects, and guides the development of the environmental industry. It has also gradually introduced more market incentives and economic instruments to encourage environmentally friendly behaviour and technologies. In addition, SEPA works to attract foreign investment to China’s environmental protection efforts. Finally, SEPA has taken over the responsibility for the administration of nuclear safety from the former State Science and Technology Commission.

The 1998 reform intended to make SEPA more powerful in macro-level policy, through abolishing the State Environmental Protection Commission and transferring its mandate to SEPA (See e.g. Jahiel 1998, Guo N. 1998). Each department is now supposed to approach SEPA with project proposals and guidelines for review before they are handed over to the State Council for final approval. Whether this actually happens, remains to be seen. For example, SEPA now has a higher bureaucratic rank than the former industrial ministries,<sup>196</sup> but SETC can always block SEPA's initiatives, as it is a commission, and thus has higher rank than SEPA.<sup>197</sup>

As was the case with all central bureaucracies, SEPA's staff was substantially reduced in the 1998 restructuring. Admittedly, SEPA experienced a smaller loss of personnel than did most other ministries (a reduction of somewhere between 30% and 38% has been mentioned in interviews).<sup>198</sup> Nevertheless, this is almost outweighed by the fact that it now has to tackle more responsibilities with a smaller staff than before (a little more than 200, as compared to almost 400 before the restructuring).<sup>199</sup> This suggests that SEPA will still neither have resources nor revenues to leverage the traditional industry bureaux or to exercise stronger authority over provincial and local EPBs.<sup>200</sup> However, SEPA can lean on a host of affiliated organisations, including its own research institutions, monitoring centres, environmental media, government-organised non-governmental organisations (GONGOs), training centres and schools, and industrial associations.

SEPA has gradually become more involved in global environmental issues. After the 1998 restructuring it was entrusted with the responsibility for co-ordinating activities for the domestic implementation of international environmental agreements. It participates in – and co-ordinates – international environmental protection activities, attends international negotiations on environmental matters, and co-ordinates foreign economic co-operation within environmental protection. It maintains a broad range of contacts with international environment protection organisations, and undertakes routine affairs related to China's participation in the China Council for International Co-operation on Environment and Development (CCICED).<sup>201</sup>

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<sup>196</sup> State Bureaux for Coal, Machine-Building, Metallurgical, Textile, Petrochemical and Light Industries, respectively, as well as the government functions of China Petroleum and Natural Gas Corp. and China Petroleum and Chemical Industry Corp.

<sup>197</sup> Interview B15.

<sup>198</sup> Interview G4.

<sup>199</sup> Interview G5 and B15.

<sup>200</sup> Interview B15.

<sup>201</sup> Apart from interviews and other documentation, the paragraph on SEPA's relative organisational strength is based on Department of International Co-operation, State Information Centre (2000h), "State Administration for Environmental Protection", URL: <http://ce.cei.gov.cn/chn/a1/ca102sep.htm> (20 January 2001).

As mentioned above, the bureaucratic borderlines in the marine oil pollution area are subject to continuous debate and reshuffling, with MOC, SEPA and SOA as the main actors. Therefore, the relative strength of these three actors is crucial in order to assess the likeliness of successful implementation of the Yantai project. *The Ministry of Communications* (MOC) was established in 1949. Since the 1998 restructuring, MOC has been responsible for crafting strategies, policies, laws, regulations and technical standards for the development of China's highway and water transport.<sup>202</sup> It is also responsible for the restructuring of the communications industry, and formulating science and technology development policies in the field of communications. This also implies the responsibility for carrying out major road and waterway projects.

Furthermore, MOC's International Co-operation Department is responsible for the foreign affairs of the communications industry, including matters relating to international organisations and Sino-foreign economic and technical co-operation.

Most relevant for this thesis is MOC's responsibility for pollution by vessels; for ensuring the safety of water transport; inspecting vessels and marine transport facilities; rescue and salvage efforts; and the use of ports and navigation facilities.

In 1998, the MOC created the China Maritime Safety Administration out of a merger of its safety supervision and shipping inspection bureaux. The agency is responsible for marine safety and the prevention of offshore pollution resulting from shipping activity (e.g. oil spills), and has implied a centralisation of the marine safety organisational structure (see Section 5.2).<sup>203</sup>

No major functions were transferred to – or diverted from – MOC in the 1998 restructuring. However, a number of its functions changed; after 1998, MOC only examines and appraises *large* communications projects, and the division of responsibilities between MOC's administration and the commercial activities of its subsidiaries was emphasised. MOC has a staff of 300.

Before 1993, *the State Oceanic Administration* (SOA) was positioned directly under the State

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<sup>202</sup> However, the day-to-day responsibility for road transport has been delegated to provincial and local level governments.

<sup>203</sup> "Ministry of Communications – Ministry Profile", *ChinaOnline*, URL: [http://www.chinaonline.com/refer/ministry\\_profiles/MOC.asp](http://www.chinaonline.com/refer/ministry_profiles/MOC.asp) (20 January 2001).

Council. Then it became subordinated to the State Science and Technology Commission. After the 1998 restructuring, SOA became a subdivision of the Ministry of Land and Natural Resources (MLR).<sup>204</sup> Due to the scope of this thesis, we need to make the presentation of MLR short. It was established in 1998, on the basis of the Ministry of Geology and Mineral Resources, State Bureau of Land Administration, State Bureau of Surveying and Mapping, and the National Bureau of Oceanography. SOA by and large replaced the latter. MLR is responsible for the planning, management, protection and rational utilisation of land, mineral and ocean resources.

The State Oceanic Administration is now in charge of “supervising and managing use of sea areas, protecting marine environment, safeguarding marine rights and interests and organising marine scientific studies”. Among its main functions is to “formulate plans, standards and criteria for protection and rectification of marine environment, limit the amount of pollutants discharged into the sea, (...) and prevent sea pollution caused by offshore oil exploration”, and marine monitoring and warning for disasters, to be conducted by SOA’s Department of Marine Environmental Protection. SOA has a staff of about 100 (The MLR has a total staff of 300, including SOA).

As SEPA has lacked administrative capacity, facilities and equipment to fulfil its leading role in the Marine Environmental Protection Law (MEPL), SOA, which has a large number of trained specialists in the field of marine pollution, has sought to increase its influence. In 1998, it was decided to revise the MEPL to make the division of labour between the bureaucracies clearer (Zou 1999: 216-217). SOA remained a national bureau after the restructuring (despite its somewhat confusing title, indicating it was upgraded to an administration).<sup>205</sup> However, the amended Marine Environmental Protection Law adopted by the National People’s Congress in late December 1999 and put into force in April 2000 expands the mandate of SOA. It specifies that SOA is responsible for investigating, monitoring, and assessing China’s marine

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<sup>204</sup> The presentation of SOA is adapted from the following sources: Department of International Co-operation, State Information Centre (2000c), “State Oceanographic Bureau”, URL: <http://ce.cei.gov.cn/echn/a1/ca102sob.htm>; MLR (2000b), “The State Oceanic Administration”, URL: <http://www.mlr.gov.cn/english/Mainsoa%20Web.htm>; MLR (2000c), “Archive of Major Events of MLR”, URL: <http://www.mlr.gov.cn/english/Chronology%20of%20Major%20Events%20for.html>; and MLR (2000d), “Survey of China’s Marine Resources”, URL: <http://www.mlr.gov.cn/english/pMarine%20Res.html> (all 20 January 2001). Apart from the already mentioned MLR sources, the presentation of MLR is also based on: MLR (2000e), “Reform Plan of MLR”, URL: <http://www.mlr.gov.cn/english/3d.html>; and MLR (2000f), “Introduction to MLR Leaders”, URL: <http://www.mlr.gov.cn/english/leaderintro.html> (both 20 January 2001).

<sup>205</sup> MLR (2000c), “Archive of Major Events of MLR”, see above.

environment, for research on such matters, and for environmental damage resulting from near-shore construction projects.<sup>206</sup>

However, marine environmental monitoring does not seem to be on top of the MLR agenda. The words “marine”, “environment” and “monitor” were neither present in the minister’s speech at the 50 year anniversary for the People’s Republic, nor in the summary of main work areas in 2000, or in the summary on MLR’s web site of major events since it was established in 1998. The persons dominating the top leadership of MLR have their education within and have experience from geology and mineral resources, and – to a lesser extent – land administration; only one vice-minister is representing marine interests.

SOA has 16 local oceanic administrations, of which nine are on the provincial level. There are regional SOA branches for each sea region (the South China Sea, the East China Sea and the North China Sea), in addition to a number of R&D institutes. SOA’s International Co-operation Department organises foreign co-operation and exchanges. It also is active in China’s efforts to implement international maritime treaties.

SOA has a separate Department of Maritime Environment Protection (which again has a Division of Pollution Control), whose function is to monitor China’s marine environment, especially the damages caused by offshore oil exploration, waste dumping in the ocean and marine engineering.

Based on the above documentation, the following conclusions can be drawn as to the development in the relative strength of relevant actors within i) the CA21 administration and ii) the issue area of marine oil pollution, since the introduction of CA21 in 1992:

- While its rank is lower than the main competitors’, the CA21 administration has been strengthened in absolute terms regarding jurisdiction and personnel as well as international linkages; however, the rank and jurisdiction of its organisational “host” nationally, the science and technology bureaucracy, has been weakened in absolute terms. Nevertheless, it is still strong in relative terms as regards national and (especially) international linkages, personnel and jurisdiction.

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<sup>206</sup> See “NPC Amends Marine Environmental Protection Law”, *CCICED Newsletter*, Vol. 5 No. 4 – January 2000, p.7, and “Annual NPC session passes laws, closes”, *China Daily*, 27 December 1999, URL: <http://www.chinadaily.com.cn/cndydb/1999/12/d1-3npc.c27.html> (10 November 2000).

- The planning bureaucracy has been substantially weakened in absolute terms regarding jurisdiction after the 1998 restructuring, but still has considerable strength relative to its organisational opponents regarding CA21 administration (SEPA, MOST/ACCA21, MOFTEC) in terms of both jurisdiction, rank, international and (especially) national linkages, and personnel.
- The foreign economic co-operation bureaucracy has been substantially weakened in absolute terms regarding jurisdiction as a consequence of the 1998 restructuring, but is still strong relative to ACCA21/MOST, SEPA and to some extent SDPC regarding jurisdiction, personnel and national and (especially) international linkages.
- The environmental protection bureaucracy has been strengthened in relative terms regarding jurisdiction, personnel, rank, as well as national/international linkages; however, while this has had implications for its relationship to the CA21 administration, it has only had minor impact within the issue area, as it is still inferior to both SOA and – particularly – MOC.
- The communications bureaucracy has been remained relatively stable in absolute terms regarding personnel, rank as well as national/international linkages, while it has been weakened somewhat in terms of jurisdiction. However, within the issue area, it still seems significantly stronger organisationally along all parameters in relative terms than its opponents SEPA and SOA.
- The jurisdiction, personnel and international linkages and the bureaucratic rank of the oceanic administration have by and large remained stable in the period in absolute terms, while its national linkages have been strengthened through its inclusion in the Ministry of Land and Resources. Its relative position in the field of marine oil pollution is weaker than that of MOC, but stronger than that of SEPA.

#### **5.4 Summary and conclusion**

The implementation process of the Yantai project has been horizontally fragmented. However, rather than that too many actors are involved, the problem seems to be that important actors (the bureaucracies for planning, foreign financing, and environmental protection, respectively) have been *excluded* from the implementation process. The division of responsibilities between different bureaucracies involved in or related to the Yantai project (the communications bureaucracy, the environmental bureaucracy, and the oceanic administration) is unclear, the

jurisdictions of these organisations overlapping, and – consequently – the level of interministerial conflict is rather high. Attempts for interministerial co-ordination have so far had limited impact.

The Ministry of Communications (MOC) and its subsidiary, the Yantai Maritime Safety Superintendent Bureau (YMSSB), have co-ordinated their efforts reasonably well. Furthermore, MOC has centralised its control over local marine safety administrations. Nevertheless, YMSSB's influence on the implementation of the Yantai project has been substantial, as it won the struggle for becoming the project site; pushed financing upwards to MOC centrally; and managed to direct the project from a broad technology and capacity building approach towards hardware. The lack of a distinct CA21 bureaucracy on lower administrative levels has made it impossible for the CA21 administration to influence the implementation of the Yantai project even if it would have wanted to.

The relative strength of the environmental protection bureaucracy has improved both compared to the CA21 administration and the opponents within the area of marine oil pollution in the period covered by the thesis (1992-99). However, established actors (MOST/ACCA21, MOFTEC and SDPC related to the CA21 administration, and MOC and SOA related to marine oil pollution) are still stronger in relative terms, both regarding personnel, jurisdiction, and (inter-)national linkages. This is true even though all SEPA's opponents as regards the CA21 administration have been organisationally weakened in absolute terms. The CA21 administration has been somewhat weakened by the degrading of the State Science and Technology *Commission* to the *Ministry* of Science and Technology. The communications bureaucracy, on the other hand, is substantially stronger than its opponents in the area of marine oil pollution, and its relative position has not been weakened to any great extent throughout the period.

In the next chapter, the relationship between these findings and the values documented on the dependent variable (implementation effectiveness) will be analysed, in light of the insights from the analytical framework.

“The most important problem in technology co-operation between China and other countries through China’s Agenda 21 is not technological. It is bureaucratic and institutional. How can we make organisations to co-operate – especially when they have never co-operated before? How can we help companies identify the ‘correct’ partners?”

*Anonymous, World Bank*<sup>207</sup>

## **6 Empirical analysis I: Domestic organisational challenges facing the implementation of environmental technology policy in China**<sup>208</sup>

Below, the relationship between the implementation status of the Yantai project and the three organisational framework conditions is analysed, and related to the values on these variables suggested in Ch. 2. To what extent do the suggested organisational framework conditions explain the sub-optimal implementation status of the Yantai project so far?<sup>209</sup>

The first empirical chapter (Ch. 4), focusing on the dependent variable, characterised the implementation status of China’s Agenda 21 Project 6-8 as sub-optimal according to the criterion of implementation effectiveness. To repeat, implementation effectiveness consists of two components; expected effects and planned outputs. The expected effects of the Yantai project was i) the introduction of technologies and facilities for establishing an emergency demonstration centre in the port of Qingdao, Shandong province, to recover small scale spills and control larger spills (PPCA21 1994), and ii) that the project should be a pilot project, and serve as a model for similar projects in other coastal areas in China. These objectives were to be reached through the following planned outputs: establishing an emergency management administration in the port of Qingdao; establishing an information system for oil spill emergency management; introducing and adopting spill prevention and management technology; and building capacity for prevention and control of oil spills.

The reason why the project was characterised as sub-optimal according to these criteria, was that the project’s focus has narrowed from technology towards technique; that the intended

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<sup>207</sup> Interview PNG4.

<sup>208</sup> Parts of this chapter has been published in Buen (2000a, b).

<sup>209</sup> While this discussion has focused on implementation outcome (as has the other empirical chapters), as signalled in the analytical framework, the inspiration from literature and debates on – as well as interviews about – implementation output regarding the case of study has played a central part as well.

Sino-Norwegian co-operation ended before it had begun, and thus rendered capacity building and technology co-operation impossible; and – to a certain extent – that the technological and geographical focus of the project was changed underway.

Ch. 5, the second empirical chapter, focused on the independent variables. It was documented that the implementation process of the Yantai project has been horizontally and vertically fragmented. However, the documentation of the relative strength of implementing agencies showed a mixed picture; whereas the CA21 administration has been relatively organisationally weaker than its opponents, the transport and communications bureaucracy has been stronger than its opponents in the issue area.

## **6.1 Framework conditions**

### **6.1.1 Horizontal fragmentation: Competing compartments revisited**

The first hypothesis suggested in the analytical framework was that the more horizontally fragmented authority is among the governmental actors involved in the implementation of the Yantai project, the less likely it is that the implementation status of the Yantai project is positive. How and why does horizontal fragmentation of authority influence the implementation effectiveness of the Yantai project?

The empirical documentation in the preceding chapter concluded that the implementation process of the Yantai project has been horizontally fragmented for a number of reasons. First, the planning bureaucracies were not sufficiently integrated in implementation. Second, the environmental bureaucracy was ostracised from the implementation process. Third, the foreign economic co-operation bureaucracy was not integrated in the implementation process either. Fourth, Local Agenda 21 initiatives and CA21 projects were not co-ordinated. Fifth, there was insufficient co-ordination between the CA21 administration and the agencies implementing the CA21 pilot projects. Sixth, the relationship between the agencies most closely involved in the project's issue area (the communications bureaucracy, the environmental bureaucracy, and the oceanic administration) is characterised by vague and overlapping jurisdictions and thus interministerial conflict.

Relatively early in the CA21 implementation process, Lunde *et al.* (1995:57) wrote that “[t]he prime advantage of the Agenda 21 Priority Programme is that it presents fairly concrete projects which are given political priority for implementation”. In hindsight, and much to the surprise of NORAD and the Norwegian businesses involved, it seems that one of the major weaknesses of the priority projects was the *lack* of priority given to them by important actors. This is especially true for those bureaucratic actors whose prestige and economy were not directly influenced by the success of CA21.

The rivalry between SPC and SSTC for the control over China’s Agenda 21 was probably one reason why many of the CA21 priority projects, among them the Yantai project, were not given priority in the 9<sup>th</sup> Five-Year Plan.<sup>210</sup> The State Planning Commission seems to have regarded CA21 as part of SSTC’s portfolio rather than a common undertaking for all central bureaucracies related to environment and development. The 9<sup>th</sup> Five-Year Plan is often referred to as the first one taking environmental problems seriously into account. However, the link between the selection of China’s Agenda 21 priority projects and the selection of key projects in the 9<sup>th</sup> Five-Year Plan has been weak at best. The planners reportedly did not even seem to make an effort to use the priority projects as base for selection of key projects. This was surprising, as CA21 was so fresh in their minds.<sup>211</sup>

Integrating the China’s Agenda 21 projects into the 9<sup>th</sup> Five-Year Plan was crucial; as China’s Agenda 21 covers just about everything, the point of departure was in practice defined by the selection and funding of the priority projects.<sup>212</sup> Therefore, the lack of a clear relationship between the White Paper objectives and many of the projects in the China’s Agenda 21 Priority Programmes has been unfortunate. Some of the chapters in the White Paper have got no projects, others have got many, and some of the projects are at best vaguely related to the chapters in the CA21 White Paper. The Yantai project belongs to the latter category.

The fact that the environmental bureaucracy has been more or less left out of the CA21 process, at the same as this bureaucracy has been strengthened organisationally (see Sections 5.3 and 6.1.3), suggests CA21 will continue to be one of several – and to a certain extent competing – environment and sustainable development programmes in China. Thus, it is highly uncertain whether CA21 will be given priority at the cost of similar initiatives in the

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<sup>210</sup> Interview N7.

<sup>211</sup> *Ibid.*

<sup>212</sup> *Ibid.*

future. Another reason why the exclusion of SEPA from CA21 does not bode well for the implementation effectiveness of the Yantai project, is that this reduces the chances for a co-ordinated approach to marine pollution problems in the Bohai Sea and along the Chinese coastline as such. At least it seems unlikely that such co-ordinated action can take place within the CA21 framework.

MOC might be able to implement projects resembling the one implemented in Yantai in other harbours. However, a comprehensive and co-ordinated follow-up of the pilot project in Yantai, involving other bureaucratic actors like SEPA and SOA, is not very likely. For this to be possible, the actors involved in matters related to marine oil pollution are too many, too uncoordinated, and too enmeshed in institutional rivalry. This harmonises well with Finamore's (1998: 4) analysis of CA21, namely that the heavy focus on demonstration projects is unlikely to be followed up, due to fragmentation.

Lack of co-ordination and institutional rivalry between the CA21 administration and the foreign economic co-operation bureaucracy was probably part of the reason why a number of CA21 priority projects – and the Yantai project in particular – did not get the sufficient priority by MOFTEC. At the time of the Sino-Norwegian negotiations on Project 6-8, MOFTEC's near-monopoly on foreign financing started to come under double pressure – from rivalling initiatives by SSTC and SPC on the national level, and from entrepreneurial local governments (see Section 6.1.2). SDPC, MOST and MOFTEC continue to compete for the revenue and prestige from handling negotiations with foreign vendors and authorities in the sustainable development field. CA21 has been no exception in this regard. SDPC and MOST have sought to handle more projects directly with their foreign counterparts. They seek to handle as much of project preparations as possible through their own channels, linking foreign donors and business representatives to the local partner right away, and only bringing in MOFTEC in the twelfth hour to ensure that the project was included in the official lists of bilateral co-operation projects. This strategy, while potentially in the interest of both the foreign partner and the Chinese implementing agency, can easily backfire.

However, the risk actors like MOST and SDPC have run by following such a strategy is that MOFTEC refuses to put their projects on the list of projects viable for foreign funding, or that MOFTEC finds that their repayment capabilities are not good enough. The last scenario seems to have proved correct for the Yantai project. MOFTEC is widely regarded as a “rubber-stamp

organisation” – an opinion even shared by a MOFTEC interviewee.<sup>213</sup> It felt excluded from the early phases of the China’s Agenda 21 process – especially regarding the preparation of this particular project, because it was not at all well-prepared in MOFTEC’s view.<sup>214</sup> Several interviewees claim that MOFTEC gave the Yantai project and other China’s Agenda 21 projects a lower priority than would have been the case if MOFTEC had been more central in the project process.<sup>215</sup> MOFTEC has the power to give clear signals to the bank to accelerate the approval process; this was probably not done in the Yantai project.<sup>216</sup>

The rivalry between SDPC, MOST and MOFTEC conforms to a larger picture, of an increasing number of cash-strapped central-level agencies launching separate lists of projects for foreign funding. China’s environmental market is – and has been for some time – characterised by overcapacity. Finamore’s (1998: 4) observation that CA21 is a “vehicle for attracting international investments rather than spurring domestic change” therefore might be correct. For example, SEPA’s “Trans-Century Green Plan” requires investments of more than 100 billion yuan (around 12-13 billion USD). If all these projects are carried out, there would be clear water and blue skies in China, but they can be implemented only if they have been officially approved (see section below for more details).<sup>217</sup>

After SSTC won the “bureaucratic battle” for the control of China’s Agenda 21, many other bureaucracies perceived China’s Agenda 21 as belonging to SSTC, and therefore only to a limited extent felt ownership to the programme. To some extent, they regarded CA21 as a strategy on the part of SSTC in the fight for foreign funding (see section below), and subsequently initiated competing and parallel initiatives.<sup>218</sup>

Similarly, priority projects came to be regarded as the “babies” of the implementing agencies, rather than “China’s common property”. While ACCA21 took the role of a facilitator in the introductory phase of the Yantai project, it soon backed out, and the project gradually took the character of a MOC project rather than a project under China’s Agenda 21. This led to less follow-up of the implementation process on the part of ACCA21, and the follow-up that was being done, was not satisfactory, according to Norwegian interviewees. As ACCA21 has been perceived as an agency affiliated to a specific part of government, implementing agencies

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<sup>213</sup> Large parts of this paragraph are based on interview G4.

<sup>214</sup> Interview G10.

<sup>215</sup> Interview PGA4, PGA5, and G3.

<sup>216</sup> Interview G3.

<sup>217</sup> Interview G10.

probably have had little interest in involving ACCA21 in project implementation. This has made co-ordination and information sharing difficult, making it hard for ACCA21 to fulfil its role as a “China’s Agenda 21 clearinghouse”. The job has not been made easier by the fact that the CA21 priority projects are not sufficiently co-ordinated with Local Agenda 21 initiatives. The conflictual relationship between MOC, SEPA and SOA within the area of marine oil pollution has, to my knowledge, not directly influenced the implementation effectiveness of the Yantai project. However, the scope for replicating the Yantai project is reduced, and thus an indirect link to sub-optimal implementation effectiveness is apparent. The picture is not becoming brighter when one knows that most laws and regulations related to the exploitation and conservation of marine resources in China are “sectorial [and] single purpose” in character.<sup>219</sup> A further problem is the fragmented nature of the development of ocean resources (cf. Lu 1990: 376). In addition, it is nearly impossible to draw a line between marine and terrestrial jurisdictions, as there are clear logical interconnections. For example, around eighty percent of marine pollution comes from land-based sources.

The infighting about which bureaucratic actor should control China’s Agenda 21 confirmed the assumptions made in the analytical framework chapter (Ch. 2), that implementation of environmental technology policy in China is fragmented across several ministries, with overlapping responsibilities.<sup>220</sup> The empirical documentation supports the claim made in the analytical framework, in that co-ordination and co-operation between – and even within – agencies and ministries dealing with international environmental technology co-operation are lacking. This is both assumed to be a consequence of overlapping and conflicting jurisdictions, and a reason why such problems persist (see also UNDP 1993, Sinkule 1993, Economy 1994, and Holstius and Ma 1995: 42). The empirical analysis has documented that the problems and lack of interorganisational co-operation mentioned in the literature characterised the implementation of the Yantai project as well.

While the formulation of the CA21 White Paper and the CA21 Priority Programmes was characterised by bargaining and consensus building, the empirical evidence of these phenomena as reflected in the thesis has perhaps been less comprehensive in the case of the Yantai project itself. This might represent a weak spot in the collection of empirical material –

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<sup>218</sup> Interview PGA4 and PGA5.

<sup>219</sup> Ministry of Land and Resources, “Survey of China’s Marine Resources”, URL: <http://www.mlr.gov.cn/english/pMarine%20Res.html> (20 January 2001).

<sup>220</sup> For more thorough analyses of the horizontal and vertical fragmentation of the Chinese environmental decision-making system, see e.g. Lieberthal (1997), and Jahiel (1997, 1998).

namely a lack of interviews with relevant actors in the local government in Yantai city and Shandong province – rather than a deviation from policy implementation in China as characterised by fragmented authoritarianism theory. However, the suggestion made in the analytical framework that the environmental sector would be more prone to such problems than other sectors cannot be fully verified.

More interesting, from a theoretical standpoint, is the conclusion from the empirical documentation of the independent variables that the main problem of fragmentation in this case seems to be that important actors (the bureaucracies for planning, foreign financing, and environmental protection, respectively) have been *excluded* from the implementation process, rather than that too many actors are involved. It must be assumed that, even though the exclusion of relevant actors does not necessarily affect the implementation of one isolated project, the chances of following up such a pilot project in a comprehensive and co-ordinated manner are probably meagre. Another central aspect in this thesis, which has been discussed surprisingly little in the literature, is what I have already termed “the fight for foreign funding”. In this section, we observed this struggle from the point of view of horizontal fragmentation. However, this fierce competition between bureaucracies for the revenue and prestige related to foreign-financed projects is perhaps even more marked between central and local actors (see Section 5.2, and below)

“For foreigners, it is hard to know which policies can be decided upon locally, and which policies have to be approved centrally”.

*Anonymous, ECON Centre of Economic Analysis*<sup>221</sup>

### 6.1.2 Vertical fragmentation: The fight for foreign funding

The more vertically fragmented authority is within the organisations implementing the Yantai project, the less likely it is that the implementation status of the Yantai project is positive. This was the suggested relationship between vertical fragmentation of authority and implementation status forwarded in the analytical framework chapter. How and why does vertical fragmentation influence the implementation effectiveness of CA21 6-8?

In the empirical documentation in Ch. 5.2, it was concluded that there was rivalry between MOC subsidiaries for the Yantai project; that the central-local relationship with regard to project financing was highly negotiated; that the Yantai project has been initiated in a top-down manner, which has impeded the local anchoring of the project; that the CA21 administration lacks an administrative structure on lower administrative levels; and that YMSSB had its own agenda related to project implementation.

The struggle between several different harbours to become the project site of the Yantai project has clearly reduced implementation effectiveness of the project. The reason is that the infighting between MOC's lower-level replicates decreases the likelihood of comprehensive and co-ordinated follow-up of the project, at least in terms of capacity building. It is not very likely that harbours competing for limited central-level funding and a correspondingly small number of projects are eager to engage in joint capacity building projects.

Although one could speculate that the rivalry between different coastal cities for the Yantai project was partly out of commercial motivations, there were no explicit empirical indications of the "local state corporatism" so often described in the literature (see Ch. 2.2.2). However, the assumption that the devolution of economic and financial authority to lower-level actors would strap central level actors of finances and privileges and thus intensify the struggle between the centre and the localities for foreign funding has been confirmed (see below). So has the assumption that central-local co-ordination in policy implementation is unsatisfactory, and that local-level commitment and capacity are crucial to secure successful implementation.

There seems to have been a certain degree of confusion and disagreement between different actors on the Chinese side of the Yantai project as to whether the process to obtain funding should have been pursued more actively at the local level. This confusion is probably due to YMSSB's position as a centrally controlled agency. As YMSSB has been an agency directly under MOC, local actors may have perceived that YMSSB skipped them in the project preparation phase, and therefore vetoed initiatives for local financing later on in the process. It may also be correct, as YMSSB sources claim, that YMSSB never approached local actors for financing; according to some sources, this was not done, because YMSSB regarded financing as the responsibility of MOC in Beijing.<sup>222</sup> However, the confusion related to whether funding

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<sup>221</sup> Interview PNBI5.

<sup>222</sup> Interview G13.

should come from a central or a local actor also reflects that project funding is subject to continuous central-local negotiations. A fundamental reason for this, as touched upon in the analytical framework, is that more economic power has been transferred to local-level actors as a means to accelerate economic reform.

Authority relations between MOC and YMSSB have been under constant negotiation during the project implementation process (see Section 5.2), according to most Norwegian interviewees. This has delayed project negotiations and project preparations for two reasons. First, it made it necessary to spend more time and resources – both for the Chinese and the Norwegians – on internal co-ordination between the end user in Yantai and MOC centrally. Second, it made it difficult for the Norwegians to understand the authority structures among the Chinese actors implementing the project. This indirectly contributed to the Norwegian withdrawal from the project, and thus had a negative impact on implementation effectiveness. Furthermore, this highly negotiated central-local relationship probably was part of the problem when it came to producing the Chinese portion of the project funding, and therefore influenced implementation effectiveness in a negative manner.

However, relatively recent changes in China's financial system may make it easier to resolve funding dilemmas like this. As mentioned in Section 5.3, the division of labour between MOFTEC and the Ministry of Finance (MOF) was adjusted in the 1998 restructuring. Before 1998, foreign funding was channelled via MOFTEC to the localities, while the Ministry of Finance was responsible for getting back the money. Now MOF is responsible for both.<sup>223</sup> MOF – and the banks, e.g. Bank of China – now have every incentive to re-emphasise and strengthen the requirement for clear priorities in the budgets of localities for repayment of loans for buying e.g. foreign technology. Before, when functions were split between MOFTEC and MOF, the guarantees were often not reflected in the real priorities of the local government in question. Thus, provinces and localities gave guarantees, but did not follow them up in practice. The result was that MOF had to reallocate money from other sources to fill in the gap.

This highlights important economic aspects of the project implementation process that have not been sufficiently covered by the analytical framework, namely central-level financial capacity. In discussing environmental technology transfer to China, Martinot *et al.* (1997: 389) cites the “[w]eakening of central political and economic authority” as preventing the adoption of

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<sup>223</sup> Interview G4.

technologies being effective in other countries. The revenue base of the Chinese government totals about 12 percent of China's GDP. In many countries in the North, this proportion may be as high as 40-50 percent (Wang 2000). The area of energy and environment promises revenue and prestige related to international co-operation. MOFTEC and other central government agencies cling to their influence over decisions on government grants for such international co-operation projects.<sup>224</sup>

The problem of “too many mothers-in-law” – e.g. that a local level agency has to report to two or more different superiors, where one is local government and another is functional central unit within the issue area – has not been prominent in the case of YMSSB. This is probably due to the fact that YMSSB, in contrast to e.g. local environmental protection bureaux' relationship to SEPA, is funded and administered directly from MOC in Beijing. The drawback of central co-ordination, as the Yantai project illustrates, is rather the danger for a lack of co-ordination with local and provincial level actors – within e.g. financing and planning. This means trouble in a situation where the central government is so cash-strapped that most foreign environmental co-operation projects in reality depend on local and provincial funding goodwill in order to be implemented.

The Yantai project was formulated on the national level, and the preparatory talks were conducted with MOC, and not YMSSB, or the local government in Yantai. Lack of participation in decision-making processes often weakens commitment on the part of implementers. A difference in interests can perhaps be observed between central and local actors. While central actors to a larger extent seem to view a particular project as part of a more comprehensive and longer-term strategy (if not always co-ordinated with other bureaucratic actors, so at least within their own department), local actors have their own agenda. They seem more interested in short-term economic and material benefits, and enhancement of their status in the locality as well as compared with similar agencies in other areas. This may cause a situation where the distribution of power and responsibilities between central and local levels within a *xitong* (a “system” of vertical authority within a particular policy domain, e.g. environmental policy, or communications policy) is in constant flux, as illustrated in the fight for foreign funding outlined above.

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<sup>224</sup> Interview PGA4.

The implementation effectiveness of the Yantai project has also potentially been reduced because ACCA21 lacks a vertical bureaucracy to rely on in monitoring and co-ordinating the implementation of projects. In the case of the Yantai project, ACCA21 has not been able – or perhaps not willing? – to participate actively in implementation, and has therefore not been able to influence the course of the project other than sporadically through its “clearinghouse” function in Beijing.

The hardware-oriented approach taken by the project’s end user, Yantai Maritime Safety Superintendent Bureau, contributed to the delay and later discontinuation of the Sino-Norwegian co-operation. The main reason for this was that a project focusing purely on equipment was not acceptable for Norwegian bilateral aid authorities. YMSSB’s focus on hardware rather than capacity building obviously has also moved the technological profile of the Yantai project away from the specified output in the PPCA21 1994 project description, and thus reduced the implementation effectiveness of the project.

To summarise, the fight among several different harbours to become the project site of the pilot project on oil spill prevention and control potentially reduces implementation effectiveness because it decreases the likelihood of comprehensive and co-ordinated follow-up of the project, at least in terms of capacity building. The hardware-oriented approach taken by the project’s end user, Yantai Maritime Safety Superintendent Bureau, not only changed the project’s technical profile in the direction of equipment, but also contributed to the delay and later discontinuation of the Sino-Norwegian co-operation. The fact that authority relations between MOC and YMSSB have been under constant renegotiation during the project implementation process, has slowed down project negotiations and project preparations, not the least because it has made it difficult for the Norwegians to understand the authority structures among the Chinese actors implementing the project. Part of the background for the negotiated central-local relationship is that the central bureaucracies are cash-strapped while local actors have obtained increased financial autonomy because of economic reforms.

### 6.1.3 Relative organisational strength

Given that authority is fragmented horizontally and vertically; the weaker the agencies implementing the Yantai project are compared to organisational opponents of the project, the less likely it is that the implementation status of the Yantai project is positive. This was the

suggested relationship between relative organisational strength of implementing agencies and project implementation status in the analytical framework chapter. How and why does the relative organisational strength of the implementing agencies influence the implementation effectiveness of Project 6-8?

As documented in Ch. 5 above, and revisited in the two foregoing sections in this chapter, the implementation process of Project 6-8 in Yantai has so far been characterised by horizontal and vertical fragmentation. Ch.5 also concluded that the Ministry of Communications, the main implementing agency in the Yantai project, has so far been organisationally *stronger* than its main opponents SOA and SEPA along all parameters examined (jurisdiction, personnel, rank, national and international linkages). The implementing agency on an administrative level, ACCA21, had been strengthened in absolute terms on all parameters except rank, but its mother agency, MOST, has been weakened substantially in absolute terms regarding its jurisdiction, due to its degrading from commission to ministry level. SEPA, an opponent both in the issue area and CA21 administration, had been strengthened in absolute terms along all measured dimensions. However, it is still substantially weaker than both ACCA21/MOST and MOC in relative terms.

In terms of jurisdiction, MOFTEC is on the defensive, as other central- and local level bureaucracies have broken its former near-monopoly on the prestige and money related to foreign financing. MOFTEC has also been faced with fierce competition from other ministries and commissions and from territorial actors on lower levels for the benefits related to foreign-funded projects.<sup>225</sup> Its scepticism towards approving the Yantai project therefore may have been one way of signalling who as authority in matters related to international economic co-operation.

The fact that ACCA21 is still organisationally weak in terms of number of – and the competence and experience of – personnel, has contributed to reducing the implementation effectiveness of the Yantai project. The reason is that these limitations have made it more difficult for ACCA21 to monitor the implementation of priority projects like Project 6-8. As ACCA21 has had a rather limited national and international network, also has reduced its value for foreign actors (like NOSCA) entering the Chinese environmental technology market. However, ACCA21 is gradually starting to live up to its role as a clearinghouse for sustainable

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<sup>225</sup> Ibid., and PGA5.

development information and network building, so this situation looks brighter today than it did when project negotiations started in 1994-95. Nevertheless, even if it had had the capacity to monitor the implementation of the priority project, ACCA21 would find it difficult to influence the course of the projects already underway. The reason is that it has a lower bureaucratic rank than most of the bureaucratic actors whose projects it has been supposed to monitor (among them MOC). As mentioned above, the rank of its mother organisation, MOST, has also been reduced.

MOC, on the other hand, has proven to be organisationally stronger than the other organs in its issue area, and most certainly than ACCA21 – both in terms of personnel and international linkages. Perhaps most importantly however, MOC was able to generate financial resources to implement the Yantai project itself after the Sino-Norwegian co-operation ended. MOC also has had a higher rank than its main organisational competitors within the field of marine oil pollution, SOA and SEPA. Furthermore, SEPA and (to a certain degree) SOA have lacked the organisational strength to fulfil their roles in the marine environmental protection sector. For example, SEPA has not been able to conduct environmental monitoring, as it does not have access to the necessary vessels. Therefore, there has been scope for the transport and communications bureaucracy to increase its influence within this sector.

The relative organisational strength of MOC was probably the most important reason why the project was not shelved when the Norwegians withdrew, and has therefore had a very positive influence on the implementation effectiveness of the project. In a more extensive analysis, financial resources should be added among the indicators of organisational strength. It is probably a key indicator; weak and/or newly established bureaucracies probably will also be financially weak, as they will neither have established relations with the bureaucracies controlling the coffers, nor have generated substantial sources of income of their own.

In a situation where the CA21 administration lacks relative organisational strength, and has a limited jurisdiction, there is scope for implementing agencies to redefine projects to suit their own purposes. Horizontal fragmentation is therefore not the only factor explaining how MOC has been able to implement the Yantai project without much interference from the CA21 administration. ACCA21 has (not shockingly) lacked the organisational capacity to monitor and follow up the implementation process of all priority projects, and no other bureaucracies have felt the responsibility, as ACCA21 is the unit having got the assignment.

The environmental bureaucracy has been strengthened organisationally, but has been ostracised from the formulation and implementation process of CA21. Therefore, it has initiated and implemented parallel and to some extent competing and partly overlapping initiatives, like “Blue Sea Bohai”. The fact that SEPA was awarded the responsibility for the co-ordination of environmental policy making and implementation in China after the 1998 restructuring was most definitely a victory for SEPA itself. However, SEPA’s upgrading is not necessarily beneficial for the co-ordination of environmental work in China, given SEPA’s current organisational resources and status. It is hard to see how SEPA can fulfil such a demanding co-ordination task in a convincing way as its standing is today.

Focusing on the relative strength of *environmental and developmental bureaucracies*, as suggested in the analytical framework (Triantafillou 1995), has only partly been relevant. Conventional industrial ministries were among the main actors in the organisational struggle related to CA21 formulation, which was to some extent polarised between environment and development ministries. However, CA21 is a sustainable development programme rather than a programme focusing strictly on environmental matters. For example, while MOC is implementing the project studied in this thesis, it is a developmental rather than an environmental bureaucracy. A seemingly more relevant conflict dimension goes between those Chinese bureaucracies (be they central or local, environmental or developmental) being able to benefit from the trend towards more domestic and international focus on environment and sustainable development, and those who have not been able to or in the position to do so.

## **6.2 Reflections on implementation theory**

As touched upon in section 2.1, taking *one* authoritative decision as an empirical point of departure in this study would have made little sense. The project has been part of a larger programme, in which many different organisations have taken part.

The effectiveness criterion employed in this thesis is closely related to criteria employed in decision-oriented approaches. However, as mentioned in Chs. 3 and 4, measuring the correspondence between goals and local arrangements would not have given a sufficiently nuanced picture, as the deviation from original goals may very well have *positive* implications

on other indicators of successful implementation – perhaps even on other facets of implementation effectiveness.

As documented through the discussion on vertical fragmentation, viewing environmental policy implementation only from the perspective of the centre is insufficient. Lower-level governmental actors are economically powerful, and have their own agenda. Furthermore, as will be documented in the next section, it is insufficient only to concentrate on formal relations of authority, as informal relations across organisational boundaries to a certain extent may affect policy implementation.

## **7 Empirical analysis III: Putting the actors back in**

The empirical work has revealed a number of aspects related to the CA21 implementation process in general and Project 6-8 in particular that are not covered to a satisfactory extent by the variables suggested in the analytical framework. While these should, strictly speaking, be documented in the empirical documentation chapters above, I have chosen to treat them as part of the empirical analysis. The reason is twofold. First, the empirical documentation on these points is so sparse and fragmented that it is not really worth treating as a separate point in the empirical documentation. Second, closely related to the first point, rather than to establish undisputed empirical facts the sections below therefore serve to put forward possible weaknesses of the originally proposed analytical framework and suggest ways to ameliorate these. This naturally belongs in an empirical analysis.

The following empirical fragments and the suggested theoretical implications of hopefully serve to ameliorate a possible weakness of the analysis so far; while there is relatively unambiguous empirical documentation for degree of horizontal and vertical fragmentation as well as degree of relative organisational strength, it might sometimes be difficult to detect the direct links between values on these variables and values on the dependent variable (implementation effectiveness). The most important cause of this weakness, which should become obvious from the empirical points and theoretical elaborations below, is that the thesis'

independent variables are exclusively structure-oriented.<sup>226</sup> While structural variables are well suited for generalisation, they may render it difficult to get to grips with project-specific issues. These may be less fit for generalisation, but may at the same time improve understanding of project implementation dynamics substantially.

### **7.1 The impact of individuals, and the territories of technology**

The first notable characteristic of the implementation of CA21 in general and Project 6-8 in particular that does not entirely fit into the original analytical framework is the importance of individuals and individual relationships for successful implementation. The second point at odds with the original analytical framework is the role technology seems to play in the organisational competition for the resources and prestige related to international environmental technology projects.

*Importance of individuals and individual relationships for successful implementation:* The role that individuals play in implementation seems to be important in at least three ways: First, a small number of distinguished and influential individuals have taken the role of CA21 “aides”. Second, it seems that chances for implementation success are improved if key persons in implementing organisations actively cultivate relations with key individuals in organisations on whose jurisdiction the project encroaches. Third, relation building still to a certain extent seems necessary in order to increase access to information.

First, the concrete implementation process of the Yantai project illustrates the importance of individuals. In the starting phase of the Yantai project, as well as in the period from 1997 onwards, Ms. Wang Shu Mei was head of YMSSB’s “Office for the Model Project of Oil Spill Prevention from Ships”, and thus personified the Yantai project. She met the Norwegian project representatives a number of times in 1995, but then a period followed when Ms. Wang was not in charge for the project locally. In this period, the project lagged behind schedule, and there was a lack of continuity in the relations between YMSSB and the Norwegians. The new head of the project office also reportedly cultivated relations with other vendors in parallel with

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<sup>226</sup> This structuring of the analytical framework might also still be criticised for not taking into account that technology (e.g. through implemented projects) has an independent influence on social and political processes. As technology is not included as an independent variable, the chosen approach could easily be criticised of being social determinist and static, as it does not fully appreciate the two-way dynamism of socio-technological processes. This inherent weakness of the analytical framework could have been avoided by acknowledging a dynamic interdependence between structure and agent. In other words, one would study not only how framework conditions and the strategies resulting from these framework conditions affect the implementation of environmental technology projects, but also how actors’ strategies in turn influence framework conditions, embodied in concrete actions (as for example the Yantai project). However, such a demanding endeavour

the Norwegians – for example, he allegedly directed his attention more towards U.S. equipment suppliers.<sup>227</sup> However, the other central persons in the project in MOC were still working with the project.

Three individuals played a key role in preparing CA21 on the central level. While still Vice-Premier, *Li Peng* became the first Chairman of the State Environmental Protection Commission (SEPC) in 1986. After becoming Premier in 1987, Li led the preparations in China and the co-ordination among developing countries before the Rio Summit in 1992. He also headed the Chinese delegation to Rio, and was active in China's follow-up after Rio.<sup>228</sup> Li stepped down in 1998 after two five-year terms as Premier, and now heads the National People's Congress (NPC), still regarded largely as a rubber-stamp organ.

When Li was promoted to Premier in 1988, *Song Jian* became his successor as SEPC Chairman, and kept that position until SEPC was dissolved in 1998. Song was appointed Minister of the State Science and Technology Commission in 1985, and kept that position until 1998 as well. In 1998, he retired to the position as Vice Chairman of the Chinese People's Political Consultative Conference, often regarded as a rubber-stamp organ. As Song combined the SEPC and SSTC positions, SSTC was central in China's environmental policy-making both domestically and internationally, which was part of the reason why it has played such a central role in the implementation of CA21.

Ms. *Deng Nan* has in many ways has been – and still is – the top-level protégé of ACCA21. When ACCA21 was to be established, SPC, SSTC and NEPA struggled for the leadership of the Leading Group for China's Agenda 21. SSTC and Deng Nan got the position. SSTC's leading position in the CA21 process can partly be ascribed to Ms. Deng Nan. One of the reasons may have been that she was more powerful at that time, because her father, Deng Xiaoping, was still alive. While there is no proof that China's "last emperor" dictated the outcome of the CA21 power struggle, it is no bad guess that he had an opinion on the matter, and that his opinion was heeded.

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can unfortunately not be embarked upon within the limited scope of this thesis; after all, its focus is on how organisational framework conditions influence implementation of technology projects, and not the other way around.

<sup>227</sup> Interview PNB16.

<sup>228</sup> There is some disagreement in the literature as to how active a role Li Peng has played for the environmental cause in China. For example, Economy (1994: 182) cites interviewees that describe how Li would be "bored" and how his eyes would "glaze over" whenever environmental issues came up. Li has a background as Vice-Minister of the then Ministry of Electric Power, and thus has been very enthusiastic towards hydropower development. Li has been identified closely with the Three Gorges hydropower project. However, it has been claimed that Li was more negative towards the project while he worked in the Ministry of Electric Power (which has traditionally been sceptical towards such large-scale projects (personal communication with Gørild Heggelund 2000)).

The key individuals mentioned above provided the China's Agenda 21 process with the necessary backing in order to secure rapid implementation – and therefore their retreat from politics or relative weakening of power has weakened the role of China's Agenda 21 as well. Today, most of the individuals having their personal prestige linked to CA21 are either out of high-level politics or have had their influence reduced as a result of the death of influential “aides”. After Li Peng's period as Premier was over in 1998, Song Jian retired to a position in the People's Consultative Conference, and Deng Nan lost the backing of her powerful father,<sup>229</sup> CA21 – while still being implemented – has had low profile in China's political life. In Chinese media, CA21 has been mentioned only once or twice in English-language Chinese media since late-1997) and towards the outside world.

Part of the reason for CA21 lack of central-level attention the last few years can perhaps also be ascribed to the rise of *Xie Zhenhua*, Minister of Environmental Protection and head of the State Environmental Protection Administration, one of ACCA21's main competitors within the realm of environmental technology projects and programmes. Xie is known as being very capable, and is still young (in his early fifties) compared to many other ministers. Thus, he could easily advance to become a member of the CCP Central Committee, taking SEPA with him from deputy ministerial to fully-fledged ministerial status, and perhaps even be promoted to a more prominent job. Xie is also trusted by Jiang Zemin, a point illustrated by the fact that he was among the few officials joining Jiang on his demanding trips to Japan and the U.S., and has been representing China in the United Nations. This also underlines the point that Xie's position is strong partly because of his and SEPA's relations with the outside world. Premier Zhu Rongji's favourable remarks about the environment after the 1998 restructuring illustrate that Xie's relations to central decision-makers are good. Furthermore, both Zhu and Xie are liberals, in that they are outward-looking and focused on the rule of law. In addition, Zhu Rongji is known to respect meritocracy more than seniority, which also favours Xie.<sup>230</sup>

The second indicator of the importance of individuals in project implementation is the value apparently attached to the relation building between key persons in implementing organisations on the one hand and organisations on whose jurisdiction the project encroaches on the other. For instance, although ACCA21 was supposed to have the role of an independent

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<sup>229</sup> However, Deng Nan – widely regarded as being very competent – survived the 1998 restructuring process, and kept both her responsibility for China's Agenda 21 and her position as a Vice-Minister of MOST.

<sup>230</sup> Interview PHKN1.

clearinghouse for CA21 and other sustainable development projects, the contact between ACCA21 and some of the bureaucracies necessary to co-operative with in order to co-ordinate CA21 has been rather sporadic. Two interviewees from different parts of MOFTEC, for example, state that they have “very little – or no – direct contact with ACCA21”, and “have not been in contact with ACCA21 for more than a year”, respectively.<sup>231</sup> This could suggest that ACCA21 leaders have not been able to build relations with key persons in bureaucracies whose accept is most important for ACCA21 to strengthen its position, for example MOFTEC, SDPC and SEPA.

MOC’s feasibility study (1996:13) maintains that YMSSB, the “local ocean bureau, [the local] environmental protection [bureau] and other relevant departments all have good co-operative relationships with each other”. However, part of the reason why the Chinese were not able to produce domestic funds for the Sino-Norwegian co-operation project was probably YMSSB’s lack of relations with relevant local-level actors. The local end user needs to obtain – and maintain – good relations with and the support of the Chairman of the local CCP; the director of the local bank and the local MOFTEC replicate; the local government personalised by the Mayor and/or Vice-Mayor; key persons in the provincial economic committee; and MOFTEC in Beijing.<sup>232</sup> According to a MOFTEC interviewee,

“[t]he problems arose when it turned out that MOC could not provide the guarantee for the loan from the Norwegian government. Then Yantai had to turn to local businesses, and to local government, with whom they had little or no relations (...) The end user of the Yantai project neglected local banks (who could both appraise the project and be lending institutions), the Provincial Committee of Foreign Trade and Economic Co-operation, the provincial Development Planning Committee, and the Provincial Finance Committee. (...) So the problem was not lack of money, but lack of relations.”<sup>233</sup>

A key reason why financing for the Yantai project did not appear might therefore be that YMSSB, being a unit directly subordinate to MOC in Beijing, had not established good relations with such bureaucracies. According to two well-informed interviewees, when EIBC stated that it would only accept a local government guarantee, YMSSB had to apply to local businesses, local banks and the MOFTEC and SDPC replicates of Shandong Province for credit. These initiatives were unsuccessful.<sup>234</sup> As local authorities had not been included in

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<sup>231</sup> Interview G4 and G10.

<sup>232</sup> Interview PNBI7.

<sup>233</sup> Interview G10.

<sup>234</sup> Ibid., and B14.

project preparations earlier on, they had no particular interest in or incentives for investing in the project.<sup>235</sup>

A central aspect of the funding issue seems to have been the relationship – or perhaps the lack of such – between YMSSB and the local government in Yantai. Since 1988, the city of Yantai has earned a reputation for a proactive and long-term environmental policy. According to SEPA, major pollution sources in or near the city have been closed down, moved outside the centre, or received investment in environmental protection measures. Therefore, in 1999, SEPA gave Yantai environmental model city status.<sup>236</sup> This title is held by only a handful of Chinese cities. Furthermore, as mentioned in Section 4.2, there have been several serious oil pollution accidents near Yantai, and tourism is an important part of the basis for economic growth in the Yantai area. Oil pollution is just as devastating for tourism as a green image is positive for it. Therefore, few cities should be better equipped to – and more interested in – following up an initiative for oil pollution clean-up than Yantai. Still, the project does not seem to have received the necessary local support. While the failure of the Yantai government to provide a guarantee for the loan to the Yantai project may be due to either lack of willingness or lack of ability, or both, the above indicates that the project was not given sufficient priority by the Yantai local government. Of course, as Yantai is a relatively small city, it may not have the necessary resources available for investments such as the Yantai project, other commitments taken into account. However, according to experienced Norwegian interviewees, whether a locality in China can provide a guarantee or not, very often reflects the priority given to the project locally.<sup>237</sup>

The Yantai project therefore exemplifies that in order for a project to be implemented successfully, local stakeholders need to be included in the implementation process at a very early stage, and feel ownership to the project. We have not focused much on local actors other than YMSSB in this thesis; however, the role of the local government in Yantai was touched upon in the empirical documentation. In Section 2.2.2, it was suggested that local authorities would be more co-operative the more visible and unambiguous the environmental problem in question is. It is therefore paradoxical that the local government in Yantai has not been more positively geared towards the project, as the problem it aims to remedy – oil pollution – for a large part is of a local character. Oil pollution is also a highly visible and tangible form of

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<sup>235</sup> Interview G10.

<sup>236</sup> SEPA (1999) “China’s Environmental Protection Model Cities – Yantai City”, URL: <http://www.zhb.gov.cn/english/modelcities/index.htm> (23 November 2000).

pollution, and there have been several major oil spill accidents near Yantai as well as elsewhere along the Chinese coastline. While local governments in China on this administrative level are so far not directly accountable toward their constituencies, it is reasonable to believe that they have an interest in focusing on policies enhancing their popularity.

The local government in Yantai obviously would have an interest in receiving the benefits the project could lead to in terms of employment, infrastructure, and increased environmental security. However, as this project was initiated by MOC, the local government has had every incentive to push costs either to YMSSB, or upwards in the system, to MOC centrally, while enjoying its benefits. However, as most other central bureaucracies, MOC has been cash-strapped during the time since project negotiations started, and did not have the ability to finance the project until after the Sino-Norwegian co-operation had ended.<sup>238</sup> The Yantai project, as has seemingly been the case of many CA21 priority projects, has been subject to the mercy and the level of commitment of provincial and even local level government actors, as only these have the necessary funding for implementation (see analytical framework). However, as these actors were not integrated in the project negotiations and preparations at an early stage, they have not given Project 6-8 (and other priority projects) priority. The consequence has been that the Sino-Norwegian co-operation – and thereby large parts of the capacity building element of the project – was discontinued and that project funding was not possible to obtain until after the Norwegians had backed out.

However, there are indications that YMSSB successfully employed a relation building strategy in order to become the site of Project 6-8 in the first place. Informants disagree about the extent of relation building to obtain CA21 priority projects in general, and the case project in particular. However, a Chinese interviewee who worked for a large international environmental consulting company in China at the time the projects in the 1994 Priority Programme were selected, knowledgeable of both the CA21 process in general and Project 6-8 in particular, said that “[m]any representatives from different local governments cultivated relations with Chinese Agenda 21 officials to get projects to their locality”.<sup>239</sup> He also claimed some projects were “packaged” in order to get funding, and after which the project money was spent on completely different purposes. He exemplified this by the Sichuan EPB, which allegedly sent a list of

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<sup>237</sup> Interview B14.

<sup>238</sup> While focusing on the shortage of funds should also be regarded as part of the negotiation tactics on the Chinese side, MOC’s financial situation was not satisfactory, at least not in the early stage of project negotiations, as it had recently experienced losses in a number of international co-operation projects.

<sup>239</sup> Interview B16.

approximately 30 projects to ACCA21: “One of the applications was for wastewater treatment for a fruit manufacturing plant. They got money for the project, and spent it on a factory making fruit drinks. The real interest of this EPB was to make money, not to improve the environment.”<sup>240</sup>

However, such allegations are countered by ACCA21 sources. They do not deny that many of those having proposed projects for the 1994 Priority Programme visited their office, both for assistance in project formulation and to promote their project, but that “[t]he time from ministries, agencies and localities sent us project proposals to the selection of the priority projects was too short to develop good relationships”. Furthermore, according to ACCA21 interviewees, it should be obvious that if the 128 projects included in the two CA21 Priority Programmes have not been accepted because all their proponents had good relations with ACCA21, as establishing such relations would have required a staff many times as large as ACCA21’s. ACCA21 sources claim priority was given to “local governments [that] demonstrated an ability to implement projects, and had expectations as to what the CA21 would bring”.<sup>241</sup>

Nevertheless, one Norwegian interviewee suggests there were other reasons why Yantai obtained Project 6-8 than the technical arguments presented by YMSSB and MOC (see Section 4.2). “Why should Yantai get the project?”, he rhetorically asks, and continues: “Dalian is even more ideally geographically situated [than Yantai], by the Laotieshan international waterway. The neighbouring city of Qingdao is much larger, and has a much larger part of foreign and transit trade, and thereby more ship traffic. (...) Nanjing, Xiamen and Shanghai would also be more natural project sites than Yantai.”<sup>242</sup>

A third aspect of the importance of individuals and their relationships in implementation is the necessity of personal connections in order to obtain information. Interviewees claim that the extent of corruption in the environmental technology field is exaggerated. However, the following quote from the Chinese agent of one of the Norwegian companies involved in the Yantai project might illustrate how subtle the balance is between relation building (or *guanxi*) and corruption:

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<sup>240</sup> Ibid.

<sup>241</sup> Interview G2.

“Mr. XX from MOC’s PDI was central in getting the project going (...) I don’t like him. Every time you want him to do something, you have to arrange a banquet, especially in a project like this. We have given gifts in relation to the project (a watch, nothing big). Banquets and gifts were quite necessary in a project like Yantai.”<sup>243</sup>

Another agent, not directly involved in the Yantai project, says, “entertain them [the potential project partner], give them gifts, invite them to dinners, [and] invite them to Norway. That is the normal way to do it.” He continues: “With good men who you have relations with, you can always arrange something. If they are not good men, and you don’t have relations with them, you can give them money under the table. (...) A deal under the table is possible even if the project is out for bidding. The customer then decides what he wants, but fakes through the bidding.”<sup>244</sup>

Although interviewees do not consider downright corruption as being common (at least not in relatively small projects like this one), the cultivation of personal contacts is deemed very important. Its primary function is to access information about the progress of ongoing projects, and possible new projects in the pipeline. Both before, during and after project negotiations the Chinese play the information card very strategically. Information may be leaked on purpose, in order to play competing groups – be they different bidders for a project, or different actors behind one bid, as the consultants and equipment vendors in the Yantai project – up against each other to force through an advantageous deal.<sup>245</sup> According to one Norwegian interviewee,

“[i]nformation is kept secret – either because it *is* secret, or because it is said to be. In the growing socialist market economy, it is to an increasing extent possible to buy information, but there is still a considerable amount of information to which the only route is personal relations”<sup>246</sup>

MOC’s Planning and Design Institute (PDI) is responsible for the technical aspects of the project on the Chinese side, and is therefore very important in the project implementation process. It helps the end user to select the best products, and can therefore influence the end

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<sup>242</sup> Interview B14. An additional argument in support of this view would be that Dalian has experienced more severe marine oil pollution problems than Yantai. Xu (1998) argues that “[d]ue to the intensive development of industry, as well as the unfavourable hydrodynamic condition[s], marine environment in Bohai Bay, especially Dalian Gulf, stays heavily polluted”, and explicitly mentions Dalian as heavily oil-polluted.

<sup>243</sup> Interview B13. I have chosen to anonymise the MOC employee in question.

<sup>244</sup> Interview B16.

<sup>245</sup> Interview B12.

<sup>246</sup> Interview PNBI5.

user. It is very common for foreign and Chinese companies alike to keep informed about ongoing and future projects through paying fees to design institutes.<sup>247</sup>

*The role of technology in organisational competition for resources and prestige:* As illustrated in Section 5.1 above, the division of responsibilities in the field of marine oil pollution is fragmented. CA21 is a prestigious undertaking. Therefore, in a struggle between two or more bureaucracies for funding, prestige or about bureaucratic borderlines, getting a project description accepted in the China' Agenda 21 Priority Programmes might be a confirmation of territory. As documented above, the Yantai project does not at all fit into the overall objectives of CA21's Ch. 12E, the chapter that the description of the Yantai project in PPCA21 1994 is allegedly based on and thus should be implemented in accordance with. This signals that MOC has been able to define which technology to be given priority in the formulation of priority projects, *after* the formulation of the CA21 White Paper. This had perhaps been more difficult if the CA21 authority structure had been horizontally integrated, and the central-level agencies in which CA21's authority was embodied had been organisationally strengthened. Now, the situation was quite the opposite.

In a policy area with vague and changing "bureaucratic borderlines", bureaucratic borders may be defined by the precedence of projects and programmes implemented, rather than rules and regulations. The Yantai project might therefore have been part of a strategy on the part of MOC to move bureaucratic boundaries in the field of marine oil pollution, or at least to reinforce existing bureaucratic borderlines. Revisions of the project underway made it even more so. While the Yantai project originally was to focus on oil spillage in the *port* of Qingdao, it soon turned out that the focus of the project would be oil spillage *at sea*, in Yantai.

While perhaps partly outside the scope of this thesis, the role of technology in relations between Chinese bureaucracies and business representatives on the one hand and other countries' representatives on the other, is interesting. At the outset, the Norwegians signalled that the capacity building component of the Yantai project was crucial. NOSCA offered a total package including organisational aspects, environmental impact assessment, recommendations on the selection of countermeasures based on risk analyses, and a training and R&D programme. NOSCA's aim was to provide the Chinese with equipment; knowledge about how this equipment should be used; and an organisational framework within which to operate the

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<sup>247</sup> Interview B12 and B13.

equipment efficiently. In the words of one representative, “[e]xperience from Norwegian work in this field is that planning, education and organisation of oil spill contingency is essential. This should not be decoupled from equipment, as capacity building forms the basis for selecting correct countermeasures in an emergency situation. (...) What makes the Norwegian concept unique is the linkage between planning and all the other areas.”

The Norwegian project group wanted to gather more experience before hardware was transferred to the Chinese counterpart. The end user, YMSSB, claimed they had the necessary background to start using the equipment, as they could base their conclusions on an American study as well as the Norwegian prefeasibility study. They said that if they received more concessionary aid, they would buy Norwegian hardware for the money. NORAD replied that a combination of concessionary aid and soft loan would be provided if the studies could continue. The concessionary aid would be used for capacity building and the mixed credit for purchase of technology. This signalled that NORAD was willing to stretch very far to secure that both competence and technology was included in the project. Indeed, according to knowledgeable interviewees, this was the first time NORAD’s Industry and Energy Department and Asia and Latin America Regional Department had co-operated this close on a project basis.<sup>248</sup>

Thus, the difference in the emphasis put on capacity building versus equipment does not seem to have followed national borders; the central bureaucracy of MOC was far more geared towards NOSCA’s (and NORAD’s) ideas on capacity building than YMSSB, which lobbied to channel the foreign funding towards equipment. Norwegian oil spill equipment vendors teamed up with the local authorities in Yantai.

## **7.2 *Relevant actors’ strategies***

In order to ensure a dynamic and holistic understanding of the implementation of environmental technology projects in China, this study should have integrated structure- and more actor-oriented approaches to a much larger extent than what has been done in the analytical framework.<sup>249</sup> The reason for this is that, on the one hand, an exclusively structure-

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<sup>248</sup> Interview PNB11 and G3.

<sup>249</sup> This discussion is central in the so-called agent-structure debate (see e.g. Giddens 1979, 1984, Wendt 1987, Dessler 1989, Carlsnaes 1992, Archer 1995, and Wight 1999). This debate will be returned to in the concluding chapter on theoretical implications (Ch. 8.2).

oriented approach – as reflected in the independent variables – may easily take on an almost deterministic character, and thus cannot incorporate actors’ actions. On the other extreme, exclusively actor-oriented approaches may become too voluntaristic and insensitive to structural impetus. Thus, an analytical framework where influence from structural framework conditions is mediated through the strategies of relevant actors may provide a more useful analytical tool for similar studies in the future.

While framework conditions are defined as necessary conditions for successful implementation to occur, strategies should be regarded as contributing conditions. The reason strategies are analysed here as product of framework conditions. Thus, the argument for the importance of understanding actors’ strategies rests on the assumption that the above hypotheses on the influence of framework conditions are correct. Naturally, while the framework condition variables concentrate both on the CA21 administration and the issue area related to the case project, strategy variables would focus mainly on the issue area, as they are assumed to explain the concrete actions of actors under influence from a set of framework conditions.

The discussion on framework conditions in Ch. 2 was to a large extent based on Jänicke’s (1995, 1997) articles on capacity for environmental policy and management.<sup>250</sup> His distinction between environmental capacity and the utilisation of this capacity is also relevant for our purpose, as he considers the *strategy* of the proponents of a policy or an initiative to be an essential component of capacity utilisation. Jänicke (1997: 6) defines strategy as “the general approach to the problem (...) the purposeful use of instruments, capacities, and situative opportunities to achieve long-term goals”.

Originally, the word “strategy” was used in a military context, and still is very often associated with such – or with game theory, which itself is often concentrating on “high politics”.<sup>251</sup> However, strategy is no longer confined to the military realm. Organisations also have strategies – that is, comprehensive plans for action in order to achieve specific objectives enhancing the organisation’s interest within given framework conditions. In military terms, a distinction is made between strategy and tactics, where the latter is defined as less comprehensive actions undertaken in order to support this strategy. As indicated by the second subtitle in this section (“Tactical translations of technology”), a similar logic is followed – the

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<sup>250</sup> While the discussion on environmental (and technological) capacity is highly relevant for this study, a broader discussion of China’s environmental technology implementation capacity is outside the limits of this thesis (however, this is further discussed in Section 8.2.2).

tactical translation of technology is *part* of a strategy on the part of an organisation to reach its objectives. The main title of the current section (“Relevant actors’ strategies”) is kept in plural form as the strategy of more than one actor is discussed.

Given that the context of environmental technology project implementation in China is characterised by horizontal and vertical fragmentation of authority and the agencies implementing the project are organisationally weaker than their opponents, this might open up for two sets of strategies; individual-cum-organisational relation building, and the tactical translation of technology, respectively.

### 7.2.1 Individual-cum-organisational relation-building

The fragmented authoritarianism model provides a useful conceptual framework within which to understand the degree of vertical and horizontal fragmentation characterising the Chinese policy making system, and the resulting importance of relative organisational strength. It also succeeds fairly well in explaining how fragmentation leads to lack of co-ordination, bureaucratic infighting and, consequently, a need for consensus building between actors on different levels of the political system. However, the theory does *not* explain how this consensus building takes place. Lieberthal (1992: 29) largely accepts the criticism directed towards the fragmented authoritarianism model that it has made little or no use of the insights of cultural approaches to the study of Chinese politics. He admits that such theories may explain “the nature of political alliances, expectations of political behaviour, attitude towards authority relations, and the fundamental strength of political organisations”. Researchers from countries in the North have been surprised by the extent of personalism in Chinese decision making processes portrayed by the Chinese “insiders” (Hamrin and Zhao 1995). This demonstrates the need to enrich the fragmented authoritarianism model by perspectives focusing more on the role of personalism and particularistic ties in Chinese politics.

Giddens (1979: 5, 69) has described this interdependence of agent and structure as “the duality of structure”, in which “the structural properties of social systems are both the medium and the outcome of the practices that constitute those systems”. However, critics have asserted that the notion of duality of agency and structure precludes analysing the empirical interplay between

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<sup>251</sup> The military origins of the word is confirmed by the fact that it stems from the Greek word for “general”. However, the growth of business

action and structure, since the two entities ontologically presuppose each other (Carlsnaes 1992: 258). In order to transcend this artificial dichotomy between agent and structure and analyse the dynamic relationship between the two entities, Wight (1999) suggests a three-level typology of agency. What he calls Agency<sub>1</sub> is described as “freedom of subjectivity”, or a “self” that (in the words of Wendt (1987: 359)) has a theoretical understanding of activities, that can reflexively monitor and potentially adapt its behaviour, and can make decisions. Agency<sub>2</sub> refers to the way in which Agent<sub>1</sub> is born into a structurally ordered social system and thus *involuntarily* acquires certain properties (e.g. black/white, man/woman, poor/rich) affecting the potential of Agency<sub>1</sub> to mobilise social resources. Agent<sub>3</sub> refers to “positioned-practice-places” that agents<sub>1</sub> *choose* to inhabit on behalf of agency<sub>2</sub>.<sup>252</sup>

Let us assume that a person X with his/her unique personality (agency<sub>1</sub>), having been formed by the different agency<sub>2</sub> and agency<sub>3</sub> s/he has experienced so far, is appointed as a leader of the organisation responsible for implementing the Yantai project. When person X takes over the position, it is given a uniquely different content, reflecting X’ agency<sub>1</sub>, agency<sub>2</sub> and other experiences in agency<sub>3</sub>.

It seems that – at least in the case of China – combining agencies<sub>1, 2, 3</sub> to the benefit of an organisation (individual-cum-organisational relation building) is an organisational survival strategy. My argument is that key individuals in China’s bureaucracy, holding what Wight (1999, see above) calls “positioned-practice places” actively cultivate relations with similar individuals in organisations central to the maintenance of their organisation’s interests. The rationale is that, in China’s weakly institutionalised politico-bureaucratic system, relationships between such key individuals in interacting organisations provide the dynamism crucial for inter-organisational relations in a situation of horizontal and vertical fragmentation of authority.

In this way, organisational relations resemble individuals’ relations, in that they are concentric, like circles formed when one throws a stone into a pond (cf. Fei 1992, and Pye 1995b). Thus, my argument is that, in contrast to the characteristics of a Weberian-like bureaucracy, in China an organisation’s relations with other organisations are regarded – both by its members and by outsiders – as ranging from being very close to being peripheral, and are treated as such (see

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and management studies has increased the focus on competitive strategy, that is, means to reach the goals set by a company or enterprise.

Figure 7.1 below). Thus, the use of *guanxi* to “oil the bureaucratic machinery” not only characterises the relationship between *individual and bureaucracy*, but also the relationship between *bureaucrats and bureaucracies* at different levels.<sup>253</sup>

This argument builds on the theory of *informal politics*, defined by Dittmer (1995a: 10, 1995b: 198) as politics where informal relationships constitute ends in themselves. Dittmer (1995a: 29) suggests that economic reforms have weakened the position of ideology in Chinese politics, and thereby increased the room for *guanxi*, as constraints on communication have been relaxed. However, at the same time, utilitarian, market-economic considerations have broken down the dichotomy between value-rational and purpose-rational relationships. Among the results of this development, according to Dittmer, is that the relationship between formal and informal politics becomes “fluid and ambiguous”; the informal is often absorbed by the formal, while the formal has informal aspects.<sup>254</sup> Dittmer also sees the emergence of a new “hybrid *guanxi*”, incorporating elements of purpose- and value-rational relation building, because of this development.

One of the central topics of the scholarly debate on informal politics has been whether informal relationships (or factions) should take the position of independent or dependent variable (or even a combination of the two). Nathan (1973) proposed factions, defined as vertically organised patron-client networks linked by personal connections (*guanxi*), as a central unit of analysis in Chinese politics. He claimed these networks are external to but dependent on the structure along which they exist. Tsou (1976) argued that structure constrains factions. He emphasised that formal structure is the precondition for, not a product of, the development of what he called “informal groups”. Many authors largely regard personal relation building a result of China’s bureaucratic structure (see e.g. Walder 1986, Oi 1989).

In stating that “personal relations are very nearly the sum total of Chinese politics”, Pye (1995b: 39) takes a more extreme standpoint, suggesting that some informal ties have a self-

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<sup>252</sup> Wight’s typology has much in common with Carlsnaes’ (1992: 254) typology of foreign policy action as consisting of intentional, dispositional and structural dimensions, respectively. However, it more explicitly includes a dynamic interrelationship between agent and structure.

<sup>253</sup> The use of agent and agency in this thesis is inspired somewhat by actor-network theory, in that the actor concept is defined to include not only individuals but also organisations. See e.g. Latour’s (1996: 372) suggestion that “[i]nstead of opposing the individual level to the mass, or agency to structure, we simply follow how a given element becomes strategic through the number of connections it commands, and how it loses its importance when losing its connections”. However, the notion held by actor-network theorists that there is no difference between actor and structure because both are networks, is rejected. So is the notion that everything – not only human beings or organisations, but living or dead things – may take the role of an actor.

sufficient function independent of formal structure. The fundament for *guanxi* building, according to Pye (1995b), is a view of the human being as the centre of several concentric circles containing family and social relationships spreading out from the self at the centre. This web of relationships counters the official Weberian rationality of China's bureaucratic system, of specialised functions in a hierarchy based on impersonal authority and formal rules and norms (see also Yang 1959).<sup>255</sup>

As he believes politics and personalism are almost synonymous, Pye (1995a, 1995b) also regards the distinction Dittmer makes between formal legal structures and informal power relationships as irrelevant in a political system characterised by intertwined Party and state hierarchies; secrecy; low degree of institutionalisation; and lack of a legal order.<sup>256</sup> According to Pye, *guanxi* building is a substitute for legal administrative norms and political interest articulation in China. Furthermore, Pye (1981: 77ff) claims that informal network building is a result of a search for security. This search for security, in turn, stems from the fact that conflict between factions collides with the cultural norm of consensus.

Even though Dittmer (1995b: 198) concludes that there exists a scholarly consensus that “informal politics is a consequence of the functional inadequacies of formal politics”, most contributions on informal politics mainly focus on personal relation building as stemming from the (career and personal security) needs of the individual top-level decision-maker. However, Dittmer goes some way in suggesting a “conceptual synthesis” between the individual and the group/organisation as the unit of analysis, giving relationships the central stage. He bases this synthesis on Liang (1974:94, cited in Dittmer 1995: 9), who argues that Chinese culture is neither individualistic (*geren benwei*) nor group-oriented (*shehui benwei*), but rather based on relationships (*guanxi benwei*). This is supported by Tsou (1995: 101-102), who suggests that “the continuum of informal politics” should be joined “to a continuum of formal politics (...) with a middle zone in which the formal and the informal (...) are intertwined, penetrate each other or simply overlap”. By proposing the concept of individual-cum-organisational relation building, which is meant to capture how individual and organisational relations mixed in the policy implementation process in China, I hope to take this debate one step further. The figure

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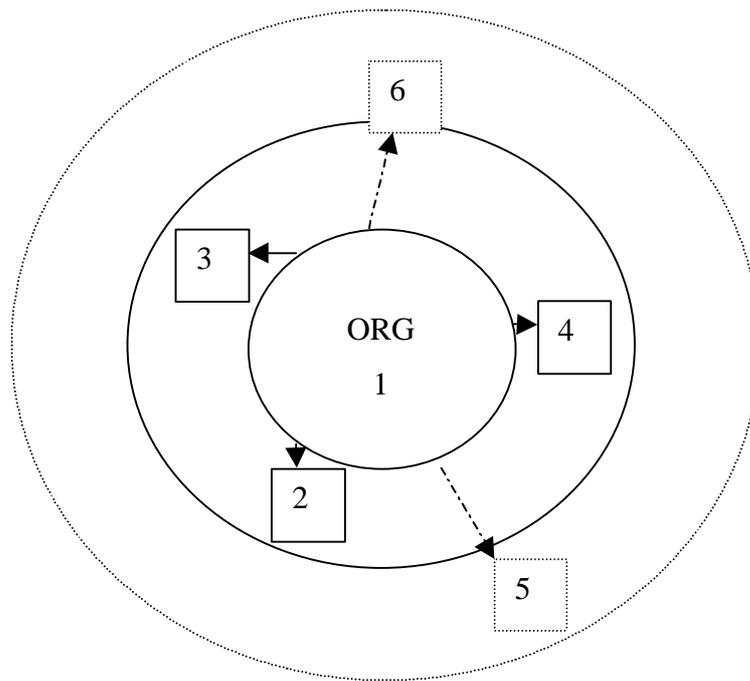
<sup>254</sup> Note that Zhao (1995: 233-234), building on the views of former high-level insiders in Chinese politics, argues the opposite, namely that “personal and institutional authority has become more distinguishable in Deng Xiaoping's China”. Furthermore, Guthrie (1998) argues that economic rationality has started to reduce the influence of *guanxi* in Chinese society. The lack of consensus on this point is further accentuated by the fact that Dittmer (1995b: 202) admits he has reached opposite conclusions on this matter in two different publications.

<sup>255</sup> The reader should observe that Yang's study is empirically delimited to local administration in China in the 19th and early 20th century.

<sup>256</sup> Indeed, this is partly admitted by Dittmer (1995a: 14) when he observed that the distinction between formal and informal politics is “fluid and ambiguous”

below is meant to illustrate how the quality of an organisation's relationships not only is a product of formal organisational setup, but also to some extent resembles concentric circles because it depends on individual-cum-organisational relation building.

**Figure 7.1 Concentric circles – an illustration of individual-organisational relation building**



If an implementing organisation *fails* to nurse its relations with other organisations having a potential stake in the implementation of a particular project, these organisations may often have enough influence over some parts of the implementation process to impede implementation if they wish.

If successful, on the other hand, such individual-cum-organisational relation building might “defragment” decision-making by

- minimising the number of actors;
- minimising the number of decision-making arenas (“concentrates the decision”);
- maximising access to information; and
- reducing time spent on decision-making.

This would be true because it is reasonable to believe that when fewer actors have to reach a consensus, on fewer decision-making arenas, and based on better information, decision-making goes smoother and faster.

In the case of the Yantai project, a reasonable hypothesis would have been that – given horizontal and vertical fragmentation and weak implementing organisations – the less successful implementing agencies were in individual-cum-organisational relation building with strategic partners, the less likely it would be that the implementation status of the Yantai project would be positive.

Carving out indicators actually measuring the extent of individual-cum-organisational relation building will be a challenge. However, the extent of contact between implementing agency and bureaucratic opponents and the importance attached to the role of individuals in the implementing process seem to be two starting points in this regard.

The empirical documentation suggests that research on informal politics would benefit from departing somewhat from the elitist approach followed today (see e.g. Dittmer 1995a, Pye 1995b). Informal relation building seems to take place within and between top layers of lower-level organisations as well. The empirical chapters have also suggested that there might be other motivations for informal relation building than the need for quick decisions, secrecy or discretion – namely to build support for implementation of projects, or at least to ensure that implementation is not “vetoed” by actors more or less closely related to the implementation process.

It is difficult to distinguish the impact of individual-cum-organisational relation building from that of the organisational framework conditions influencing it when the only basis we have is the fragmentary empirical evidence in this thesis. Furthermore, there is not sufficient empirical evidence to assess the relative importance of this variable for the implementation outcome. Neither is there a strong enough empirical fundament to speculate on the impact of economic reforms on *guanxi* building and informal politics at large. However, the claim that the distinction between formal legal structures and informal power relationships is irrelevant (Pye 1995b) seems exaggerated; the character and objectives of such relation building is conditioned by framework conditions.

## 7.2.2 Tactical translations of technology

In a situation where the bureaucratic proponents of a given policy are weak, and the structures of authority in the field are fragmented both by function and territory, room might be opened for manipulation and creative interpretation of the contents of technology and technology transfer. Tactical translations of technology might thus become an integrated part of strategies to win the struggle for power and prestige.

Technical arrangements may (partly) determine the use of technologies, and the way these technologies are used, may enhance the power of some political actors over others (Winner 1986: 25). Akrich (1992) equates the process of familiarising with – interacting with – a new technology with a translation process. However, as is the case with traditional forms of translation, the translator is not only a passive intermediary, but may actively influence communication.

The social construction of technology (SCOT) model (see e.g. Bijker 1995) may offer many insights as regards the manipulation of the contents of transferred technology to serve organisational interests, apart from the fact that it acknowledges the broad understanding of technology on which this thesis is built. First, it aims to explain the *development of a technological artefact* – or *technological change* – rather than interaction between users and readily designed technology (Tjora 1997: 15). In the words of Latour (1987: 258), “[w]e study science *in action* and not ready made science or technology; (...) we either arrive before the facts and machines are blackboxed or we follow the controversies that reopen them.” As the thesis is centred on the implementation process of China’s Agenda 21, this dynamic approach would have been very relevant to integrate in the analytical framework.

Secondly, in the SCOT approach, explanations are found – and tested – through case studies. These concentrate on controversies occurring in development of technologies, involving “different *actors* (individuals or groups that are capable of acting) or *relevant social groups*, which are groups of actors that share a common conceptual framework and common interests” (Brey 1999: 2). These actors or groups try to shape technology according to their own preferences. According to the SCOT model, new technological artefacts have *interpretative flexibility*, inasmuch as different relevant actors understand them in different ways. These

understandings may converge into one through processes of *closure*, and – subsequently – *stabilisation*.

The perspectives of the actors involved in technology development each constitute a *technological frame*. Therefore, a third point, closely linked to the argument above is that the perspectives of different actors – not only in each of the two or more countries involved in an international environmental technology co-operation project but also *within* each of these countries – could be analysed as technological frames. A technological frame can be described as a social structure comprising the elements influencing interactions within relevant social groups and lead to the attribution of meanings to technical artefacts. This structure is at the same time constituted by the actions and interactions of relevant actors, and acting back on these actions and interactions, thus disciplining the actors.<sup>257</sup>

A technological frame *enables* its members by providing tools needed for action: goals, ideas, key problem-solving strategies, current theories, tacit knowledge, testing procedures, design methods and criteria, exemplary artefacts etc. However, simultaneously, a technological frame *constrains* the actions of its members through creating a structure by actions and interactions, which in turn will constrain further thinking, actions and interactions (Bijker 1995: 194-95).<sup>258</sup>

A criterion for successful international environmental technology co-operation projects according to the SCOT model could therefore be that processes of closure and stabilisation have taken place both among actors within each of the socio-technological systems taking part, and – subsequently – between representatives from both systems. As indicated in above, the Yantai project seems to have been a clash between two different technological frames – one directed towards sociotechnical solutions (involving capacity building), the other focusing more on technological fix.

Fourth, by contending that social processes can affect the success of a particular technology, and that the degree of success therefore may vary from one socio-cultural context to another, the SCOT model also seeks to *counter asymmetrical analysis of technological change*.<sup>259</sup>

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<sup>257</sup> This seems to be inspired by the agent-structure debate (see Sections 7.2.2 and 8.2.2, for further elaboration).

<sup>258</sup> The technology historian Thomas Hughes (1987: 86-90) claims technology develops differently in different geographic areas because of differences in *technological style*, formed by differences in geography, historical experiences and political values. However, the influence of politics and power on technological style is absent in Hughes' description.

<sup>259</sup> It should be noted here that there are many facets of social constructivism. *Actor-network theory* (mentioned above) studies stabilisation processes of technical objects as resulting from the building of *networks* of human actors and natural and technical phenomena. It regards technology as developing within actor-networks, whereas SCOT regards society as the context where technology develops (Winner 1991). Actor-network theorists employ a principle of *generalised* symmetry, meaning that *any* element (social, natural, or technical) plays a similar role in explaining in the stabilisation of a technology (see e.g. Brey 1999, Callon and Latour 1992).

Bijker (1995) contends that too many technological success stories are told, and too little effort has been put in to learn from the experience of the less successful technologies. Within this perspective, the fact that the implementation process of the Yantai project has been fraught with problems – while still being implemented – makes it analytically interesting. Just as much can be learned from *unsuccessful* or partly successful attempts to make use of new technology as from technological success stories. To understand technology development and change, Bijker argues, it is not sufficient to treat “successful technology“ as an independent variable in identifying mechanisms behind technological success stories. Technology, says Bijker, should also take role of the dependent variable, and its development should be explained by employing the same variables as are employed in explaining unsuccessful technologies. The SCOT approach does not consider the fact that a technology “works“ as an explanation in itself; rather, the functioning of an artefact is regarded as being a *result* of socio-technological development. Machines work because relevant social groups accept them (Bijker 1995: 270), under certain social conditions.

The fifth reason why the SCOT model seems to be a useful tool for understanding relevant actors' tactical translation of technology, is that it gives room for an actor-oriented approach, as well as structures that empower or constrain relevant actors, in much the same way as the concept of framework conditions outlined above. Proponents of the SCOT model emphasise the need to link micro-level case studies of technological development to the understanding of macro-level socio-political conditions for this development. They have nevertheless been criticised of producing a large number of case studies without being able to generalise from these studies, or, in the words of Winner (1992), “going into the black box and not coming out again”.<sup>260</sup> Because of this, it has been argued that the SCOT approach still is most suitable for analysing particular technology development processes (Olsen 1995: 125). However, attempts for generalisation outside this realm have been made, most prominently by Bijker (1995).

Sixth, the implementation of projects to disseminate environmental technology invented and developed in one social, cultural and organisational context into another, could be regarded as a *re-innovation or re-construction process*. The fact that the SCOT approach so far 1) has largely been employed in – and is *based on case studies from – the North* and 2) has focused on the development of new technologies and/or technological change, rather than aspects related to

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<sup>260</sup> The black box is commonly used in engineering textbooks as a way of simplifying complex technical processes so that further design work can proceed (Winner 1991: note 2, p. 23).

technology co-operation (Leseth 1996) might therefore not constitute a problem. The reason is that international technology co-operation in fact may be regarded as part of technology development, as technology in a sense must be re-innovated (Olsen 1995: 45ff, 125) to be implemented in a new setting. As the focus of this study is on the *implementation, in a country in the South, namely China, of environmental technology co-operation projects based on technology that has already been developed in the North*, it is not self-evident that the SCOT approach is a useful analytical tool. However, since the framework conditions for its use are so different, the technology has to be “developed anew” when transferred to China. Thus, what at the outset seemed to be an argument against employing the SCOT approach could instead be regarded as a means of testing its scope in a new setting.<sup>261</sup>

In her attempt to apply the SCOT model to the study of the transfer of Norwegian environmental technology to China, Leseth (1996) finds that it makes a valuable, but not satisfactory contribution to the understanding of the technology co-operation process. She argues that the theories “show signs of having a Euro-American bias“, and that they therefore “should not be applied to technology transfer projects in China without being adapted to the local context” (Leseth 1996: 55). An interesting possibility, therefore, is to integrate the SCOT model with theories of Chinese views on science and technology, of which an attempt has been made below.

The current Chinese paradigm of technological optimism – or scientism – regards science and technology as core values (Furth 1970, Hua 1995, Bøckman 1998). It is often assumed that there is a single best technological solution – a technological fix – to a problem, and that this solution will work out fine regardless of the context. Tangible technological solutions are less controversial than management or behavioural changes, and may therefore be resorted to in order to avoid conflict.

“Scientistic” thinking has been a central line of thought in the debate as to how China is to be a modernised society (Bøckman 1998). In its most extreme form, scientism is founded on the beliefs that science is unified, that there are no limits to science, and that science is successful in prediction, explanation and control (Hua 1995: 15). It is also characterised by the application of scientific concepts to areas outside their own sphere of relevance (Furth 1970: 14).

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<sup>261</sup> Nevertheless, comparative case studies of different phases of the technology development process can and should be conducted in order to ameliorate the SCOT model’s bias towards the industrialised North (see Ch. 8.2).

Scientism has been influenced by orthodox Marxism and utopianism. However, its roots can be traced in two other directions as well: to Chinese political culture, and to the relationship to and influence from the Soviet Union. In treating all aspects of social relations as an inseparable whole where there is only one legitimate source of truth, scientism bears elements of China's holistic Confucian tradition and its monistic political tradition (Hua 1995: 33,142-143).

Another ideological forerunner for scientism was the movement to strengthen China from its backward position and free it from further attempts for colonisation in the latter part of the 19th century. This movement coincided with the growing influence of social Darwinism. Darwinism provided a justification for the hierarchical social structure in Chinese society, as well as an international framework within which to understand China's position and potential (Furth 1970: 227). Thus, the growth of science and technology was seen as a precondition not to lose out completely in what has been – and partly *is* – perceived as the zero-sum game of international politics.

Hua (1995: 7) identifies technological determinism as a separate strand of scientism, and claims that it has been strengthened in the Post-Mao period. In 1978, when Deng Xiaoping took power in China, the position of science and technology in official Marxist ideology was soon moved from superstructure to economic base. This not only de-politicised the role of science and technology, but also legitimised that the modernisation of science and technology had to take precedence over the three other modernisations initiated by Deng Xiaoping (of agriculture, industry, and national defence, respectively) (Hua 1995: 1).

The large number of technocrats in the Chinese bureaucracy has also prepared the ground for an emphasis on technological fix.<sup>262</sup> The Chinese leadership has also been – and is – influenced by the former Soviet technocratic model of development, characterised by a focus on heavy industry, infrastructure and electrification. This influence came about both because cadres having their education from Soviet universities gradually have replaced professional revolutionaries in the top leadership, and through Sino-Soviet technology co-operation projects.<sup>263</sup>

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<sup>262</sup> This expression connotes a narrow understanding of technology, not the broad definition employed in this study.

<sup>263</sup> Personal communication with Professor Harald Bøckman, University of Oslo, 19 March 1999.

Ho (1997: 102-103) writes that, as China had difficulties absorbing new technology during the early 1980s, Chinese policy makers gradually started to define technology more broadly to encompass organisational and management skills and know-how rather than just engineering in a narrow sense. However, he continues, “Chinese managers and bureaucrats continued to place a higher value on ‘hardware’ (equipment and machinery) than ‘software’ (codified and tacit knowledge)”. Incremental technological improvements are regarded as uneconomical. This is rooted in a desire to minimise the technological gap to the North within as short a period as possible.

As bureaucratic authority is fragmented in China, many agencies may potentially obtain the responsibility for implementing a particular project, and all seek to position themselves in order to acquire this responsibility. In China, where competition for public funds is fierce, projects require the commitment of large public funds and a considerable number of public and private actors, an objective means of comparing possible solutions is in demand. Technology is often given this role. Thus, a reasonable hypothesis could have been that the less successful agencies implementing an environmental technology project are in tactically interpreting the technology to be used in a project in ways that suit their own organisational interests, the less likely it is that the implementation status of the project will be positive.

In measuring how successful implementing agencies are in tactically translating technology, a starting point could be to focus upon whether or not the dominating interpretation of the following has moved in a direction that will increase their organisational strength:<sup>264</sup>

- what kind of technology that was to be implemented through the project;
- who the intended user of the technology should be;
- in which context the technology is to be used, and how.

### **7.3 Summary and conclusion**

Summing up, three (not mutually exclusive) categories of factors contribute to explaining the implementation status of the Yantai project. The first category of factors consists of those

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<sup>264</sup> In terms of personnel, jurisdiction, and national and international organisational linkages, respectively, cf. Section 2.2.3.

contributing to the discontinuation of the Sino-Norwegian technology co-operation. The planning and foreign financing bureaucracies were neither integrated in CA21 at large or the Yantai project as such and therefore did not give priority to the project. This made it impossible for the implementing agency to provide funding and approval of its repayment capabilities in time, which led to the cancellation of the co-operation project. The highly negotiated central-local relationship regarding responsibilities for project funding and the fact that the project had not been anchored among the local authorities probably also contributed to the funding problems, and perhaps YMSSB's lack of relations with possible funding sources as well.

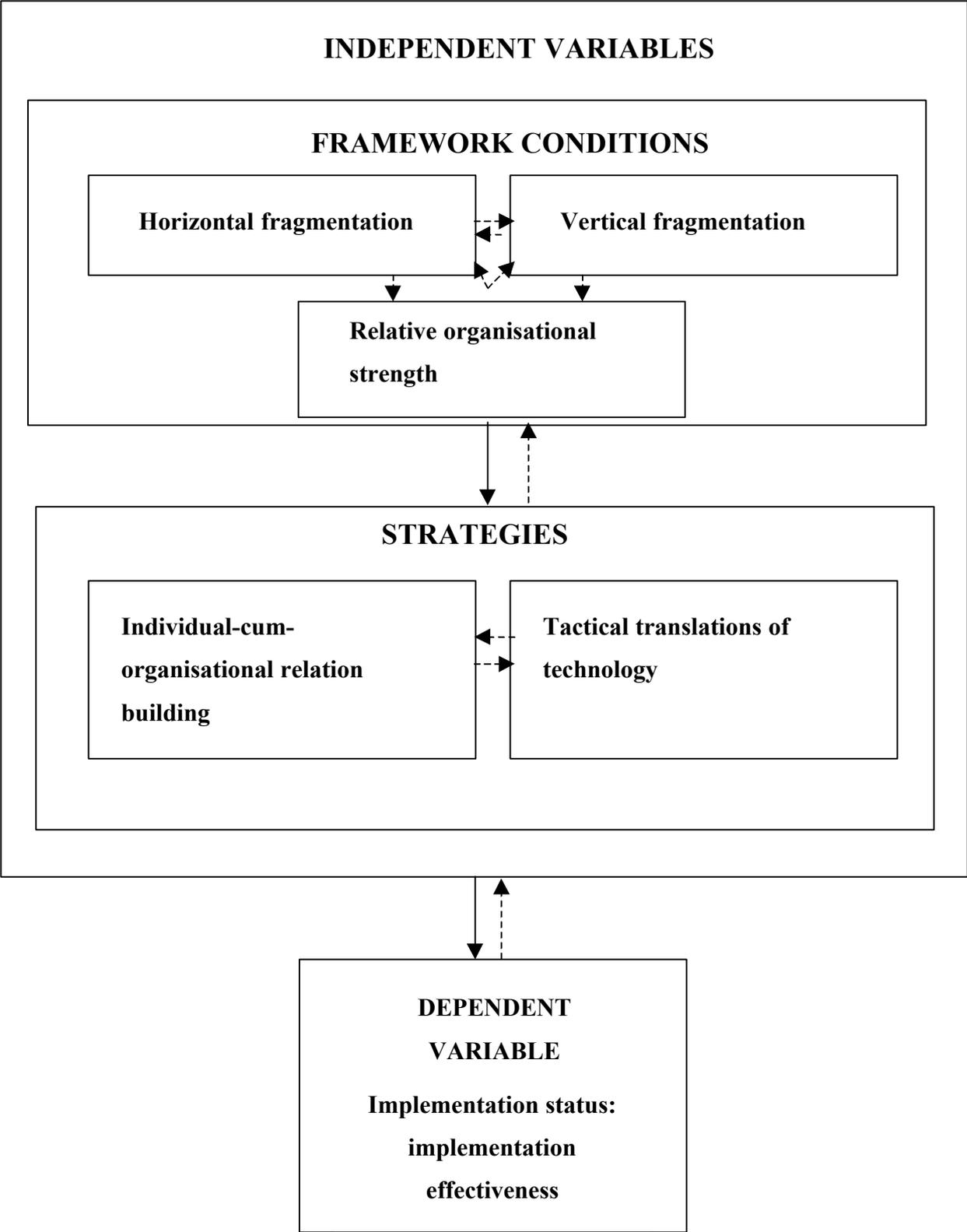
The second category consists of those factors having influenced the technological profile of the project: the lack of co-ordination between the CA21 administration and the implementing agency (MOC), and the relative strength of MOC compared to its opponents in the issue area of marine oil pollution. Perhaps the tactical translation of technology by MOC or the differing technological frames among the actors implementing the project should also be included here.

The third category is composed of those factors that render a comprehensive and co-ordinated follow-up of the Yantai project rather unlikely. That includes the lack of co-ordination between the CA21 administration and implementing agencies; the lack of co-ordination of Local Agenda 21 initiatives and CA21 priority projects; the lack of a CA21 administrative structure on lower administrative levels; the separate agenda of YMSSB and its rivalry with other harbours for the Yantai project; and the relative organisational strengthening of the environmental bureaucracy, which had been ostracised from the CA21 process.

As employing structural variables arguably succeeded only partly in establishing clear causal linkages to indicators of implementation effectiveness, it has been suggested to integrate relevant actors' strategies in the analytical framework as well. The main reason is that in order to be able to establish clear-cut causal mechanisms from independent to dependent variables, the analytical framework needs to be dynamic in the sense that it incorporates both structures and the actions of actors influenced by these structures. The conclusions are summarised in the revised analytical model on the next page. The dotted lines in the model indicate that there are interrelationships between independent variables as well as a feedback relationship from the dependent variable to the independent variables (actors' actions are influenced by structures,

but these actions also change these structures). This thesis only focuses on the relationships between variables that are marked by solid-drawn lines.

**Figure 7.2 Revised analytical model integrating organisational framework conditions and relevant actors' strategies**



“Changes will take place when things come to a dead end, and breakthroughs can be expected when there is no way out”

*Chinese aphorism*

## **8 Conclusions and theoretical implications**

This chapter consists of two parts: conclusions and recommendations, and theoretical implications. The first part starts by summing up the most important findings of the study, as regards the influence of organisational framework conditions on the implementation of environmental technology projects in China, exemplified by CA21 Project 6-8 in Yantai. A short note on the prospects of China's Agenda 21 follows. Third, a number of factors central for successful implementation of environmental technology projects in China are suggested. Following this is a short reminder of the implications China's Western development strategy and its World Trade Organisation (WTO) accession might have for the implementation of environmental technology projects in China. Fifth, implications of the Yantai project for greenhouse gas abatement projects in China and other countries in the South as part of the Clean Development Mechanism under the Kyoto Protocol are suggested. The final point is some thoughts on what implications new types of environmental technology will have for the organisation of development aid, inspired by the Yantai project.

The second part of the chapter, focusing on theoretical implications of the study, will first discuss its implications for research on environmental technology policy implementation in China. Secondly, the possibilities of linking research on international environmental commitments and domestic environmental technology politics is explored, based on the agent-structure debate.

### **8.1 Conclusions: The 21 Agendas**

The main question this thesis set out to answer was how organisational framework conditions within the People's Republic of China influence the implementation of environmental technology projects in the country. This was illustrated through a case study of the implementation status of a project for prevention and control of oil spills, included in China's Agenda 21.

The argument was the following: the more horizontally and vertically fragmented authority is among the governmental actors involved in the implementation of the Yantai project, the less likely it is that the implementation status of the Yantai project is positive. Given that authority is fragmented horizontally and vertically: the weaker the agencies implementing the Yantai project are compared to organisational opponents of the project, the less likely it is that the implementation status of the Yantai project is positive. The empirical documentation and analysis conducted in the thesis strengthened these hypotheses, with some modifications.

While not integrated in the analytical framework, a linkage was suggested between the prevalence of horizontal and vertical fragmentation of authority, relative organisational weakness of implementing agencies, and two types of actor strategies. In this way, the analytical framework comes closer to establishing clear-cut causal mechanisms from independent to dependent variables in the sense that it incorporates both structures and the actions of actors influenced by these structures.

It was suggested that the less successful implementing agencies are in individual-cum-organisational relation building with strategic partners, and in tactically translating the technology to be used in the project to suit their own organisational purposes, the less likely it is that the implementation status of the Yantai project is positive. Integrate relevant actors' strategies in the analytical framework as well. The main reason is that in order to be able to establish clear-cut causal mechanisms from independent to dependent variables, the analytical framework needs to be dynamic in the sense that it incorporates both structures and the actions of actors influenced by these structures. The conclusions are summarised in the revised analytical model below.

CA21 Project 6-8 was on its way to being implemented at the time the case study ended in mid-1999. However, the implementation status of the Yantai project was judged as being sub-optimal according to the criterion of implementation effectiveness, as four aspects of the implementation process had deviated substantially from the expected effect and/or planned outputs. Below, these will be reiterated, and the particular aspects of the organisational framework conditions and actors' strategies believed to influence them are pointed out.

The first sub-optimal aspect of aspect of CA21 Project 6-8 was the discontinuation of the Sino-Norwegian technology co-operation. This is mainly explained by the lack of integration of planning and foreign financing bureaucracies in CA21 at large and the Yantai project in particular, and the subsequent lack of priority given to the project by these bureaucracies. The central-local dimension of the fight for foreign funding probably also contributed to making Sino-Norwegian co-operation more difficult. YMSSB's lack of relations with possible local funding sources, especially local authorities, could also have been an important problem in this regard.

YMSSB's excessive focus on technical aspects of technology co-operation (as opposed to MOC) contributed to a reduced focus on capacity building in the project. This narrowing of the project's focus from technology towards technicalities was also an indirect reason why the Sino-Norwegian co-operation ended prematurely.

The changed technological (and geographic) profile of CA21 Project 6-8 was caused by a lack of co-ordination between CA21 administration and the implementing agency (MOC), as well of ACCA21's lack of capacity to follow up the project locally. The relative organisational strength of MOC compared to its opponents in the issue area of marine oil pollution was an important reason why the project was implemented at all despite the problems of horizontal and vertical fragmentation of authority. Other contributing factors could be the tactical translation of technology by MOC, or the differing technological frames among the actors implementing the project.

A comprehensive and co-ordinated follow-up of the Yantai project is rather unlikely. Some of the reasons are that co-ordination between the CA21 administration and implementing agencies has been and is limited; that there is a lack of co-ordination between Local Agenda 21 initiatives and CA21 priority projects; that CA21 lacks and administrative structure on lower administrative levels. Other contributing factors have been the separate agenda of YMSSB and its rivalry with other harbours for the Yantai project, as well as the relative organisational strengthening of the environmental bureaucracy, which has been ostracised from the CA21 process. Furthermore, at an operative level, the responsibilities in an emergency situation between YMSSB directly under the central government, and the local government, seem unclear.

This picture is rather disturbing, both seen from the point of view of domestic sustainable development policy and foreign environmental aid. Horizontal and vertical fragmentation of authority within the decision making apparatus of the recipient society contributes to a situation where many Sino-foreign technology co-operation projects might fail in terms of capacity building, sustainability and replicability – which are among the most important success criteria for such projects. However, the negative values on these variables seem difficult to get to grips with, as they are caused by a host of different structural characteristics of bureaucracies and the relationships between these bureaucracies. In this situation, there may well be as many agendas as there are actors, cf. “the 21 agendas”, the title of this section.

It seems that, in the fight for foreign funding and the prestige related to foreign-funded projects, many central-level bureaucracies promote themselves as having a much broader scope of authority than what is actually the case. They offer a long list of projects to be implemented, while in practice they neither have the funds to contribute the domestic share of these projects, nor the authority to implement them.<sup>265</sup> They therefore depend on the support from other bureaucracies centrally, and the co-operation of local-level subsidiaries and local governments. Many of these actors compete for the same type of projects and have their own list of projects to be implemented. The result is that many projects listed by central bureaucracies for implementation are never implemented.

Another interesting element revealed by the analysis is that implementation might be more slow in a situation where important and established actors are left out of formulation and implementation processes, than if all relevant actors are given an opportunity to have their say at an early stage.

The Yantai project is not a success story. However, it is not a tragedy either; after all, at least some parts of the original project have been implemented, which for example is much more than can be said about the other CA21 projects in which Norwegian business and government agencies were involved. It is likely that these characteristics make the Yantai project more or less representative for Sino-foreign environmental technology co-operation projects.

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<sup>265</sup> Interview PHKN1.

### 8.1.1 Prospects for China's Agenda 21

Paradoxically enough, China's Agenda 21 has seemingly never been lower on the agenda of China's decision-makers than now, after the turn of the 21<sup>st</sup> century. The scope for cross-sectoral co-ordination through CA21 seems reduced, as the position of both bureaucracies supposed to share leadership over CA21 (MOST and SDPC) has been weakened, together with the position of some of the leading personalities behind CA21. Rivalling programmes have been initiated. In the future, CA21 is likely to be regarded as one in a large number of initiatives whose aim is to compete for foreign funding.

The 1998 government restructuring led to a relocation and reshuffling of many of the departments and individuals working with Agenda 21 earlier. Furthermore, although this is hard to assess at this point, it is likely that CA21 activities were among that were given low priority when cuts in responsibilities and staff had to be done as part of the restructuring. The result was that the Agenda 21 activity in China was lower than previous years, and that new responsible departments and individuals have had to use the period up until today to consolidate their activity. Much as a result of the 1998 restructuring, MOST and SDPC are currently discussing how to build upon the Agenda 21 concept, in what may be called a "20 Years Action Plan".

Furthermore, it is important to notice that the CA21 has made a considerable contribution in terms of opening new channels of communication in questions of sustainable development, between actors that had previously had no formal contact whatsoever. It is therefore reasonable to believe that CA21 – both on a general level and in terms of the technologies and strategies related to each of the priority projects implemented – has influenced the structures in which it was introduced. It is also generally agreed that many good projects have been funded through CA21.

The Agenda 21 catchword is "Think globally and act locally!". For a process with such a purpose, China's Agenda 21 has been very top-heavy, in the sense that it has been formulated by central government actors and is supposed to be implemented locally. This is a paradox, as it does not exactly encourage the genuine public participation promoted in Agenda 21. However, China's top-down approach has had the advantage that local agencies have been given a clear signal that CA21 is a priority, and the authority to implement initiatives

(primarily Local Agenda 21s, but also other priority projects) on their own (Gan L. 1999: 321, Finamore 1998: 4). It should also be noted that several local Agenda 21s have been established because of local initiatives – in villages in Henan and Yunnan, some of China’s poorest regions (Gan L. 1999: 321). Furthermore, researchers seem to have been integrated more in decision making on sustainable development through CA21 than has been the case in China before.<sup>266</sup>

It must be assumed that quite a number of the CA21 projects have not been successfully implemented – quite a number probably never even reached the implementation stage. However, this is not necessarily only a negative thing; many of the projects should never have been included in the Priority Programmes anyway. The fact that many projects were revised in 1996 suggests that CA21 has increased Chinese bureaucracies’ understanding of project planning and communication. CA21 has contributed to raise the environmental awareness of ordinary people. It has also increased dialogue between Chinese sustainable development actors and international (business, government and non-government) expertise. Furthermore, ACCA21 is a far more professionally driven organisation now than when it was established in 1993. Not only is it trying to attract international business through its Centre for Environmentally Sound Technology Transfer, but it is also the operative responsibility of China’s very ambitious Local Agenda 21 programme. However, the following outburst from the leader of one of the emerging quasi-governmental environmental organisations in China suggests CA21 has so far not managed to make use of this resource:

“Why should we participate in China’s Agenda 21? We have not been invited, and if we were invited, we would have declined. We have no interest in coming to a party only to end up sitting in a corner watching the other guests. China’s Agenda 21 is one of the illusions of the spoiled children of the Party bosses, who walk straight into top-level administrative positions. It has nothing to do with us.”<sup>267</sup>

CA21 has also contributed to an increased understanding on the part of Chinese authorities of the seriousness of environmental problems on the part of Chinese decision-makers. Before the formulation of CA21, the official view was that China was a developing country and environmental problems only could be solved when China had reached a higher stage of development. However, after the Rio summit and the formulation of CA21, the official view was that the environment and development challenges must be met in parallel. CA21 also

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<sup>266</sup> See Section 8.2.1 for more discussion on aspects of participation in CA21.

<sup>267</sup> Interview N6.

seems to have resulted in environmental criteria being introduced into economic and development plans to a somewhat larger extent than before (Gan L. 1999: 319).

### 8.1.2 Success factors

The hypotheses on which the conclusions in this thesis are based were formulated “negatively”, that is, it was expected that the more prominent the phenomenon described by a particular variable was, the less likely it would be that the Yantai project was successfully implemented. However, formulated in a “positive” manner, these hypotheses may also form the basis for a set of domestic organisational success factors for implementation of environmental technology projects in China, even though they should not be regarded as a definite list.

- *Horizontal co-ordination*: Most or all bureaucracies whose jurisdiction is close to or covering the issue area are brought into the implementation process at an early stage (see below for details).
- *Vertical co-ordination*: Lower-level satellites are integrated in the implementation process at an early stage, and dialogue opened with local and provincial-level authorities within (at least) the areas of planning, financing, and foreign economic co-operation.
- *Organisationally strong implementing agencies*: The competence, jurisdiction, number of personnel and financial resources of the implementing agency or agencies is larger than that of possible bureaucratic rivals in the project’s issue area. Or even better: the project or programme is safely within the jurisdiction of the bureaucratic actor claiming responsibility for implementation.
- Individual-cum-organisational relation building is actively used by implementing agencies to “defragment” or “concentrate” decision-making, by minimising the number of actors and decision-making arenas, maximising access to information, and reducing the time spent on project preparation and implementation.
- There is a high degree of consensus on what technology should be implemented through the project, where, and by which bureaucracy. This consensus needs to be refreshed several times during the implementation process in order to decrease the scope for tactical redefinitions of technology in the interest of particular bureaucracies.

In addition, the following recommendations are made:<sup>268</sup>

*Hold consensus conferences:* Environmental technology co-operation must be based on the needs of countries in the South in order to be effective (OECD 1994: 9). As many stakeholders as possible should be included in the definition of these needs. This is perhaps even more important in the case of China, due to the serious vertical and horizontal fragmentation of authority, and ensuing institutional infighting. Consensus conferences involving all relevant stakeholders in a particular environmental technology project should be held as early as possible in the project planning and implementation process.<sup>269</sup> Here, all actors should be given the opportunity to voice their interpretations of what kind of technology that is to be the at the centre of technology co-operation, how this technology matches their needs, and how they perceive their role in the distribution of implementing responsibilities. While consensus may often not be reached, vetoing and technological manipulation may be reduced through consensus conferences, as may the risk for a protracted and disjointed implementation process.

*Co-ordinate capacity-building and technology co-operation:* Chinese decision-makers as well as bi- and multilateral aid agencies should make more effort to *secure the follow-up of capacity-building and/or pilot projects*. Focus should be moved from the details of technology transfer towards the linking of the knowledge and organisational components of such transfer with actual utilisation of transferred equipment in a Chinese setting, and extensive co-operation between Chinese and foreign key competence from an early stage. Projects focusing *on capacity building for comprehensive, integrated planning*, preferably in (issue) areas characterised by interregional and interministerial disputes, should be initiated, in co-operation with foreign donors. Perhaps it is a good idea to concentrate development aid on programmes rather than projects, like many countries in the North seem to be doing now. However, if this is done in China, support should perhaps be earmarked for specific purposes – especially capacity building within the bureaucratic unit administering the programme in question, as these units are established in parallel with the preparations of the programme.

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<sup>268</sup> An earlier version of this paragraph has been published in Buen (2000a, b).

<sup>269</sup> The reader should be aware that “consensus conferences” often describes a new form of technology evaluation where lay people prepare questions and ask a panel of experts about one or several controversial scientific or technological subjects, assess experts’ responses, reach a consensus about the subject, and report the conclusions at a press conference (see e.g. Sclove 1999 or Guston 1999 for more details on consensus conferences). Here, the expression is used somewhat differently.

*Work through non-state environmental organisations:* Although this is perhaps still politically difficult, the growing role of China's (non-)state environmental organisations as mediators, meeting arenas and co-ordinating agents in interministerial and interregional projects should be taken more seriously. Initiatives integrating China's own environmental organisations in policy-making and strengthen their administrative capacity would perhaps also create a stronger internal pressure for political reforms in China – hopefully this will happen so gradually that the organisations are allowed to work undisturbed.

### 8.1.3 Westward ho?<sup>270</sup>

Two emerging factors will probably significantly influence China's environmental technology policies in the time to come. Both are related to the fact that China is going West. However, China's interest for what the West has to offer has a different meaning in each of the two cases. The first is China's enormous initiative under the 10<sup>th</sup> Five-Year Plan (2001-2005) to stimulate growth in its backward Western region, while the second is the preparation for China's entrance into the WTO.

As noted above, Yantai is situated in one of the most prosperous areas in China. However, during the period covered by the 10<sup>th</sup> Five-Year Plan, Chinese authorities will invest considerable sums of money in projects in China's economically backward interior provinces, through the Great Western Development Strategy (*Xibu Da Kaifa*) (Schlevogt 2000, Sims and Schiff 2000).<sup>271</sup> The strategy will mostly focus on basic infrastructure, but also on environmental protection – to secure social stability. The Chinese authorities will shift the majority of government spending from coastal provinces to the West, and are intensifying their efforts to convince foreign investors to pour their money into such projects as well. The increasing emphasis on poverty alleviation also leads aid agencies in countries in the North towards projects in China's poorer provinces. This implies that especially environmental aid, but also environmental foreign direct investment (FDI), to an increasing extent will focus on the less-developed parts of China in the coming decades. It is reasonable to believe that the problems of horizontal and vertical fragmentation, weakness of the proponents of environmental technology, and strategies of individual-cum-organisational relation building

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<sup>270</sup> The exclamation "Westward Ho!" is American, and was probably first used among the settlers crossing what is now the U.S. looking for uncharted land.

<sup>271</sup> See also U.S. Embassy Beijing (2000).

and technological tactics are more widespread in less-developed areas of China than in the relatively prosperous Eastern coastal area.

The proponents of a proactive sustainable development policy in China may receive some unexpected assistance in their efforts from the WTO. Agreements under the WTO include the publication of laws likely to affect international trade, which may support China's efforts at creating more transparent and predictable environmental legislation. This may open for international and domestic pressure for public notice and debate of proposed environmental laws in China, indeed in the participative spirit of CA21.

#### 8.1.4 Implications for greenhouse gas abatement projects in China

Although the Sixth Conference of the Parties (CoP-6) to the UN Framework Convention on Climate Change (UNFCCC) has not yielded the expected results so far,<sup>272</sup> it is likely that the flexible mechanisms to assure cost-effective reductions of greenhouse gas (GHG) emissions will be applied within a relatively short time frame. The Clean Development Mechanism (CDM) is the only one of these mechanisms focusing on non-Annex-1 countries like China.<sup>273</sup> China is likely to be one of the chief beneficiaries of the CDM, as there are numerous opportunities for low (or even negative) cost projects reducing GHG emissions in the country.<sup>274</sup> Therefore, the results of the Yantai project are thought-provoking.<sup>275</sup>

Despite the fact that the implementation status of the Yantai project is judged to be sub-optimal, it must be considered a rather normal project as regards implementation success so far, in a Chinese perspective. If this assumption is correct, it is reasonable to believe that many proposed CDM projects in China will not be implemented at all, or that they – if they are implemented – will yield poorer results than the Yantai project.

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<sup>272</sup> Originally, CoP-6 was to be held 13-24 November in The Hague, the Netherlands. However, the CoP-6 has been extended until May 2001, when the Parties will convene once more. The reason is that the Parties failed to reach agreement – chiefly over how and to what extent to account for terrestrial uptake of CO<sub>2</sub>, and whether or not there should be a quantitative ceiling on the level of international carbon trading vs. national emission reduction efforts.

<sup>273</sup> The idea behind the CDM is that (companies in) Annex-1 countries (roughly equalling the industrialised world, including Russia and Eastern Europe) can acquire certified emission reductions (CERs) for projects implemented in non-Annex-1 countries, while the non-Annex-1 countries benefit from funding and technology transferred through these projects. The other two flexible mechanisms under the Kyoto Protocol are Joint Implementation (JI, or Activities Implemented Jointly (AIJ)) as such activities have been denoted in the trial period) and international emission trading (IET), respectively.

<sup>274</sup> For a more thorough argument, see Buen and Tangen (2000).

These conclusions should be added to the fact that the main headache for negotiators trying to hammer out the detailed rules and guidelines for the CDM is to balance the following two conflicting considerations:

- monitoring CDM projects as close as possible, in order to assure that they indeed produce the stipulated emission reductions; and
- reducing transaction costs related to CDM project implementation, to assure that a larger proportion of the Annex-1 countries' emission reductions is conducted through CDM projects, as opposed to and not JI projects or IET.<sup>276</sup>

Based on the experiences from the Yantai project, it is reasonable to believe that many of the CDM projects actually *being* implemented will not yield the stipulated CERs unless they are closely monitored during implementation.<sup>277</sup> If the Yantai project were a CDM project, it probably would not qualify for such credits either. This brings us back to the dilemma of monitoring vs. non-Annex-1 country focus. If Chinese and other CDM projects were to be subject to rigid monitoring and reporting procedures, many of them would never be implemented in the first place, because actors in Annex-1 countries would regard JI projects or IET or even in-house improvements as a more cost-effective way of reaching their emission reduction targets.

The CDM has much in common with ordinary FDI. If we assume that FDI flows to countries where transaction costs are low, the outlook for the CDM seems rather grim. The reason is that China is unrivalled among non-Annex-1 countries when it comes to attracting foreign direct investments, and is highly regarded by multilateral aid institutions due to its willingness and ability to meet payments. In other words, the transaction costs related to the implementation of CDM projects are likely to be *lower* in China than in most other countries eligible for such projects. In sum, this suggests that for CDM projects to be attractive for Annex-1 investors, criteria for obtaining CERs from such projects should neither be very strict nor be monitored rigidly, unless they are subsidised.<sup>278</sup> Whether this makes CDM projects attractive in a

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<sup>275</sup> Obviously, projects for the prevention and control of oil spills would not be eligible for CDM funding. However, this is irrelevant, as the point to be made here is that the characteristics of the implementation process of the Yantai project may be typical for other types of projects in China as well.

<sup>276</sup> Many views of what should be understood as transaction costs exist – often, the view of such costs promoted by economists is less comprehensive than the view held by e.g. political scientists. Being a political scientist, I understand transaction costs as costs related to the administration of CDM *as well as* regulatory costs related to project implementation.

<sup>277</sup> It must be emphasised that this can so far only amount to speculations, as the exact rules and guidelines for the CDM are not yet agreed upon.

<sup>278</sup> This conclusion rests on the assumption that companies from and authorities in Annex-1 countries are conscious of the real transaction costs related to CDM project implementation. It is likely that such costs will be underestimated – especially those types of costs that are hard to quantify, and especially until relevant Annex-1 actors gain project implementation experience from CDM projects.

sustainable development perspective is another question, which will not be elaborated upon here.

### 8.1.5 Towards avoidance technology

In the introduction, the international stalemate on North-South technology co-operation was discussed. It is therefore interesting to reassess this issue in the light of the thesis' conclusions. If other case studies of other Agenda 21 projects for international environmental technology co-operation yield similar conclusions as this study, the technology transfer strategy evident in Agenda 21 and Earth Summit + 5 should be reassessed.

The first point that should be reassessed is the emphasis on advanced technology. As mentioned in the introduction, on both occasions the necessity and value of transferring *advanced* environmental technology from North to South was emphasised, claiming such technology promises the largest environmental and economic benefits. However, the advanced research and development of environmental technology has shifted from control and remediation/restoration technologies via monitoring and assessment technologies towards avoidance technologies (technologies that avoid the production of environmentally hazardous substances or alter human activities in ways that minimise damage to environment). This means that environmental technologies are becoming increasingly *complex*, *costly*, and *codified*, and require *cross-disciplinary* competencies in order to function properly. In the field of marine oil pollution, this could for example mean that focus would be put on how to reduce oil consumption, how to reduce oil transport, and how to prevent oil spills, rather than on oil spill clean-up. In sum, this suggests that non-technical aspects of technology will become increasingly important. However, as mentioned in Section 8.1.4, factors inhibiting implementation of environmental technology projects are probably even more prominent in other countries in the South. Thus, rather than transferring the most advanced technology to these countries, technological co-operation strategy based on thorough assessments of each recipient country's capacity for utilisation of environmental technology, and gradually building up capacity from this level onwards, might yield better results for recipient countries.

There are a number of problems hampering the practical implementation of such a strategy. The first is the reluctance of countries in the South towards settling for "second-best technology". This has characterised all discussions on environmental technology transfer and

co-operation related to international environmental negotiations the last decades, including Agenda 21, the climate negotiations, and the negotiations on the implementation of the Montreal Protocol. China has been among the most outspoken on these matters (see e.g. Tangen, Heggelund and Buen, forthcoming).

The second problem is that of proprietary technology. The rollback of the state in the North throughout the recent decades renders direct public interference in private sector technology development and commercialisation difficult. Nevertheless, countries in the South push for easing the intellectual property rights in the realm of environmental technology, in the name of sustainable development.<sup>279</sup>

Given that tangible technology and property rights to technology are central requirements on the part of countries in the South, a strategy coupling the attainment of these objectives with momentum in the implementation process and the sustainability and repeatability of pilot projects would be beneficial for both parties. A system close to that of extended producer responsibility could be introduced in environmental aid. Environmental technology companies exporting hardware to countries in the South could get favourable aid conditions if and only if they agree to follow a long-term programme of several projects in different areas under different conditions, and including capacity building, developed by both countries taking part in the technology co-operation. Another objective of such a mechanism should be to ensure close co-operation between those companies or research institutions responsible for capacity building on the one hand and those responsible for hardware vendors. However, this also depends on co-operation within development aid bureaucracies in the North, between departments responsible for industrial involvement in development aid projects, and departments in charge of capacity building projects, respectively.

There is a worldwide trend towards reductions in ODA, both in absolute terms and as a percentage of funding for technology transfer and co-operation projects in countries in the South (IPCC 2000). However, some countries in the South have succeeded in attracting a growing amount of foreign direct investment. China is currently a global number two when it comes to attracting this kind of financing. Of course, just a portion of these investments is related to environmental technologies. Nevertheless, future research on North-South

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<sup>279</sup> This was emphasised by interviewee G9. See also Huang (1998: 6).

environmental technology co-operation should focus far more on the increasing role of private actors.

## **8.2 Theoretical implications: Domesticating international theories, or internationalising domestic ones?**

As noted in the introduction, this study is directed towards explaining the empirical phenomenon of the (lack of) implementation of environmental technology projects in China. Nevertheless, a few theoretical reflections follow.

### **8.2.1 Implications for research on environmental technology policy implementation in China**

This section contains several suggestions for enriching research on environmental technology project implementation in China. They could be summarised in (i) the need to include other categories of framework conditions in analyses; (ii) the emergence of quasi-governmental structures in the environmental sector because of government streamlining; and (iii) the need to “globalise” the social construction of technology (SCOT) model.

*Other categories of framework conditions should be integrated in analysis:* The empirical results of the thesis suggest that further studies on factors influencing the implementation of environmental technology projects in China should focus not only on organisational framework conditions but integrate such perspectives with institutional, cognitive, technological and – especially – economic framework conditions.

The Yantai project is a good illustration of the importance of including cognitive-informational framework in analyses of environmental technology policy implementation in China. Although environmental consciousness in China has grown the last decades (see Sections 8.1.1, 8.1.2 and 10.3.1), the participative aspects of CA21 have not been very prominent. Nor has public participation characterised the Yantai project; the combination of the fact that the project did not explicitly include public consultation and low environmental consciousness locally has meant that there has been no public pressure to implement the project.

A major reason why many of the interviewees emphasised the importance of economic factors for the outcome of the Yantai project may be a narrow understanding of technology and of the

complex process of transferring technology from one context to another. Nevertheless, the empirical evidence clearly shows that the vague division of responsibility and widespread insecurity related to China's ongoing economic reforms has affected the fate of the Yantai project. Lack of financial capacity on the part of implementing agencies was also an important factor inhibiting further Sino-Norwegian co-operation. In particular, the increasingly active role of the banking and financial system should be focused upon. The Yantai project was also the story of a central government agency that had yet to be accustomed to a reality where loans were given on commercial rather than political terms, and where economic power lies with local actors rather than the central government.

Commitment by local authorities is essential for environmental technology projects to succeed in China. The problem, however, is that it is exactly at the local level that the alleged contradiction between environmental protection and economic growth has become most obvious. The challenge is to understand better the contradictions between economic goals of local and provincial governments with national environmental goals, and to carve out ways and means to reconcile these goals.

The study has indicated that there is a need to enrich the fragmented authoritarianism model by perspectives focusing more on the politics of particularism, that is, the role of personalism and particularistic ties in Chinese politics. If such perspectives are neglected, theories of Chinese politics easily become static, as the actor perspective is missing and only structures are left to analyse. Furthermore, such analyses should not be restricted to the top layers of the Chinese decision making hierarchy.

As this study has tried to contextualise the implementation process of a single technology co-operation project, it has much in common with theory on "national systems of innovation" (Edquist (ed.) 1997, Lundvall 1992). This perspective, rooted in the tradition of evolutionary economics, broadens of analysis from the focus on the firm to the whole society's ability to bring forth new innovations in a competitive international environment, decided by a complex interaction of technical, economic and social changes. Knowledge and the process of acquiring knowledge are central in this approach, as are the linkages between firms, between firms and customers, and between firms and R&D institutions. In this perspective, a single transfer of

technology is of minor importance.<sup>280</sup> Analyses of China's capacity to exploit the potential for environmental technology co-operation should seek more inspiration from such theories than this thesis, which only to a very limited extent has thrown light on the role research and development institutions play in implementation of environmental technology projects. Integrating national innovation systems theory with the framework provided in this thesis would perhaps also render it possible to discern research from administration and politics in the categorisation of framework conditions, which is not the case in Jänicke's typology.<sup>281</sup>

*Restructuring of central government – the role of centres and GONGOs:* ACCA21 is only one of a steadily increasing number of centres more or less closely affiliated to the governmental structure in the environmental field. This development is another consequence of the gradual transformation of many government agencies to market actors – with Chinese characteristics. The objectives of the 1998 restructuring of the central government were to reduce the staff of the central government bureaucracy by fifty percent, to separate government functions from those of the market, and (closely related to the latter objective) to separate co-ordinating and policy-making functions from those related to implementation. The trimming of government continues on top level, and is planned on lower governmental levels as well. It would be very interesting to examine to what extent the reductions in manpower are real or only on paper. The environmental bureaucracy is a very interesting case in point, as it was awarded more responsibilities because of the restructuring process. Has the restructuring process made the remaining government officials work twice as much as before? Probably not, as they draw on the growing environmental non-state sector affiliated to the government agencies. Establishing new centres and government-organised NGOs (GONGOs) is both a way of gradually slimming the bureaucracy, attracting foreign funding, and helping formulate and implement policies. What centres seem to lack in terms of seniority, they often regain by being competent, efficient and entrepreneurial, and have many international contacts. Government funding for the newly established centres is to be gradually reduced to nothing the next three to five years. Thus, the fight for foreign funding will be even tougher in the future.

*“Globalising” the SCOT model:* While the thesis focused on differing interpretations of technology among the Chinese bureaucracies involved in the Yantai project, the discontinued

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<sup>280</sup> Contributions focusing on industrial clusters could also be mentioned here (see Porter (1990) for an introduction, or Schmitz and Navdi (1999) for a contribution focusing on industrial clusters countries in the South in particular).

<sup>281</sup> On the other hand, the relevance of such a distinction is questionable in a country like China, where research institutions (e.g. the Chinese Academy of Sciences) are given ministry-level authority, and ministries and commissions resemble universities (SETC had more than 200 affiliated research institutions in 1999, according to interviewee R1).

Sino-Norwegian co-operation also exemplified that representatives from different socio-cultural settings might interpret a particular technology in different ways. In the terminology used by the social construction of technology (SCOT) model, this implies that a technology transferred to a new socio-political context is destabilised; the technological “black box” is reopened for interpretation. In other words, there is a considerable scope for interpretative flexibility in technology co-operation projects. While this renewed interpretative flexibility may be utilised strategically position in bureaucratic struggles, but it also opens a window of opportunity. As Bijker (1995) notes, people belonging to more than one relevant social group might see an artefact in new and unconventional ways, because more than one technological frame is integrated. This signals that more pathbreaking environmental technology ideas and technologies in the future might originate from the re-innovation processes emerging from North-South environmental technology co-operation.

However, as mentioned in Section 7.2.2, the SCOT model has been developed almost exclusively on the basis of case studies of technology development and change in the Western Hemisphere. Therefore, in order to be a fruitful theoretical tool for analysing North-South technology co-operation, the model needs to be adapted to framework conditions and strategies prevalent in countries in the South, through more case studies like the one conducted in this thesis. These case studies need to take into account two factors. First, technology development and change is not necessarily a once-and-for-all linear process towards stabilisation. Second, technology development and change might just as well take place elsewhere than in the industrialised North. In fact, it might even be more probable that such change happens there.

### 8.2.2 Exploring linkages between the domestic and the international arena: agent and structure revisited

This thesis indicates that domestic framework conditions and strategies might cause international environmental technology co-operation (e.g. under the Agenda 21 framework) to tumble. As such co-operation is often based on international environmental agreements, this signals that research on the implementation of environmental commitments should focus more upon the linkages between the international level and the domestic level.

Employing a strictly domestic-level implementation model in this study has had three important implications (Rosendal 1999: 225-226):

- 1) Analysis has gone beyond the idea of states as unitary, rational (Weberian) actors. Domestic models would not be necessary if we presumed that all governments acted according to the URA model.
- 2) Actor-level explanations have been given more attention, although (national) structural-level explanations have been focused most upon.
- 3) Focus has not been on the *willingness* of states to implement international commitments, but on their *capacity* to do so.<sup>282</sup>

The observation that understanding domestic political processes is necessary for a better understanding of international politics is not new (see e.g. Allison 1971). Nevertheless, most studies of the implementation of international environmental commitments have so far taken the sovereign nation-state as their point of departure (Porter and Brown 1991: 35), concentrating their analyses on inter-governmental regimes and negotiations. The state “is largely left unexplored and confined to a ‘black box’” (Jakobsen 1999: 222), even though the role of state actors is considered crucial to outcomes (Hanf *et al.* 1993: 16).<sup>283</sup> Thus, domestic *structures* conditioning the actions of state *agents* are often neglected. Research on the implementation of environmental commitments seems to have neglected the fact that the state not only can be conceived as an agent acting within a structure – or system – of nation-states, but also as a structure in itself, in which governmental and non-governmental actors are embedded (Wendt 1987: 339).

Partly as an acknowledgement of the above, the focus of research on international institutions has gradually turned from studying their initial, formative phases towards studying their domestic operation.<sup>284</sup> However, this development has other reasons as well. Many environmental institutions were established in the 1970s, 1980s and early 1990s. Thus, it is increasingly meaningful to change focus from analysing the formation phase towards implementation output and outcome on the national level – “the decision, or output, is not the end of the story” (Rosendal 1999: 15). The fact that several of these analyses suggest that the institutions’ impact has not been too impressive, underlines the importance of a focus on domestic-international linkages (Haas *et al.* 1993, Keohane and Levy (eds.) 1996, Hanf and

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<sup>282</sup> The willingness approach is rooted in the traditional realist focus on compliance as a function of national interest. Lack of implementation is explained mainly by insufficient willingness on the part of the state as implementing agent – be it donor or recipient countries – assuming that states choose whether or not to implement a policy according to national interest (Keohane 1996: 25). Proponents of the ability approach, on the other hand, argue that states may fail in following up their international commitments because domestic conditions prevent them from doing so. However, Laugen (1995: 81-83) questions whether it is at all possible to distinguish empirically between willingness and ability, or to carve out objective criteria for when states really have tried and failed to implement an international commitment.

<sup>283</sup> A notable exception is Andresen *et al.* (1995: 5, 19).

Underdal 1998). There is increasing appreciation of the fact that successful implementation of international institutions' initiatives hinge on the capacity of recipient governments (Porter and Brown 1991: 25, Weale 1992b: 200, Keohane 1996: 7, Schreurs and Economy 1997).<sup>285</sup> International institutions are neither authorised to impose rules and regulations upon sovereign states, nor capable of implementing large-scale projects (Keohane 1996: 12). Furthermore, national and sub-national players, interests, rules and alternatives relevant to the follow-up of international commitments may change considerably from one point in time to another (Economy 1994: 25).

Such country-specific research has met considerable criticism, mainly on the grounds of parsimony; it is claimed that such an approach requires too much information, and produces conclusions that cannot be generalised (Zürn 1993: 286, cited in Rosendal 1999: 225). In my opinion, this criticism leads to a paradox. If it is correct that domestic analyses are marred with information overload and idiosyncratic conclusions, this just strengthens the argument against research disregarding national differences. The reason is that such research runs the risk of losing touch with reality due to insufficient information, and of producing generalities, not generalisations.

I consider it especially important to study domestic capacity to implement international environmental commitments in countries in the South. Many environmental problems are more severe there (Rosendal 1999). Furthermore, countries in the South are generally more vulnerable towards environmental problems, because their capacity to handle them is lower than that of countries in the North (Keohane 1996: 3, Murvoll 1997, Rosendal 1999: 228). After all, a major reason why developed countries transfer environmental technology to countries in the South is the concern that these countries lack the capacity to cope with certain environmental problems. Finally, most international environmental agreements largely excuse countries in the South from implementation obligations, thereby reducing the potential for external influence on policy implementation (Najam 1995a: 273).<sup>286</sup>

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<sup>284</sup> See e.g. Schreurs and Economy (1997: 1-18, includes a case study of China), Underdal (ed.) (1998), and Rosendal (1999).

<sup>285</sup> Keohane uses the term "organisation" here. However, while defining neither institutions nor organisations, Keohane and Levy (eds.) (1996) seemingly use the terms interchangeably.

<sup>286</sup> There are exceptions to this rule. One is the Convention of Biological Diversity (Rosendal 1999: 226), another is the fact that the Montreal Protocol, the Framework Convention on Climate Change and the Convention on Biological Diversity all include incentives for developing country participation in terms of financial and technology transfers, carrying with them the potential for influence on the part of the donor. In addition, the attitudes towards excusing countries in the South from international environmental commitments may change in the near future. For example, the United States opened the issue of commitments on the part of countries in the South once more before the UNFCCC COP-3 in Kyoto.

This problem touches the question lying at the heart of the so-called agent-structure debate, which has been touched upon in the analytical framework as well: On the one hand, the purposeful actions of human beings and their organisations are the only social forces that can (re-)produce or transform society. However, on the other hand, society is made up of social relationships, which structure the relations between these purposeful actors (Wendt 1987: 338). How can we develop a theory that incorporates the powers of agents as well as recognises the relevance of structural factors conditioning action (Dessler 1989: 443)?<sup>287</sup>

Most established social theories treat the properties of either actors or structures as given. Actions are either explained only with reference to agents (methodological individualism) or structure (methodological structuralism), meaning that the independent variable in both cases is taken for granted (Carlsnaes 1992: 250). Thus, what such approaches gain in terms of analytical parsimony, they lose because they cannot justify their theoretical claims about state action in a social theory of the state itself (Wendt 1987: 349).

A number of attempts have been made to construct an analytical approach that is making neither structures nor agents ontologically primitive entities, the most predominant of which is structuration theory (Giddens 1984). This theory regards agents and (potentially unobservable) structures as “ontologically distinct”, but “co-determined” or “mutually constitutive” entities (Wendt 1987: 360), treating their respective characteristics as *a priori* equally relevant for explaining social behaviour. Analysing agents and structures as deeply interrelated, yet distinct entities, implies that more emphasis should be given to contextual and historical approaches to the object of analysis. The relative explanatory importance of agents and structures, respectively, should be an empirical question, to be investigated in each particular research endeavour (Wight 1999: 115). Different states will have different “structures of autonomy” (Cerny 1990: 85), as uniquely developed structures interact in unique ways with particular agents.

A central problem in analysing macro-level framework conditions for micro-level environmental technology projects, is that while the most interesting research questions often seem to be found in the interface between agent(s) and structure, this makes it difficult for the researcher to choose the level of analysis. However, recent research within actor-network

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<sup>287</sup> The agent-structure problem is not synonymous with the debate on micro-macro linkages. The former largely is a European phenomenon, and focuses mostly on linkages between purposive action and social structures, while the latter is more common in the United States, and concentrates more on links between different levels of analysis (Carlsnaes 1992: 246).

theory has proved it fruitful to analyse technological development and technological co-operation from the perspective of *networks* rather than single actors (Akrich 1992, Law 1992, Bijker 1995: 251, Latour 1996).

According to actor-network theory, any unit that acts or causes action – be it technological artefacts, organisations, single human beings or nature – is defined as an actor. The actor and the network are integrated parts of a whole. The network is processes or transformations activated by the actor. As all actors are networks, and all networks in principle may be actors within larger networks, the distinction between structure and agency becomes a gradual one.<sup>288</sup> Networks are like structures, apart from the fact that no nodes or links in the network are taken for granted – they have to be researched casewise. All elements – be they human or non-human – have similar status (Law 1992). Elements in the network could be understood as scripts, prescribing roles other elements in the network should play (Akrich 1992).

As a given technological artefact is defined and analysed as an actor no different from a human being, actor-network theory may also be fruitful in order to avoid the pitfalls of technological and social determinism, respectively, in the analysis of technology. A given transferred technology may thus be analysed as a node in a network, and its ability to win recognition – and eventual weakening – can be assessed by the quantitative number and qualitative importance of its links with other actor-networks through time series analysis.

A key question remains: Which theoretical tools should be employed in studying domestic factors influencing the domestic implementation of international environmental commitments? In the opinion of Morawcsik (1993), the worst-case scenario is an *ad hoc* inclusion of possibly influential domestic factors into already existing theories of international relations. However, is the alternative to adapt theories of international relations in order to integrate domestic conditions, as Morawcsik argues, or should we start from the other end, by “internationalising” already existing theories of domestic policy implementation?

Figure 8.1 below suggests a model for understanding environmental technology co-operation capacity (ETCC).<sup>289</sup> By *environmental technology co-operation capacity* is meant the ability to implement programmes and/or projects aimed at utilising new environmental technology

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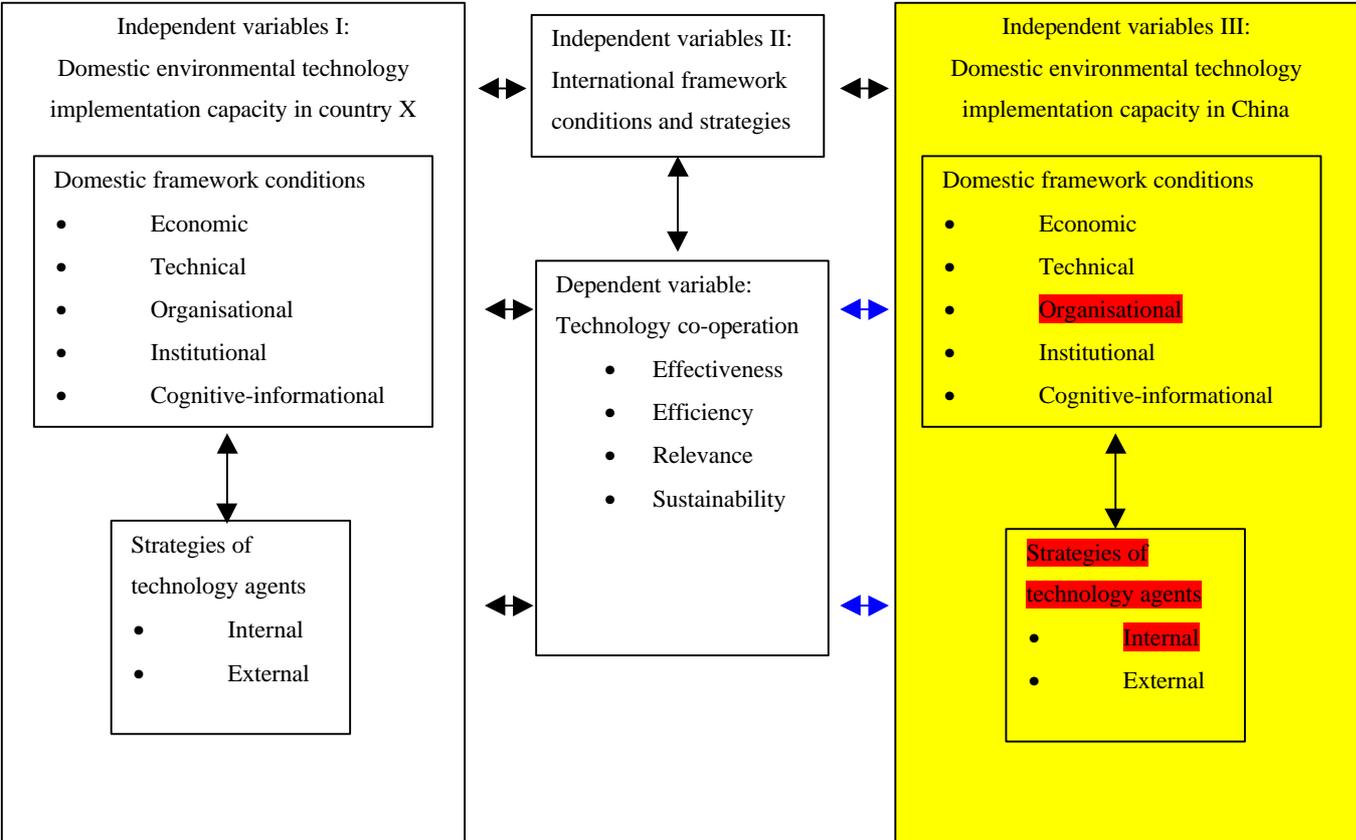
<sup>288</sup> This discussion is indirectly informed by Mathiassen (forthcoming).

<sup>289</sup> The scope of this thesis is marked yellow, and the independent variables studied are marked red.

stemming from technology co-operation between two countries.<sup>290</sup> As illustrated in the model, such capacity is a common denominator for international as well as domestic framework conditions (in both countries taking part in the technology co-operation), and strategies of relevant actors resulting from these framework conditions.<sup>291</sup> The suggested dependent variable is technology co-operation, which can be successful or less so. However, ETCC is also constituted by the influence that actors' strategies in turn have on framework conditions. If this element were not included, the ETCC concept would have static, not dynamic, and thus unsuitable for the study of socio-political processes.

The ETCC concept is very general. It therefore needs to be “operationalised” in order to constitute a valuable tool for the analysis of a particular socio-technical system. This is done by defining specific framework conditions and strategies – independent variables – relevant for the socio-technical system of study, and generating hypotheses about how they influence implementation.

**Figure 8.1 Preliminary model of international environmental technology co-operation**



<sup>290</sup> However, the term may just as well be used in a situation of technology co-operation within a country (be it in the North or in the South).  
<sup>291</sup> As should be obvious in a chapter arguing for research on linkages between international and domestic aspects of the implementation of environmental commitments, the distinction between international and national framework condition is made strictly for analytic purposes. As has been pointed out e.g. by Hanf and Underdal (1998) and Putnam 1988), the distinctions are much more vague in reality.

### 8.2.3 Closing remarks

In the methodological chapter, a number of reasons why this project was chosen were mentioned. However, there was one more: while the Norwegian business and government representatives have regarded the Yantai project as a failure, the Chinese do not. What can we learn from this?

First, different actors participating in international technology co-operation might define implementation success very differently. This should serve as a reminder to consultants, business representatives and development aid bureaucracies in the North that success should primarily be measured according to whether project or programme objectives have been fulfilled, and whether the problem motivating the programme or project is actually being solved. Both the problem and the objectives against which to measure successful implementation should be firmly anchored in the host country, and relevant localities in that country.

Second, there is no such thing as an objective “core” of a technology co-operation project. Technology – and thereby project implementation success – has more dimensions to it than merely the technical, and these dimensions may take on different forms in different contexts. Technology is more than nuts and bolts.

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Where documents from web sites have been used, the last date the when web site and/or the document was used is included in brackets.

C = In Chinese.

D = In Danish.

N = In Norwegian.

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Gong, Dafei and Feng Yu (eds.) (1998), *Chinese Maxims – Golden Sayings of Chinese Thinkers*, Singapore: Asiapac, Southeast Asia edition.

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*WordNet 1.6 – A Lexical Database for the English Language*, URL: <http://www.cogsci.princeton.edu/cgi-bin/webwn> (25 July 2000).

## 9.12 Web sites, newsletters and journals

Some web sites, newsletters and journals that have been especially valuable during the thesis work:

Administrative Centre for China's Agenda 21, URL: <http://www.acca21.edu.cn> (includes *China's Agenda 21 Update*).

Centre for Environmentally Sound Technology Transfer, Administrative Centre for China's Agenda 21, URL: <http://www.cestt.org.cn/acca21> (includes *CESTT Newsletter* and *CESTT Policy Digest*).

*China Business Review*, The United States-China Business Council, URLs: <http://www.uschina.org/>, <http://chinabusinessreview.com>.

China Council for International Co-operation on Environment and Development, URL: <http://www.harbour.sfu.ca/dlam> (includes *CCICED Newsletter*).

*China Daily*, URL: <http://www.chinadaily.com.cn> (includes *China Daily Business Review*).

*Chinaenvironment.com*, URL: <http://www.chinaenvironment.com>.

*China Information*, URL: <http://www.let.leidenuniv.nl/tcc/journal/introduction.htm>.

*China Journal*, URL: <http://rspas.anu.edu.au/ccc/journal.htm>.

*China News Digest*, URL: <http://www.cnd.org>.

*ChinaOnline*, URL: <http://www.chinaonline.com>.

*China Quarterly*, URL: <http://www.oup.co.uk/chinaq/contents/>.

*Earth Negotiations Bulletin*, URL: <http://www.iisd.ca/linkages/voltoc.html>.

Environment Resources Management China, URL: <http://www.ermchina.com> (includes *The China Environment, Health and Safety Review*).

*Far Eastern Economic Review*, URL: <http://www.feer.com>.

*Inside China Today*, URL: <http://www.insidechina.com/>.

Institute of Environment and Development, URL: <http://www.ied.org.cn/Environment/index.html>.

International Fund for China's Environment, URL: <http://www.ifce.org>.

*Issues and Studies*, URL: <http://iir.nccu.edu.tw/english/period.htm>.

*Journal of Contemporary China*, URL: <http://www.tandf.co.uk/journals/carfax/10670564.html>.

Professional Association for China's Environment (PACE), URL: <http://www.chinaenvironment.net> (includes *China Environment Reporter* and *Sinosphere*).

State Environmental Protection Administration, "Environmental Protection", URL: <http://www.sepaic.gov.cn>.

*South China Morning Post*, URL: <http://www.scmp.com/>.

UN Commission for Sustainable Development, URL: <http://www.csd.org>.

U.S. Embassy in China, URL: <http://www.usembassy-china.org.cn/english/sandt/index.html> (includes *Beijing Environment, Science and Technology Update*).

The World Bank - New Ideas in Pollution Regulation, URL: <http://www.worldbank.org/NIPR> (includes *NIPR Newsletter*).

*World Environment News*, Reuter's, URL: <http://www.planetark.org>.

## 10 Appendices

### 10.1 Interview guide

Only the most central questions related to the fieldwork in Hong Kong and Mainland China are quoted below. Many of these questions have also been asked during interviews with Norwegian interviewees; however, as mentioned above, the latter were of a more exploratory character.

#### 10.1.1 General questions

- To what extent have law, regulations, plans, programmes, and institutional changes in governmental agencies been intentional efforts to implement the objectives of China's Agenda 21?
- How well does the Priority Programme reflect the objectives set in the White Paper? Give an account of your point of view.
- To what extent have the White Paper objectives and the priorities found in the 1994 Priority Programme for CA21 been reflected in the 9<sup>th</sup> Five Year Plan (1996-2000)?
- How many projects under the 1994 and 1996 Priority Programmes, respectively, have been implemented or are in the process of being implemented at this stage? What are the main reasons for this result (success/failure)? If there is a difference between 1994 and 1996, why?
- What differences (if any) are there between the general approach and the specific project portfolio of the 1996 and the 1994 Priority Programmes, respectively? If changes were made, why?
- Norwegian business and government have been involved in five CA21 projects, four of which do not seem to be implemented, and one that is implemented without Norwegian assistance. Are these results due to any special characteristics of the Norwegian representatives or their way of negotiating or doing business, or are other factors more important?
- How did the fact that many actors took part in the formulation of China's Agenda 21 at the national level, influence the implementation of each particular project?
- Would you say that the position of CA21 has been strengthened, weakened or has stayed the same since the process was started in 1994? Give an account for you point of view.

## 10.1.2 Questions related to independent variables

### Horizontal fragmentation

- Which actors were interested in organising China's Agenda 21, and why? To what extent did these actors make use of specific strategies to reach this objective?
- Does the CA21 White Paper – and the CA21 Priority Programmes – reflect the interests of specific organisations? If so, in what ways?
- How is the relationship between [ORGANISATION] and the other actors involved in CA21 – co-operation or conflict, or both but at different dimensions/issues?
- ACCA21 is intended to be a “CA21 clearinghouse”, independent of bureaucratic interests. To what extent has ACCA21 been successful in playing such a role so far? Give an account for your point of view. What are the pros and cons of not being affiliated to an established organisation in China?
- To what extent is ACCA21 competing with other ministries, departments, bureaux or research institutes for the attention of central decision-makers? Which?
- Could any other ministry, department, bureau or research institute have performed the function that ACCA21 and CESTT have today? If so, why was ACCA21 established?
- To what extent (if any) did ACCA21 or other agencies take initiatives to co-ordinate the different actors involved in marine oil pollution concerning the implementation of the Yantai project?
- To what extent do you believe that the structure of the Chinese bureaucracy is appropriate for meeting such broad and cross-cutting issues as those raised by CA21? Give an account for your point of view.
- How did the economic development and industrial ministries respond to the CA21 initiative, and how active have they been in the formulation and implementation process so far?
- To what extent (if at all) have agents responsible for project implementation taken the opportunity to shape the projects according to their own interest in the implementation phase?
- SOA has published the “Ocean Agenda 21” as a follow-up of China's Agenda 21? What has MOC done to follow-up CA21, and to what extent has MOC been involved in the work with the Ocean Agenda 21?
- Many observers – Chinese and Non-Chinese – have described environmental policy formulation and implementation in China as fragmented. How well do you think that this expression fits the implementation of China's Agenda 21, and the Yantai project in particular?

- The CA21 Leading Group consists of a relatively large number of organisations at different bureaucratic levels working with a broad range of issues relating to environment and development in China. In what way (if any) has this influenced the Leading Group's ability to co-ordinate China's Agenda 21 work? What have been the main challenges in co-ordination?
- Some researchers from countries in the North have stated that the then SSTC and SPC excluded SEPA from the Agenda 21 process. Is this correct? If so, why did this happen, and what consequences does this have for the co-ordination and implementation of CA21?
- Which chapter(s) (if any) of CA21 would you describe as being directly focusing on – or related to – oil spill contingency planning? Which actors took part in the formulation of these chapters, and to what extent was their work co-ordinated? Give an account for your point of view, and/or examples to illustrate it.
- Has CA21 contributed to clarifying the roles and jurisdictions (according to law, and in practice) of SOA, SEPA, and MOC in marine oil pollution (if so: in what way)?, or has the situation become more unclear?
- Why was MOC awarded the responsibility for the Yantai project, and not SOA, or SEPA?

### **Vertical fragmentation**

- Both economic and environmental policy implementation in China have been decentralised the last few years. How has this influenced implementation of CA21, and the Yantai project in particular?
- Explain how the Yantai project became included in the CA21 1994 Priority Programme. Did the proposal come from Yantai or MOC centrally? Which was most involved in the application process, Yantai or MOC centrally?
- How did the selection of 500 projects for screening take place, and how were the first 62 pilot projects selected from these 500? If end-users and localities have been competing for projects under CA21, what strategies (if any) have been employed, and which of these has proved most successful?
- The Ministry of Communications has developed an oil contingency plan for the whole coastline. Does this mean that other project sites were possible? If so, why was Yantai chosen, given the fact that it is neither the most important nor the largest harbour nor the harbour having most trouble with oil spillage? Why was the project moved from Qingdao to Yantai?
- Since 1994 a number of local Agenda 21 offices have been established. Under which central level agency's authority are they? To what extent are they subject to the influence of the local administrative authorities? Is their source of financing local or central?

- To what extent can ACCA21 influence the bureaucracies responsible for implementation of the priority projects?
- Yantai:
  - What benefits will the project bring to Yantai?
  - How would you describe the relationship between Yantai and the local government (e.g. the Mayor's office)? In what way – if any – are these relations influenced by the fact that Yantai Maritime Safety Superintendent Bureau is ranked directly below MOC?
  - The Norwegians say that you have always been very friendly, but that the people in MOC have not been so easy to co-operate with. Why do you think they have that opinion?
- MOC:
  - Which departments in MOC were involved in the project? How – if at all – did the fact that different MOC departments took part in the project affect MOC's approach to the project?

### **Relative organisational strength**

- What role has your own organisation played in the process of formulating – and implementing CA21?
- Which actors are central in implementation of environmental technology policy in China? How do you perceive the relative organisational strength of these actors, in terms of
  - Personnel?
  - Competence?
  - Financial resources/revenue?
  - National and international linkages?
  - Other factors (if you want to use drawings to illustrate the relationship between the actors, please do)?
- Using the same indicators, how would you judge the relative strength of the environmental technology policy actors compared to that of central bureaucratic actors in the field of economic development?
- How did the 1998 government restructuring process influence the relative strengths of the relevant organisations according to the indicators above, and what impact – if any – did this have on the further implementation and follow-up of CA21 and the Yantai project in particular?

- To what extent (if any) has the relative strength of the organisations central in formulating and implementing CA21 influenced the implementation status of the Yantai project?

### 10.1.3 Questions related to strategies

#### **Individual-cum-organisational relation building**

- What do you understand by the term *guanxi*?
- Which persons – be it in the top leadership or in other parts of the CA21 bureaucracy – were driving forces in the formulation of the CA21 White Paper and the Priority Programme(s)? In what ways, and why? Who were the laggards?
- What do you perceive as the most important criteria for selection of CA21 priority projects? To what extent – if any at all – do you think personal relations (e.g. between key decision makers and ministry officials, between ministry officials and local representatives etc.) played a role in this regard?
- How would you characterise the personal relations between the leaders of your organisation and [SEPA, MOST, ACCA21, MOC, SOA, MOFTEC, YMSSB, depending on interviewee's workplace]?
- To what extent – if any – has the active use of personal relations been important in the implementation of the Yantai project? If so, why, by which actors, and how?
- How have you got hold of the information necessary to implement the project?
- Which organisations must have a good relationship in order for the Yantai project to be successfully implemented?
- Which persons on the Chinese side have been important in the implementation of the project?
- Yantai:
  - How did you keep updated about the development of the project negotiations centrally?
  - How much contact with local MOFTEC branch in preparing the project? Provincial Planning Commission? Local bank? Bank of Construction?

## **Tactical translations of technology**

- What do you understand by “technology”?
- What kind technology was to be used in the Yantai project, by whom, where, and for what purposes?
- To what extent do the actors involved in the Yantai project share this conception of the project? If some actors do not: how do their interpretation differ, and why?
- MOC now builds an oil spill contingency centre in Yantai for its own money. Does MOC have clear plans for replication of this pilot project? If so, where, and with what kind of financing?

## **10.2 List of interviewees**

E: E-mail interview

P: Personal interview

T: Telephone interview

### **10.2.1 Preparatory interviews in Norway and Denmark**

#### **Business and industry**

PNBI1: Stein Erik Sørstrøm, Green Development Network/SINTEF, October 1998, September 1999 (P).

PNBI2: Stein Hansen, Nordic Consulting Group, 16 December 1998 (P).

PNBI3: Einar Matheson, Goodtech AMI Industries, 4 January 1999 (P).

PNBI4: Ragnvald Matheson, Goodtech AMI Industries, 4 January 1999 (P).

PNBI5: Anonymous, ECON Centre for Economic Analysis, 4 January 1999 (T).

PNBI6: Roald Wie, Frank Mohn Flatøy, 19 January 1999 (P), 25 May 1999 (T), 27 May 1999 (T).

PNBI7: Jon Alsaker, Atlas Stord, 1 February 1999 (T).

PNBI8: Erik Sørbye, formerly Kværner Water Systems, currently Kværner Field Development, 25 May 1999 (T), 21 December 1999 (E).

PNBI9: Tore Johnsen, NORPLAN, 27 May 1999 (T).

PNBI10: K. Harald Drager, Quasar Consultants, 27 May 1999 (T).

## **Government and administration**

PNG1: Bjørn Bergmann-Paulsen, Norwegian Pollution Control Authority (SFT), formerly Norwegian Trade Council, 10 May 1999 (T).

PNG2: Trond Jensen, NORAD, 12 May 1999 (T).

PNG3: Tori Tveit, NORAD, 18 May 99 (T).

PNG4: Anonymous, World Bank, 19 May 1999 (T).

PNG5: Jan Tore Holvik, former Norwegian Ambassador to China, currently Department of Planning, Ministry of Foreign Affairs, 16 May 1999 (T).

PNG6: Grete Ottesen Aase, Norwegian Trade Council, 20 May 1999 (T).

PNG7: Marit Brandtzæg, NORAD (T), 11 May 1999.

PNG8: Leiv Lunde, Secretary of State, Norwegian Ministry of Foreign Affairs, 11 May 1999.

PNG9: Jan Dag Andersen, NORAD, 11 May 1999.

PNG10: Norman Weisz, formerly Norwegian Trade Council, 27 March 2000 (T).

## **Research**

PNR1: Øystein Thommessen and Stian Reklev, the Fridtjof Nansen Institute, 12 December 1998 (P).

PNR2: Valter Angell, Norwegian Institute of International Affairs (NUPI), 27 March 1999 (P).

PNR3: Verner Worm, Department of International Economics and Management, Copenhagen Business School, 12 April 1999 (P).

PNR4: Finn Medbø, Norwegian Institute for Water Research (NIVA), 20 May 1999 (T).

### **10.2.2 Preparatory interviews in Hong Kong**

## **Research**

PHKR1: Carlos Wing-Hung Lo, Associate Professor, Department of Management, the Hong Kong Polytechnic University 11 June 1999 (P).

PHKR2: K.C. Cheung, Associate Professor, Department of Management, the Hong Kong Polytechnic University, 11 June 1999 (P).

PHKR3: Professor Peter Hills, the Centre of Urban Planning and Environmental Management, the University of Hong Kong, 14 June 1999 (P).

PHKR4: Kenneth Wong Koon Kwai, Associate Professor, Department of Geography, Faculty of Social Sciences, Hong Kong Baptist University, 15 June 1999 (P).

PHKR5: Dr. Lin Feng, Assistant Professor, School of Law, City University of Hong Kong, 15 June 1999 (P).

### **Non-governmental organisations**

PHKN1: Plato K. T. Yip, Assistant Director, Friends of the Earth, Hong Kong, 14 June 1999 (P).

### 10.2.3 Interviews in Mainland China<sup>293</sup>

### **Non-governmental and government-organised environmental organisations**

N1: Lailai Li, National Program Director, Institute for Environment and Development, 25 June 1999 (P).

N2: Su Fan, Engineer, China Association of Environmental Protection Industry, 30 June 1999 (P).

N3: Jia Feng, Deputy Director, Centre for Environmental Education and Communications, SEPA, 30 June 1999 (P).

N4: Li Hanying, Project Manager, China Environmental Protection Foundation, 30 June 1999 (P).

N5: Anonymous, 2 July 1999 (P).

N6: Professor Liang Congjie, President, Friends of Nature, 7 July 1999 (P).

N7: Barbara Finamore, Senior Attorney, Director, China Clean Energy Project, Natural Resources Defense Council, 31 August 1999 (P).

### **Research**

R1: Liu Jian, Associate Professor, Director, Division of Agriculture, Ecology, Environment and Science Education, Bureau of Science and Technology for Resources and Environment, Chinese Academy of Sciences, 26 April 1999, 22 June 1999, and 12 July 1999 (P).

R2: Zhou Fengqi, Director, Energy Research Institute, the State Development Planning Commission, and Professor, the Chinese Academy of Sciences, 21 June 1999 (P).

R3: Zhang Shiqiu, Associate Professor, Peking University, 24 June 1999 (P).

R4: Professor Ding Yuanzhu, Director, the Centre for Planning and Research, Institute of Social Development, SDPC, 1 July 1999 (P).

R5: Two anonymous respondents, Chinese Academy of Social Sciences, 1 July 1999 (P).

## **Business and industry**

BI1: Zhu Rong-fa, interpreter, 17 June 1999 (P).

BI2: Kjell Rogstad, Vice President, Kværner Energy a.s, (Beijing and Hangfa Representative Offices), P.R. of China, 21 June 1999 (P).

BI3: Song Delin, Deputy Representative, Beijing Representative Office, Goodtech Industries, 22 June 1999 and 7 July 1999 (P).

BI4: John O. Hjelset, Chief Representative, Den norske Bank, Beijing Representative Office, 24 June 1999 (P).

BI5: Jim Stover, Consultant/Regulatory Specialist, Environmental Resources Management (ERM) China, 25 June 1999 (P).

BI6: Rowland Zhang, General Manager, Moudao Environmental Technology Co. Ltd. (formerly employed at ERM China), 28 June 1999 (P).

In addition, Kjell Stenstadvold, Chief Representative, Norsk Hydro, Beijing Representative Office was consulted on a more informal basis.

## **Government**

G1: David Cowhig, Second Secretary, Environment Science and Technology, U.S. Embassy, Beijing, China, 17 June 1999 (P).

G2: Shi Han, Director, Centre for Environmentally Sound Technology Transfer, ACCA21, 22 June 1999 and 6 July 1999 (P).

G3: Gunnar Mathisen, Special Advisor, Norwegian Ministry of Environment, former Environmental Councillor, Norwegian Embassy, Beijing, 5 August 1998, 25 June 1999 and 4 July 1999 (P).

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<sup>293</sup> The categorisation may be somewhat misleading, as the distinctions between NGOs, research organisations the state apparatus and business are far less clear-cut in China than is the case in the Western world, but it should nevertheless give an impression of the occupational distribution of the persons interviewed in China.

- G4: Anonymous, Ministry of Foreign Trade and Economic Co-operation (MOFTEC), 28 June 1999 (P).
- G5: Zhong Xiaodong, Senior Programme Officer, Department of International Co-operation, SEPA, 29 June 1999 (P).
- G6: He Jin, Assistant Resident Representative, UNDP, Beijing, 29 June 1999 (P).
- G7: Lu Lei, Programme Officer, Programme Support Unit, UNDP, Beijing, 29 June 1999 (P).
- G8: Li Gao, Programme Officer, Centre for Environmentally Sound Technology Transfer, ACCA21, MOST/SDPC, 2 July 1999 (P).
- G9: Huang Jing, Associate Professor, Deputy Director, Strategy and Research Division, ACCA21, MOST/SDPC, 2 July 1999 (P).
- G10: Anonymous, Ministry of Finance, the People's Republic of China, 5 July 1999 (P).
- G11: Liu Zhiquan, Deputy Director, Division of Environmental Technology Policy and Environmental Industry Development, SEPA, 6 July 1999 (P).
- G12: Liu Xin, Foreign Capital Utilisation Office, Planning Department, Ministry of Communications, P.R. of China, and Zeng Hui, Director, Department of Planning, Maritime Safety Administration, P.R. of China, 8 July 1999 (P).
- G13: Wang Shu Mei, Senior Engineer (and project responsible), Office for the Model Project of Oil Spill Prevention from Ships, Yantai Maritime Safety Superintendent Bureau, 9 July 1999 Ministry of Communications (P).
- G14: Ye Meng Jie, Section Chief, Section on Science and Technology, monitoring and International Co-operation, Yantai Environmental Protection Bureau, 9 July 1999 (P).

### **10.3 China's sustainable development challenges and its follow-up of Agenda 21 – a short overview**

This appendix introduces the reader to China's formidable sustainable development challenges and its efforts to tackle them through China's Agenda 21, as a background to the empirical and analysis chapters. China has launched other comprehensive environmental programmes as well (see e.g. NEPA's Trans-Century Green Plan (1997)).<sup>294</sup> However, they will not be elaborated on below, as this thesis focuses on China's Agenda 21 rather than China's sustainable development policy in general.

#### 10.3.1 China's sustainable development challenges

##### **Economic growth, energy, the environment and social stability**

Recently, 3,000 urban Chinese in ten cities were asked what their top concern was. Environmental degradation and protection was ranked number one. Taking into account that China is undergoing a very painful transition from a socialist to a market economy, it is indeed remarkable that unemployment, social stability, crime, corruption, economic growth and social security for the aged were among those issues ranked as being of less concern.<sup>295</sup>

China is perhaps the country in the world most clearly experiencing the challenges of sustainable development.<sup>296</sup> To reach their primary goal of social stability, China's leaders depend on economic growth, as their ideological legitimacy has been weakened by the economic reforms started in 1978. China's economic structure has been changing very rapidly the last 20 years or so, bringing China from a position of a low-income country to one of a middle-income country. The areas along the eastern coast have been the locomotives of growth, but industrialisation and urbanisation is accelerating in rural areas as well. Between

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<sup>294</sup> This plan is sometimes called the Trans-Century Green Plan, and sometimes the Trans-Century Green Project Plan. Here, the former title will be used.

<sup>295</sup> This list is published as part of the 2000 version of a survey made by Lingdian (Horizon) Research, titled "The Most Important Social Issues for the Chinese Public", cited in *Beijing Environment, Science and Technology Update* 3 November 2000, and *China Online* ("Survey says environmental protection hottest social issue", 7 November 2000).

1979 and 1998, China's economy has grown by an annual average of 9 percent, peaking at 13.4 percent in 1993 (it is worth noting that this average number conceals large differences in growth modes between coastal and inland areas). So far this year it seems that Chinese authorities will reach their goal of 8 percent economic growth. An annual growth of 5 to 7 percent is planned in the coming 20 years.

Economic growth, in turn, partly depends on energy provision. However, fuelling China's development is itself a threat to the social stability it is to guarantee. Energy production results in environmental degradation, which in turn produces social unrest and serious damages to the economy. The development of the Three Gorges dam and the associated resettlement programme is the most prominent example; the social unrest in the wake of the streamlining of China's coal sector is another.<sup>297</sup>

China's long-term strategy for balancing energy development with environmental protection thus assumes extraordinary importance both for the country itself and the rest of the world (Edmonds 1994, Smil 1988, 1990, Gan L. 1998, Buen 1998b). Being the most populous country, the number one coal producer and consumer, as well as the second largest emitter of greenhouse gases (GHGs) in the world, China's current and future energy–environmental policy may contribute to long–term world-wide sustainable development, *or* reverse any global initiative in the realm of energy and environment.<sup>298</sup>

### **Natural resources and their distribution**

China has less than the world average of a number of important natural resources (see Table 10.1 below), and many of these resources are unfavourably distributed and exploited in a very energy-intensive manner. Two-thirds of China's land areas are mountainous areas. Moreover, about 64% of China's agricultural areas are located in the northern parts of China, where only 17% of China's water resources are to be found. The Eastern parts of China have set the pace in industrial development, and consequently these areas consume more energy than do other areas in China. However, current energy production (mainly coal thermal power, and some

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<sup>296</sup> Some of the paragraphs in this section have been adapted from Buen (1998b).

<sup>297</sup> See e.g. "China Admits Unrest Being Fuelled By Millions Made Jobless", *Inside China Today*, 7 March 2000, URL: <http://www.insidechina.com/news.php3?id=140930> (27 July 2000).

<sup>298</sup> It should be mentioned that a number of important steps have been taken to increase energy efficiency; one of the results being that China's coal use declined by 10 percent between 1996 and 1999 (Logan 2000). Furthermore, several initiatives to introduce new and renewable energy sources in China have been taken in recent years.

hydropower) as well as potential energy resources (wind and solar energy, biomass, geothermal energy) are to be found in China's interior – especially the far West and Northwest. Lack of water makes it difficult to wash the coal prior to transportation – perhaps the most efficient way to improve coal transport. Coal transportation thus represented 43 per cent of all railway freight traffic in 1993 (National Response Strategy 1993), and an even higher percentage of riverboat traffic.

**Table 10.1 China's natural resources**

<b>China's natural resources</b>		
<i>Type of resources: examples</i>	<i>No. in the world</i>	<i>Approx. proportion of average per capita of resource in the world</i>
<b>Natural resources overall</b>	4	
<b>Hydropower</b>	1	2/5*
<b>Solar energy</b>	2	2/5*
<b>Coal</b>	3	2/5*
<b>Oil</b>	8	2/5*
<b>Minerals</b>	3	1/2
<b>Grasslands</b>	4	1/2
<b>Farmland</b>	4	1/3
<b>Forest</b>	6	1/6

\* This number reflects China's energy consumption per capita compared to average energy consumption per capita in the World, and does not refer to the proportion consumed of specific energy sources.

Source: Liu Jian (1994)

### **Population growth and food security**

Despite an effective "one-child" birth-control policy, China's population is steadily increasing, a problem aggravated by the lack of resources illustrated above. China's population officially is 1.25 billion, although the real figure is believed to be tens of millions higher. Chinese authorities hope to limit the country's population to 1.4 billion people in

2010. According to some experts, China's population will peak at about 1.6 billion in the mid-21st century even though birth control is intensified.<sup>299</sup>

In the article "Who will feed China?", Lester Brown (1994) warns that China will have great difficulty feeding its own population in the coming decades. Consequently, he predicts, Chinese grain imports will send shock vibrations into the world grain market. Many agricultural experts in China and elsewhere have questioned Brown's views.<sup>300</sup> However, the report "Science and Education for A Prosperous China", published by SSTC (1996) for a target group of Chinese Communist Party and government officials, goes a long way in accepting Brown's views on China's future food security challenges. It states that China's agricultural production must increase by 20-40 percent in order to meet the steadily increasing demand of a population of 1.3-1.6 billion. The only way this can happen, according to the report, is unit productivity increases, as net arable land decreases every year while population rises. Soil erosion, grassland deterioration, desertification and pollution of farmland are also parts of the problem, as is the need to create jobs for the increasing number of surplus workers in China's countryside.

### **Water and air pollution**

Water and air pollution in China is getting increasingly serious. China's per capita water resources are only 25 percent of the world average, and unevenly distributed. Access to clean drinking water is threatening China's further economic and social development. Ground water levels in China's north are steadily reduced (in Beijing by 1,5-2 meters a year). About half of these groundwater sources are very polluted – as are about 80 percent of China's rivers and lakes – mainly because of the 100 million tons of wastewater discharged by industry every day. Old plans for diverting enormous amounts of water from the Yangtze delta to the north, through the building of a canal of Great Wall proportions, are now being seriously considered.

The Chinese government, otherwise reluctant to admit mistakes, has declared pollution to be causing a national crisis.<sup>301</sup> The main reasons for the excessive air pollution in China is that coal with high sulphur content is consumed directly by industry for steam generation and by

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<sup>299</sup> See e.g. "Birth-control laws to be 'perfected'", *South China Morning Post*, 7 May 2000.

<sup>300</sup> Three examples are State Council Information Office (1996), U.S. Embassy Beijing (1996), Alexandratos (1997) and Heilig (1997).

households for cooking and heating through inefficient combustion technologies. In more than 500 Chinese cities, air quality is below the standards of World Health Organisation (WHO). In many of these cities, levels of particles and sulphur dioxide (SO<sub>2</sub>), the main sources of air pollution, are two to five times that of WHO standards. Five Chinese cities are among the world's ten most polluted.<sup>302</sup> Many Chinese cities have started publishing weekly pollution indices,<sup>303</sup> and Beijing is working hard to improve its air quality in order to get the 2008 Olympic Games.<sup>304</sup>

Partly because of air pollution, chronic obstructive pulmonary disease – emphysema and chronic bronchitis – has become the leading cause of death in China (Lunde *et al.* 1995, World Bank 1997). The World Bank has recently estimated that air pollution causes 178,000 premature deaths a year in major cities. The Bank estimates pollution-related damages to be 54 billion USD annually – or nearly 8 per cent of China's gross domestic product (GDP) in 1995.<sup>305</sup> Smil (1997) suggests that the number is closer to 15 per cent. The rapidly growing number of motorised vehicles on Chinese roads (in Beijing only, the number of vehicles increase by 100,000 annually), deepen the problem of air pollution even further.

The rapidly growing so-called Town and Village Industrial Enterprises (TVIEs) are increasingly important in Chinese leaders' search for economic growth and social stability. Employing about 120 million people and accounting for more than 30 per cent of China's gross national product (GNP) in 1994, they have increased the rural populations' standard of living, and reduced rural-urban migration. Air pollution from TVIEs has been increasing rapidly, however. High compliance costs prevent many small TVIEs from implementing environmental policies. Both production and abatement technologies are outdated, poorly maintained and inefficient. About 65,000 enterprises were reportedly closed down in 1997 due to violations of environmental laws; however, the effectiveness of such a strategy is unclear, as it requires difficult trade-offs between environmental and social goals. For example, SEPA recently felt the need to issue an "Urgent Order Prohibiting the Transfer of Polluting Industries to Western China".<sup>306</sup>

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<sup>301</sup> "Severe Air Pollution a Way of Life in Beijing", *China Environment Reporter*, Vol. 1, No. 2, 30 May 1997.

<sup>302</sup> "Chinese Air Pollution Tops Charts", *China Environment Reporter*, 1997, Vol. 1, No. 1, 30 April 1997.

<sup>303</sup> "Beijing Launches Clean-Up Campaign to Clear Smog", *World Environment News*, 19 April 1998.

<sup>304</sup> See e.g. "Gray area: Beijing tightens air pollution controls, enacts skyline colour scheme", URL: <http://www.chinaonline.com/industry/environmental/currentnews/secure/c00103006.asp>, and "Beijing's crackdown on air pollution continues", URL: <http://www.chinaonline.com/topstories/001107/1/B200110624.asp> (both 20 January 2000).

<sup>305</sup> Both air and water pollution.

<sup>306</sup> Beijing Environment, Science and Technology Update, 3 November 2000.

### 10.3.2 China's Agenda 21 (CA21)

This study focuses on one particular project included in CA21. However, a short overview of how CA21 has been formulated and implemented is appropriate, as the organisational context of Project 6-8 plays a major role in the analysis of the factors influencing its implementation status (see Ch. 6).

Not long after the United Nations Conference on Environment and Development (UNCED) in 1992, the Chinese government put forward ten policies for promoting environmental protection and development in China. One of these measures was the preparation of a national Agenda 21. One of the motives for the rapid Chinese follow-up of the Rio Conference may have been that A21 was regarded as a means to channel more funds and technology to China. China may also have regarded CA21 as a means to increase its standing in the international community in general, and consolidate its leading position in the South in international politics, through being active in the field of environment and development.

At the 23<sup>rd</sup> session of the (now abolished) State Environmental Protection Committee (SEPC) of the State Council, 2 July 1992, it was decided to establish a leading group for China's Agenda 21. This leading group was to be co-chaired by deputy ministers of two of China's most powerful supra-ministerial organs, namely SPC and SSTC, and with deputy leaders from State Economic and Trade Commission (SETC) and NEPA. The terms of reference for the leading group were to organise and guide the formulation and implementation of the "White Paper on China's Population, Environment, and Development in the 21<sup>st</sup> Century" ("China's Agenda 21", or CA21) and its associated Priority Programmes, with assistance from the UNDP.<sup>307</sup> Working groups composed of more than 300 experts from 52 commissions, ministries, agencies, and government-organised non-governmental organisations (GONGOs) was established (ACCA21 1997b). The Administrative Centre for China's Agenda 21 (ACCA21) was established in March 1993, and entrusted the responsibility for routine administration of CA21.<sup>308</sup>

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<sup>307</sup> Apart from assisting the CA21 Leading Group in formulating CA21, the first phase of UNDP's so-called Capacity 21 project included training and advice. The second phase concentrated on integrating CA21 into long term plans, while the third phase aimed to help China implement Agenda in provinces and localities.

<sup>308</sup> See Section 5.3 for more information on ACCA21's areas of responsibility.

The first draft of China's Agenda 21, totalling 120,000 Chinese characters and 40 chapters, was completed in May 1993. It suggested 80 programme areas for sustainable development strategies and policies related to population, economy, society, resources, and the environment in China. A second draft was ready in August 1993. After a third review by international consultants financed by the UNDP, a final draft was subject to comments and suggested changes from appropriate ministries and agencies of the State Council as well as domestic and international experts, at a UNDP-sponsored international workshop 25-29 October 1993. The final version of China's Agenda 21, approved at the 16<sup>th</sup> Executive Meeting of the State Council 25 March 1994, had the following four overarching objectives (ACCA21 1997b):

- maintain rapid economic development, but increase the quality of development through scientific and technological advancements;
- establish a social basis for sustainable development;
- control pollution and use promote rational use of natural resources; and
- introduce legislation necessary for promoting overall co-ordination of decision-making for sustainable development.

According to the China's national report to the UN Commission on Sustainable Development before the Earth Summit +5 in 1997 (ACCA21 1997b), the following four dimensions of the implementation of CA21 have been emphasised:

- economic structure adjustment;
- gradual integration of CA21 into national economic and social development plans;
- capacity building for sustainable development; and
- promotion of international co-operation.

CA21 consisted of 20 chapters divided into four major sections: (i) overall strategies for sustainable development; (ii) sustainable social development; (iii) sustainable economic development, and (iv) rational utilisation and protection of resources and the environment.

CA21 is divided into nine priority areas.<sup>309</sup> Each chapter has been organised into two sections, namely (i) introduction and (ii) programme areas (78 in all). The introduction aims to clarify the objectives and significance of each programme area and the role each of these plays in overall sustainable development. Each particular programme area is then divided into three subsections: basis for action and key problems in the first, objectives in the second, and proposed activities for implementation in the last.

China's Agenda 21 was presented to the international community through "The High-Level Round Table Conference on China's Agenda 21" in Beijing 7-9 July 1994, together with "The Priority Programme for China's Agenda 21: First Tranche" (SPC/SSTC 1994b). The conference defended its title, mostly thanks to intensive lobbying in several countries in the North beforehand. In the plenary session, the World Bank, the Asian Development Bank (ADB), 15 foreign governments, 8 companies and international NGOs pledged their support for 50 of the 62 projects included in the 1994 Priority Programme (PPCA21 1994).<sup>310</sup> These projects were to be integrated in the 9<sup>th</sup> Five-Year Plan (1996-2000), and the long-term plans to 2010, according to an agreement signed by SPC, SSTC and UNDP in July 1994. This agreement also included a two-year research and training programme.

The priority projects were selected after a screening of more than 500 project proposals that had been forwarded by actors at all levels in the political system (although perhaps mainly from the central level). For a project to be selected, it should be so important for China's sustainable development strategy that it had to be completed quickly. It should also promote economic and social development; strengthen China's capacity to solve similar problems in the future; contribute to the mitigation of global environmental problems; be integrated with sectoral and local government planning; and be a demonstration project (Shen 1995: 72-73). Sixty percent of the funding for the first priority projects – tentatively estimated to be about 4.3 billion USD at that time (Gan S. 1995: 75) – was to be provided by China, and the remaining forty percent by the international community.

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<sup>309</sup> "Capacity building for sustainable development"; "Sustainable agriculture"; "Cleaner production and environmental protection industry"; "Clean energy and transportation"; "Conservation and sustainable utilisation of natural resources"; "Environmental pollution control"; "Combating poverty and regional development"; "Population, health and human settlements"; and "Global change and biodiversity conservation", respectively.

<sup>310</sup> See footnote 315 below.

A directive simultaneously issued by the State Council also stipulated that China's Agenda 21 should be an "overarching strategic guideline" for other economic and social development plans – and implemented in day-to-day management – at both national and sub-national (municipal/provincial) levels (ACCA21 1995a). The directive also called for the promotion of public awareness so that decision-makers and the public voluntarily would implement CA21 (see also Gan S. 1995: 76).

In May 1995, the Central Committee of the Communist Party of China and the State Council approved "The Decision to Promote Progress in Science and Technology", which included a call for the thorough implementation of China's Agenda 21. A national conference on the implementation of China's Agenda 21 was held 27-28 December 1995. By the end of 1996, fourteen governmental agencies had set up leading groups. Nineteen sectors had formulated a sectoral Agenda 21 and action plan.<sup>311</sup> About two-thirds of China's 30 provinces (including Guizhou, Hubei, Shanxi and Sichuan), municipalities (including Beijing), and autonomous regions (including Xinjiang Uighur Autonomous Region) had set up Local Agenda 21 leading groups and/or formulated their own Agenda 21s (Chen 1997: 64, ACCA21 1997a, Guo R. 1997: 66).<sup>312</sup> Several cities have done the same, among them Nanyang (Huang 1997: 69-70, Nanyang LA21 1997), Changzhou (ACCA21 1997a), Benxi (Benxi Agenda 21 Leading Group Office 1994), Shenyang and Wuhan.<sup>313</sup> A number of efforts were made to make the Chinese more aware of CA21. For example, an outline of CA21 was published in the government mouthpiece *People's Daily* 20 November 1994, and the 30-program TV series "China's Agenda 21 Is Not A Dream" was shown by TV stations in almost all provinces (Huang 1997: 74).

In July 1996, on the Fourth National Conference on Environmental Protection held by the State Council, a specific sectoral five-year national plan for China's environmental protection was ratified. It aimed to establish a complete environmental management and legislative system and bring the trend of increasing environmental pollution and environmental degradation under control by 2000, and substantially improve in these fields by 2010. In order to meet these goals, "The Programme for Controlling the Total Amount of Major Pollutants

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<sup>311</sup> Among them were NEPA's "China's Agenda 21 for Environmental Protection"; "China's Ocean Agenda 21" prepared by the State Oceanic Administration (SOA) under the Ministry of Land and Resources (MLR); "China's Agenda 21 on Water Resources" (the Ministry of Water Resources); Meteorological Action Plan for China's Agenda 21" (China Meteorological Administration), and the "Forestry Action Plan for China's Agenda 21", formulated by the then Ministry of Forestry, which is now the State Forestry Administration).

<sup>312</sup> See also ACCA21 (1995a).

<sup>313</sup> UNDP (1998c), "Summary of China's National Agenda 21", URL: <http://www.unchina.org/undp/shd/html/agenda21.htm> (15 May 1999).

during the Ninth Five-Year Plan” and the “China Trans-Century Green Plan” (NEPA 1997) were introduced.<sup>314</sup> The latter’s primary focus is on the water pollution of three rivers (the Huaihe River, Haihe River, and Liaohe River) and three lakes (Taihu Lake, Dianchi Lake, and Chaohu Lake); acid rain in south-western, central, southern, and eastern China; as well as air pollution in 30 key cities. The former specifies strict regulations in order to control the total amount of 12 major pollutants.

An updated Priority Programme (ACCA21 1996a), containing 19 revised projects from PPCA21 1994 and 46 new projects with a total budget of 2.43 billion USD, was released in connection with “the Second High-Level Roundtable Conference on China’s Agenda 21”, 26-31 October 1996. The new projects were selected from 300 new project proposals. Including the unchanged projects from PPCA21 1994, this gives 128 CA21 projects.<sup>315</sup> A list of investment projects (82 commercial investment projects, and 25 infrastructure projects, total budget 4.17 billion USD) was also distributed together with the revised Priority Programme.<sup>316</sup> The Chinese authorities made great efforts to assure foreign soft financing to PPCA21 1994, but the results were not impressive (Lunde 1995). This was part of the reason why the second Priority Programme was directed more towards international business than towards governments and multilateral organisations.

As of December 1995, 32 percent of the priority projects in PPCA21 1994 were reportedly underway, after receiving technical and financial assistance from the domestic and international community (ACCA21 1995a). Potential partners had expressed interest in and begun work on 85% of the priority projects. At the time the revised Priority Programme was issued (October 1996), 41.5 percent of the projects were underway, and 33% were under negotiation. Thirty-six percent of the projects had received international funding. China had invested 1.29 billion USD in the projects, and the international community 330 million USD.<sup>317</sup> Unfortunately, it has proved impossible to obtain more detailed and updated data on the progress of projects and the number of projects actually under implementation.

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<sup>314</sup> For more information, see SEPA (2000a, b).

<sup>315</sup> The reader should note that the two Priority Programmes use different definitions of what constitutes a project. In the revised edition, projects that were entitled subprojects in the 1994 Priority Programme were treated as separate projects.

<sup>316</sup> See ACCA21 (1996c), “Brief Profiles of Investment Projects for China’s Agenda 21”, URL: <http://www.cestt.org.cn/acca21/brief.htm> (14 December 2000), and URL: <http://www.unchina.org/undp/news/html/961106.html> (15 May 1999).

<sup>317</sup> See ACCA21 (1996a), “Introduction”, and Huang (1998: 27). Huang wrote that 41.5 percent of the projects had been implemented, but this was clearly not the case. He also stated that the number of projects under negotiation were 30.5 percent, and not 33 percent.

According to the introduction to the 1996 Priority Programme – which this time contained ads from several large international companies – the revised 1994 projects were modified “as a consequence of rapidly changing economic conditions and new insights gained during the earlier promotional efforts”. The introduction also emphasises that both new and revised projects have been refined in order “to meet international standards, to justify the need for international co-operation, to facilitate project execution and to attract more industrial and commercial participants” and investors; that “[a]lmost all projects are included in either the national or local government’s Ninth Five-Year Plan”; that “[p]rojects of middle and western China are added to promote the development and sustainability of these areas”; that “[p]rojects (...) of non-governmental organisations are added to broaden social participation”; and that “[c]apacity-building and demonstration projects are enhanced”.

One of the new projects was the trial implementation of local Agenda 21s on provincial, municipal and city levels (see e.g. ACCA21/Interconsult Academy 1997, see above). Another, the Centre for Environmentally Sound Technology Transfer (CESTT, sponsored by ADB), was established in 1997, in close collaboration with (and on the premises of) ACCA21. Its mission is to promote co-operation among government departments, research institutions, financial institutions, international organisations and foreign and domestic enterprises, especially between small and medium-sized enterprises (Deng 1998). It aims to build a national network for environmentally technology co-operation between China and foreign partners as well as within China, around CESTT in Beijing. This is to be achieved through establishing partner agencies in East, Central, South, Northeast, Southwest, and Northwest China, respectively.

## **10.4 China's Agenda 21 Project 6-8 - Project description**

### *Project Scope and Relationship to China's Agenda 21*

This project seeks to introduce technologies and facilities for establishing an emergency demonstration centre in the Port of Qingdao, Shandong Province to recover small scale spills and control larger spills. It is based on programme area 12E of China's Agenda 21 concerning promoting sustainable development of transportation and communication.

### **1. Background**

Marine accidents resulting in oil spills and leakage have seriously impacted China's coastal environment. Currently 500 spillage events occur annually and in the latter half of 1993 three tankers exploded in Chinese waters. Spills have become more common in the wake of increased international oil shipment despite more stringent shipping regulations.

The Chinese Government has instituted the "State Emergency Plan for Oil Pollution Management on the High Seas" and formed an emergency response team for pollution in port areas. It has also begun formulating an emergency response plan for spillage from ships. China is now acting in co-operation with adjacent countries to mitigate the impact of accidental spills.

The Ministry of Communications (MOC) launched a program to study and develop emergency response technologies for oil spills during the 6th and 7th Five-Year Plans resulting in the development and application of some technologies. Approximately US\$ 5 million has also been invested to import oil spill control facilities, which have been installed at several major ports.

Spill management technologies include monitoring, identification, warning and recovery components. Some developed countries embarked on spill control technology research in the 1960s and have developed effective prevention and control systems. China is only now developing spill management technologies and has capability of produce a limited number of oil fences, dispersing or coagulation agents and skimmer that are inadequate for addressing its needs. Equipment for oil spill monitoring, recovery, and cleaning remain unavailable. Thus there remains a wide gap between China's capabilities and international spill control technology and personnel training.

Oil spill management technologies are costly and require extensive maintenance. Although China has imported several emergency facilities, these are inadequate for its needs. Currently, none of China's ports are adequately equipped with emergency facilities, nor can they provide training for meeting emergency response requirements.

The port of Qingdao, which is frequently a site of accidents has suffered serious losses due to the lack of the recovery technology and facilities. Therefore, technical and financial aid is needed in order to introduce advanced oil spill monitoring and removal technologies and to establish a marine emergency demonstration centre.

## **2. Objectives**

Introduce technology and facilities for establishing an emergency demonstration centre in the Port of Qingdao to recover small scale spills and control larger spills, according to the model designed by the International Maritime Organization (IMO).

## **3. Activities**

### *3.1 Establish an emergency management administration at the Port of Qingdao*

Install a spill emergency management system at the Port of Qingdao spill management headquarters. Formulate a spill emergency plan and put into operation.

### *3.2 Establish an information system for spill emergency management*

Investigate the location, scope and economic value of aquatic resources; aquaculture; coastal, scenic, sightseeing and protected areas under the jurisdiction of the Port of Qingdao. Investigate and record the historic hydro-meteorological, water quality and geologic data of the region. Estimate the annual output and freight volume of petroleum and determine the specifications and recovery method of frequently transferred petroleum products. Determine the quality, classification, location, and capacity of national spill management facilities along with manpower resources and speciality of experts engaged in emergency response work. Compile information concerning the type, performance, operation, scope of application and cost of spill management facilities and equipment produced in China and abroad. Establish a MIS database for spill management for the above information.

### *3.3 Introduce and adopt spill prevention and management technology*

Introduce advanced spill monitoring and warning systems, including aerial remote sensing, fixed location infrared remote sensing and radar monitoring technology from overseas.

Develop rapid and high precision spill identification technology for application in China and other developing nations. Conduct applied research on spill decontamination for application in China and other developing nations. Introduce and develop spill recovery and treatment technologies. Facilities capable of recovering medium scale spills shall be placed into operation. Develop spill contamination loss estimates and evaluate the cost for emergency response and mitigation. Assess the impact of oil spills on coastal and marine ecology.

### *3.4 Build capacity for prevention and control of oil spills.*

Select and send personnel for spill management training programs organized by IMO. Invite international experts to China to train Chinese spill management personnel. Train administrative officers, managers and emergency response personnel and being participated in practice drills. Disseminate spill prevention and control information about emergency response personnel and the general population in anticipation of their participating in catastrophic spill imitation efforts.

This project will be jointly undertaken by MOC, the Port of Qingdao and relevant Research and Design Institutes. The duration of this project will be three years.

## **4. Inputs**

Items	Chinese inputs	External inputs		Total
		Grant	Soft loan	
Training	0.6	0.5	-	1.1
Data	0.1	0.1	-	0.2
Introduction of technology	0.6	0.1	0.5	1.2
Facilities and equipment	5.7	0.3	1.5	7.5
<b>Total</b>	7.0	1.0	2.0	10.0

## 5. Benefits

This project will assist the Port of Qingdao to prevent and manage accidental oil spills from marine accidents. The project will introduce state of the art spill control technology to China and develop emergency response management capabilities. The proposed demonstration centre will not only act as an example for other ports to follow, but also lay a foundation for establishing an overall spill emergency response system throughout China and the region. Improving China's spill prevention and management capabilities would at minimum reduce annual economic losses by US\$ 10 million and protect nation's coastal environment and biological resources.

Source: "China Dimensions", SEDAC/CIESIN, URL: <http://sedac.ciesin.org/china/policy/acca21/216-8.html> (20 January 2001). The formatting of the document has been slightly changed, but the text remains unedited.

## **10.5 Overview of CA21 projects involving Norwegian business and government<sup>318</sup>**

6-2B Waste water treatment demonstration project

Leading company: NORPLAN

6-7A Site investigation and design of nuclear waste disposal

Leading company: Norwegian Geotechnical Institute

6-8 Prevention and control of marine oil spills

Leading company: Kværner Engineering Environment

8-8A China's natural disaster management system

8-8B Establishment of disaster prevention and management centre, Pudong new area, Shanghai

Leading company: Quasar Consultants

Source: Interviews, Lunde *et al.* (1995)

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<sup>318</sup> Norwegian consortia consisting of 3-8 companies and – to a lesser extent – government agencies – were formed for all projects.

## **10.6 Chinese governmental structure**

See next page. The source of the chart is Brahm (1998). Please observe that while the figure is illustrative, it is not entirely correct. For example, a number of units having deputy ministerial status – among them State Environmental Protection Administration (SEPA), and State Oceanic Administration (SOA), have mistakenly been assigned bureau status.