

CIAS DISCUSSION PAPER No.4

TRANSBORDER ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT

Wil de Jong (editor)



CIAS

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AND
NATURAL RESOURCE MANAGEMENT

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Center for Integrated Area Studies, Kyoto University
Kyoto, Japan 2008

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March, 2008

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Introduction to the CIAS Discussion Paper 4

Environments and the natural resources they hold often straddle across country borders. Or, where it concerns sea resources like the highly valued blue tuna, they exist in habitats that are not part of any national territory. The management of these environments and resources are largely national affairs, even when regulated by international treaties. The transborder environments and natural resources have increased in importance as exploitable assets or for their conservation value, and this calls for a transborder approach to their management. For that reason, CIAS and the Center for Environmental Sciences (CML), Leiden University, The Center for Asia Pacific Area Studies (CAPAS), Academia Sinica and the United Nations University invited 22 scientists from Japan and 10 other countries to share their analysis of an equal number of cases of transborder environments and natural resources, where bilateral or multilateral management is urgently needed. The symposium was held December 5 to 7 at Kyoto University. This CIAS Discussion Paper with the same title “Transborder Environmental and Natural Resource Management” includes 17 papers that were presented at the symposium.

The cases discussed by the 22 scientists covered different habitats and resources, including river systems in Europe and the Greater Mekong Sub-region, international sea commodities like tuna fish and sea cucumber, tropical forest habitats in Southeast Asia, Africa and South America that cross from one country’s borderlands into the neighbor’s, and even yellow dust that originates in Chinese and Mongolian deserts, but impacts the daily lives of people in Korea and elsewhere. The participants all agreed that transborder management of environments and natural resources shared by two or more countries is urgent and widespread, but that the great diversity of cases makes it difficult to draw generally applicable conclusions and principles.

The analysis of the cases presented focus on regulatory and policy frameworks and their challenges, the negotiations and actual cooperation for transborder management, and the effectiveness of the latter where it is taking place. Some of the papers focused on tools and policies that need to be developed to address the particularities of transborder management, as opposed to management that is entirely a one country national affair.

The papers demonstrate that in quite a few cases bi- or multilateral cooperation is widely advanced, especially where economic benefits, or future damage and consequently high economic costs are at stake. Multilateral management of tuna stocks, hydropower generation in the Greater Mekong Sub-region and threatening future floods in Western Europe’s major rivers systems are issues that receive much attention in bilateral or multilateral forums.

Transborder conservation of protected areas or endangered species has been common since the 1990s. The overall effectiveness of the bi- or multilateral management of these transborder protected areas, however, seems to be defined by the participating country that has the weakest effectiveness of its own conservation efforts. Hence, in cases where conservation efforts in one country are marred by a lack of funds, institutional weaknesses or corruption, engagement in transborder conservation may not lead to the desired positive effect.

Many countries with tropical forest regions were characterized by a persistent lack of presence of state institutions and application of the rule of law in their borderlands. Transborder economic and cultural integration did for many decades run ahead of the growing state presence resulting from improving infrastructure and communication. As a result in these locations tropical forest borderlanders have developed economic and cultural ties with their counterparts across the border, but these ties are constrained by national legislation and policies dictated from the centers of government. While insipient transborderland institutional coordination of natural resource management is emerging, the outcome of these initiatives are yet hard to foreseen, as they develop in a highly complicated political and institutional setting.

The papers presented at the Transborder Environmental and Natural Resource Management symposium, compiled in this volume, brought together a rich experience of cases that adequately represented the complexity and diversity of the theme. The overarching conclusion of the symposium is that transborder management of environments and natural resources is urgently needed, and this needs to go hand in hand with relevant and appropriate academic research to inform future practices of this nature.

Kyoto University, the ASEM Education Hub and the ASIA Europe Foundation provide financial support for the organization of the event.

Part One

Transborder Marine and River Resource Management

The Efforts of ICCAT to Combat IUU Fishing: Japan's Push and Taiwan's Response in Conserving and Managing Tuna Resources

Yann-huei Song

Abstract: It is widely recognized within the international fisheries management arena that illegal, unreported and unregulated (IUU) fishing threatens the sustainability of world fish stocks on the high seas, in particular such high-value species as Patagonian toothfish and tuna. Estimates of the total size of IUU catch and its impact on the environment vary widely, but the UN Food and Agriculture Organization (FAO) reported that for some important fishing areas, IUU fishing accounts for up to 30% of total catches and that for some species, IUU catches could be up to three times the permitted amount. The UN General Assembly, in its resolution, reiterates its serious concern over the negative impact of IUU fishing on sustainable fisheries, stating that “IUU fishing remains one of the greatest threats to marine ecosystem and continues to have serious and major implications for the conservation and management of ocean resources.” Recognition of the inability of existing international instruments to effectively address IUU fishing led to the adoption of an FAO International Plan of Action (IPOA) to prevent, deter and eliminate IUU fishing in 2001. The IPOA-IUU encourages states and regional fishery management organizations (RFMOs) to use all available measures in accordance with international law to combat IUU fishing. At the 2000 ICCAT meeting, two supplemental resolutions, focused on Japan and Taiwan’s role in IUU fishing, were adopted, in which ICCAT pressured Taiwan and Japan to “take every possible action” to halt IUU fishing. New measures have also been taken by ICCAT since the adoption of the IPOA-IUU in 2001. About the same time, Japan began to voice its concerns about IUU fishing at several ICCAT meetings, in particular focusing on Taiwan. As a result of the proposal submitted by Japan, ICCAT at its 2005 meeting adopted a recommendation to cut Taiwan’s allowable catch of bigeye tuna from 14,900 metric tons in 2005 to 4,600 metric tons for 2006 in the Atlantic Ocean and the Mediterranean. In response to the ICCAT recommendation, Taiwan took further actions to reduce the size of its tuna fleet and adopted stricter policy measures to manage its tuna fishery. As a result, in November 2006 ICCAT at its special meeting adopted a new recommendation restoring Taiwan’s tuna quota to the 14,900 metric tons level for 2007. The purpose of this paper is to take ICCAT and the interplay between two of its members, Japan and Taiwan, as an example to demonstrate state and international efforts to combat IUU fishing. This study intends to focus on changes in Japan’s and Taiwan’s fishing policies, the bilateral negotiations and agreements between them affecting fisheries resource management of ICCAT, and the effectiveness of the revised policies, negotiations, agreements and decisions in addressing the threat of IUU fishing to the sustainability of world’s tuna stocks.

1.1 Introduction

It is widely recognized within the international fisheries management arena that illegal, unreported and unregulated (IUU) fishing threatens the sustainability of world fish stocks on the high seas, in particular that of such high-value species as Patagonian toothfish and tuna. Estimates of the total size of IUU catch and its impact on the environment vary widely, but the United Nations Food and Agriculture Organization (FAO) reported that for some important fishing areas, IUU fishing accounts for up to 30% of total catches and that for some species, IUU catches could be up to three times the permitted amount.¹ A study by the UK Marine Resources Assessment Group estimated that the global value of IUU fishing is between US\$4 billion and US\$9 billion annually.² The UN General Assembly, in its resolution, reiterates its serious concern with the negative impact of IUU fishing on sustainable fisheries, stating that “IUU fishing remains one of the greatest threats to the marine ecosystem and continues to have serious and major implications for the conservation and management of ocean resources.”³

1. “Fighting fish piracy,” *OECD Observer*, February 2006, available at: http://www.oecdobserver.org/news/fullstory.php/aid/1929/Fighting_fish_piracy.html

2. “Time to tackle illegal fishing,” *id21 insights*, #65, December 2006, available at: <http://www.id21.org/insights/insights65/art02.html>

3. UN General Assembly A/RES/60/31, 2006, para. 33.

Recognition of the inability of existing international instruments to effectively address IUU fishing led to the adoption of an FAO International Plan of Action (IPOA) to prevent, deter and eliminate IUU fishing in 2001.⁴ The IPOA-IUU encourages states and regional fishery management organizations (RFMOs) to use all available measures in accordance with international law to combat IUU fishing, including port states measures, coastal state measures, national legislation, sanctions, economic incentives, education, monitoring, control and surveillance (MCS) systems, and internationally agreed market-related measures.

Two years before the adoption of the IPOA-IUU, the International Commission for the Conservation of the Atlantic Tuna (ICCAT)⁵ urged its members to take remedial action to combat IUU fishing. In 1999, for instance, ICCAT adopted a resolution, asking Japan and Taiwan, the two of the most important distant-water fishing nations in the world's tuna fishery, to take further actions against IUU fishing activities.⁶ At the 2000 ICCAT meeting, two supplemental resolutions were adopted in which ICCAT continued pressuring Taiwan and Japan to "take every possible action" to halt IUU fishing.⁷

New measures have also been taken by the ICCAT since the adoption of the IPOA-IUU in 2001. About the same time, Japan began to vocalize its concerns about IUU fishing and overcapacity at several ICCAT meetings, in particular focusing on Taiwan. As a result of the proposal submitted by Japan, ICCAT at its 2005 meeting adopted a recommendation to cut Taiwan's allowable catch of bigeye tuna from 14,900 tons in 2005 to 4,600 tons for 2006 in the Atlantic Ocean and the Mediterranean Sea. The Commission also decided that only 15 of Taiwan's 60 bigeye tuna fishing vessels would be allowed to continue operating in the Atlantic Ocean in 2006.⁸

In response to the ICCAT recommendation, the Taiwanese government announced that it would require that 41 tuna-catching ships be scrapped or have their licenses suspended; it allocated up to NT\$18 million as a subsidy for each ship to be removed from the fleet. Additionally, the government allocated NT\$50 million annually to place observers on every distant-water fishing ship flagged by Taiwan.⁹ As a result, in its annual November 2006 meeting, the ICCAT adopted a new recommendation restoring Taiwan's tuna quota to the 14,900 tons level for 2007.¹⁰ ICCAT also decided that in 2007 no more than 64 of Taiwan's bigeye tuna fishing vessels would be allowed to operate in open seas. In 2008, the number would be further limited to no more than 60.¹¹

The purpose of this paper is to take the ICCAT and the interplay between two of its members, namely, Japan and Taiwan, as examples of state and international efforts to combat IUU fishing. The study will focus on changes in Taiwan's fishing policies, bilateral negotiations and agreements between Japan and Taiwan affecting fisheries resource management of ICCAT, and the effectiveness of the revised policies, negotiations, agreements and decisions in addressing the threat of IUU fishing to the sustainability of world's tuna stocks.

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4. FAO International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing [hereinafter IPOA-IUU] (endorsed by FAO on June 23, 2001), available at <http://www.fao.org/figis/servlet/static?dom=org&xml=ipoa-IUU.xml>.
 5. ICCAT, established in 1969, is responsible for the conservation of tuna and tuna-like species in the Atlantic Ocean and adjacent seas. For more information about the organization, visit the ICCAT website, <http://www.iccat.es/introduction.htm>.
 6. Resolution by ICCAT Calling for Further Actions Against Illegal, Unregulated, and Unreported Fishing Activities by Large-Scale Long-line Vessels in the Convention Area and Other Areas, Doc. No. 99-11 (1999).
 7. Supplemental Resolution by ICCAT Concerning the Recommendation on the Bigeye Tuna Conservation Measures, Doc. 00-02 (2000). ICCAT members adopted a supplemental resolution concerning the recommendation on the bigeye conservation measures, under which Japan and Taiwan were asked to "take every possible action, consistent with relevant laws, to urge their residents to refrain from engaging in and associated with activities that assist survival of IUU tuna long-line vessels and with any other activities that undermine the effectiveness of the ICCAT bigeye and other conservation and management measures."
 8. The Recommendation by ICCAT Regarding Control of Chinese Taipei's Atlantic Bigeye Tuna Fishery [Rec. 05-02], 2005.
 9. Deborah Kuo, "World Tuna Group Resolves to Cut Taiwan's Annual Catch Limit," *Central News Agency* (Taiwan), Nov. 20, 2005 (Lexis News Search, page number not available) "Taiwan: Government to Idle 41 Atlantic Tuna Ships Next Year," *Pacific Magazine*, November 22, 2005.
 10. Recommendation by ICCAT Regarding Chinese Taipei [06-01], see ICCAT Report 2006-2007 (I), Annex 5, Recommendations Adopted by ICCAT in 2006. See also Annie Huang, "ICCAT Restores Taiwan's tuna quota for 2007," *Taiwan Journal*, December 8, 2006, available at: <http://taiwanjournal.nat.gov.tw/ct.asp?CtNode=122&Item=23563>
 11. ICCAT Recommendation (06-01), paragraph 1, *Ibid*.

The paper is divided in eight parts. After this introduction, Section 2 defines the activities that are considered IUU fishing. Section 3 identifies the problem of IUU fishing and explains the threat it poses to the world's tuna resources. Section 4 reviews international efforts, in particular those taken by RFMOs, to combat IUU Fishing. This will be followed in Section 5 by a brief examination of the efforts taken by ICCAT to deal with the problem. Section 6 discusses the interplay between Japan and Taiwan at ICCAT in relation to the conservation and management of tuna resources and the efforts to deal with the problem of IUU fishing. Section 7 examines changes in Taiwan's fishing management policies. Section 8 ends the paper with an evaluation of the effectiveness of the efforts undertaken by ICCAT to combat IUU fishing conducted by fishing vessels of its members.

1.2 What Is IUU Fishing?

IUU fishing refers to the fishing activities that are carried out in a manner that is inconsistent with, or in contradiction with, the conservation and management measures in force for a particular fishery. It involves illegitimate fishing practices that include: noncompliance with fishing seasons, fishing without proper permits, harvesting prohibited species, using illegal fishing gear, disregarding catch quotas, and not reporting or underreporting the amount of fish caught.¹²

It was reported that the first formal mention of IUU fishing appeared at the 16th annual meeting of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) in 1997.¹³ IUU fishing was later addressed at length in the 1999 Secretary-General's Report to the UN General Assembly. In November 1999, the General Assembly adopted Resolution 54/32, which also included references to combat IUU fishing.¹⁴ The term "IUU fishing" has subsequently been diffused into other international fisheries discussions.

IUU fishing includes three types of fishing activities, namely, "illegal," "unreported," and "unregulated" fishing activities. The term "illegal fishing" is defined in the 2001 IPOA-IUU as activities:

- Conducted by national or foreign vessels in waters under the jurisdiction of a State, without the permission of that State, or in contravention of its laws and regulations;
- Conducted by vessels flying the flag of States that are parties to a relevant regional fisheries management organization but operate in contravention of the conservation and management measures adopted by that organization and by which the State are bound, or relevant provisions of the applicable international law;
- In violation of national laws or international obligations, including those undertaken by cooperating States to a relevant regional fisheries management organization.

The term "unreported fishing" refers to those activities:

- Which have not been reported, or have been misreported, to the relevant authority, in contravention of national laws and regulations;
- Undertaken in the area of competence of a relevant regional fisheries management organization which have not been reported or have been misreported, in contravention of the reporting procedures of that organization.

The term "unregulated fishing" refers to fishing activities:

- In the area of application of a relevant regional fisheries management organization that are conducted by vessels without nationality, by those flying the flag of a State not party to that organization, or by a fishing entity, in a manner that is not consistent with or jeopardizes the conservation and management measures of that organization;
- In areas or for fish stocks in relation to which there are no applicable conservation or management measures and where such fishing activities are conducted in a manner inconsistent with State responsibilities for the conservation of living marine resources under international law.¹⁵

12. See FAO, "Excess Capacity and Illegal Fishing: Challenges to Sustainable Fisheries" (Rome, Italy: FAO, 2004), FAO news story, available at: <http://www.fao.org/newsroom/en/focus/2004/47127/index.html>

13. Item 5 of the discussion at the meeting was "Illegal, Unreported and Unregulated Fishing in the Convention Area". For the report, visit the website of the Commission at: http://www.ccamlr.org/pu/E/e_pubs/cr/97/toc.htm See "Short History of International Actions and Initiatives against IUU Fishing Activities," in the website of the Organization for Economic Co-operation and Development (OECD), available at: http://www.oecd.org/document/24/0,3343,en_2649_33901_23460_248_1_1_1_1,00.html

14. Ibid.

15. Paragraph 3 of the IPOA-IUU, *supra* note 4.

It should be noted that while IUU fishing is certainly a major problem on the high seas, it is also clear that it threatens responsible fishery management within the exclusive economic zones (EEZs) of coastal states. In addition, certain unregulated fishing activities may take place in a manner which is not in violation of applicable international law, and may not require the application of measures envisaged under the IPOA-IUU.¹⁶

In April 2007, the National Marine Fisheries Service, National Oceanic and Atmospheric Administration under the U.S. Department of Commerce, published a rule to satisfy the requirement in section 403 of the Magnuson-Stevens Fishery Conservation and Management Authorization Act (MSRA) of 2006, in which the term “IUU fishing” is defined as:

- Fishing activities that violate conservation and management measures required under an international fishery management agreement to which the United States is a party, including catch limits or quotas, capacity restrictions, and by-catch reduction requirement;
- Overfishing of fish stocks shared by the United States, for which there are no applicable international conservation or management measures or in areas with no applicable international fishery management organizations or agreement, that has adverse impacts on such stocks;
- Fishing activity that has an adverse impact on seamounts, hydrothermal vents, and cold water corals located beyond national jurisdiction, for which there are no applicable conservation or management measures or in areas with no applicable international fishery management organizations or agreement.¹⁷

In short, the term “IUU fishing,” in a broader sense, is understood as all unsustainable fishing practices that are inconsistent with, or in contravention of, the existing conservation and management measures adopted by the authorities of states, RFMOs, and international governmental organizations.

1.3 The Threat of IUU Fishing to the Sustainability of World’s Tuna Resources

It was estimated by the UN FAO scientists that in 2004 half of the fish stocks being monitored were close to or at full exploitation levels, with 17 per cent rated as overexploited, seven per cent actually depleted and another one per cent recovering from depletion.¹⁸ Much attention has especially been given to the current problems of protecting the world’s tuna resources.

Tuna are highly migratory species, and fishing for these stocks takes place both within and beyond the 200-mile EEZs of individual coastal states. Together, the seven principle market tuna or tuna-like species – albacore (*Thunnus alalunga*), Atlantic bluefin (*Thunnus thynnus*), bigeye (*Thunnus obesus*), Pacific bluefin (*Thunnus orientalis*), skipjack (*Katsuwonus pelamis*), Southern bluefin (*Thunnus maccoyli*), and yellowfin (*Thunnus albacares*) – are the single-most important resources exploited on the high seas, accounting for over seven per cent of total marine fish capture, and 11 per cent of the total value of fish landings for consumption.¹⁹ In 2002, the value of the tuna export catch was a massive US\$ 5 billion.²⁰

Fifty years ago, high-seas tuna stocks were abundant, with many tuna stocks not yet fished commercially at an intensive level, and there appeared to be no serious danger of any sharp population decline. Today, while most tuna stocks are not yet at the edge of depletion – that is, not yet declined to the point where commercial fishing is no longer profitable or a stock is faced with “collapse” – these stocks, like numerous other high-value species of fish, are clearly at serious risk. As reported in the FAO Technical Paper No. 495, where the state of exploitation is known, 21 per cent of highly migratory tuna and tuna-like species are moderately exploited, 50 per cent are fully exploited, 21 per cent are

16. See paragraph 3.4 of the IPOA-IUU, Ibid.

17. Department of Commerce, National Oceanic and Atmospheric Administration, 50 CFR Part 300, Illegal, Unreported, or Unregulated Fishing, *Federal Register*, Vol. 72, No. 70, April 12, 2007, Rules and Regulations, 18404-18405.

18. United Nations, Press Release SEA/1852 (“United Nations Conference to Address Law for High Seas Fishing, 22-26 May, 2006 as Overfishing Causes Dramatic Decline in Stocks (18 May 2006)

19. See FAO Fisheries Department, FAO (2004) *State of World Fisheries and Aquaculture (SOFIA)* – SOFIA 2004.

20. See *Second meeting of the Technical Advisory Committee of the FAO project Management of tuna fishing capacity: conservation and socio-economics*, Madrid, Spain, March 15-18, 2004, edited by William H. Bayliff, Juan Ignacio de Leiva Moreno, and Jacek Majkowski. FAO Fisheries Proceedings No. 2, Rome, FAO, 2005, available at: <http://www.fao.org/docrep/008/y5984e/y5984e00.htm>

overexploited and eight per cent (southern bluefin and bluefin in the western Atlantic) are depleted.²¹

High levels of IUU fishing are identified as one of the major problems causing the rapid over-exploitation and depletion of the world's major tuna stocks.²² However, it is recognized that any attempt to quantify the scale of the problem of IUU fishing faces formidable obstacles. While no reliable estimates of IUU fishing are available, the UN General Assembly has assessed that, in some of the more valuable fisheries, IUU fishing has accounted for up to 30 per cent of the total catches and the illegal and unreported catch could be three times the permitted catch.²³ According to estimates done by TRAFFIC International and CCAMLR, the trade estimates of IUU catch was 33,865 tons and accounted for 57 per cent of the total estimated trade in Patagonian toothfish in 1999/2000, four times that of CCAMLR's estimates of 8,418 tons.²⁴ In terms of value, the 2006 Final Report of the Ministerial-led Task Force on IUU Fishing on the High Seas suggested that the global value of IUU fishing lies somewhere between US\$4.2 billion and US\$9.5 billion. The portion of this figure that can be directly attributed to IUU fishing on the high seas amounts to some US\$1.25 billion.²⁵ As far as tuna and tuna-like species are concerned, the value of IUU fishing for bluefin was estimated at US\$33 million; and for skipjack, yellowfin, albacore, bigeye, it was US\$548 million.²⁶

In addition to the impact on trade as noted above, IUU fishing also has negative ecological and social effects. IUU fishing threatens sustainability of world fish stocks on the high seas because it undermines national and regional efforts to conserve and manage fish stocks and, as a consequence, inhibits progress towards achieving the goals of long-term sustainability and responsibility as set forth in the existing international rules and regulations concerning fisheries conservation and management. IUU fishing activities also have adverse effects on the marine ecosystem, notably on the populations of seabirds, marine mammals, sea turtles and bio-diversity as a whole. In addition, IUU fishing distorts competition and jeopardizes the economic survival of those who fish in accordance with the law and in compliance with relevant conservation and management measures. Moreover, IUU fishing adversely and directly affects the livelihoods of fishing communities, particularly in developing countries, by undermining the tuna stocks on which they depend. It is also often found that IUU operators take advantage of an endless supply of unskilled labor desperate for income. Due to the lack of effective management and control by open-registry (flag of convenience) states, IUU operators have weak incentives to meet international standards on maritime safety and working conditions on ships.²⁷

In short, IUU fishing has adverse economic, biological and social consequences and is considered one of the most serious threats to the health of the world's fisheries and oceans. Accordingly, it has been urged that national, regional and international actions be taken to curb IUU fishing.

1.4 National, Regional, and International Efforts to Combat IUU Fishing

Countries that are party to international fisheries treaties, or which agree to be bound by other international legal instruments concerning the protection and preservation of the marine environment, both regarding international hard

21. Jean-Jacques Maguire, Michael Sissenwine, Jorge Csirke, Richard Grainger and Serge Garcia, *The state of world highly migratory, straddling and other high seas fishery resources and associated species*, FAO Fisheries Technical Paper 495, Rome, FAO, 2006, available at <http://www.fao.org/docrep/009/a0653e/a0653e00.htm>

22. See Tuna in trouble: the challenges facing the world's tuna fisheries, WWF Briefing, January 27, 2007, available at: <http://assets.panda.org/downloads/wwftunarfmbriefingfinal.pdf>

23. Cited in Kevin W. Riddle, "Illegal, Unreported, and Unregulated Fishing: Is International Cooperation Contagious?" *Ocean Development and International Law*, Vol. 37, Issue 3&4, December 2006, pp. 266-267. See also Making Sure Fish Piracy Doesn't Pay, *OECD Policy Brief*, January 2006, p. 2.

24. Table 1 (Estimated IUU catch), *Ibid.*, p. 268.

25. Closing the Net: Stopping illegal fishing on the high seas, Final report of the Ministerially-led Task Forces on IUU Fishing on the High Seas, March 2006, p. 18, available at: http://www.high-seas.org/docs/HSTFfinal/HSTFFINAL_web.pdf

26. *Ibid.*

27. See Key Observations and Findings by the Workshop Chairs, Workshop on Illegal, Unreported and Unregulated Fishing activities, April 19-20, 2004, available at: <http://www.oecd.org/dataoecd/55/6/31603545.PDF> and Closing the Net, *supra* note25, p. 20.

law²⁸ or soft law,²⁹ are obliged to cooperate in the conservation and management of high seas marine living resources and adopt measures to combat IUU fishing. In addition, countries that are members of RFMOs, such as ICCAT, or international organizations, such as FAO, also have a duty to adopt policy measures to implement decisions made, and resolutions or recommendations passed by the organizations. Under Article 118 of UNCLOS, for instance, state parties have a duty to co-operate in the conservation and management of the living resources of the high seas. In addition, in accordance with paragraph 25 of the IPOA-IUU, FAO members are asked to develop and implement national plan of actions (NPOAs) to further achieve the objectives of the IPOA-IUU and give full effect to its provisions as an integral part of their fisheries management programs and budgets. The NPOAs should also include actions to implement initiatives adopted by RFMOs to prevent, deter and eliminate IUU fishing. Many of the measures listed the IPOA-IUU have already been implemented by FAO members, including the prohibition of fishing without an authorization, fishing with banned gears and fishing in closed areas and seasons, as well as the attempt to strengthen monitoring, control and surveillance (MCS) capacities, and the introduction of mandatory vessel monitoring system (VMS).

It should be noted that the IPOA-IUU is not a hard law and, therefore, there are no strict rules for the development of NPOAs-IUU. In 2002, forty-seven countries indicated that they had taken steps towards developing NPOAs to fight against IUU fishing and as a means of implementing the IPOA-IUU.³⁰ However, according to information available to the FAO in June 2006, not more than 25 NPOAs-IUU had been elaborated and no NPOAs-IUU had been developed in the South Asian sub-region.³¹ As of October 2007, Australia, Canada, Chile, New Zealand, the European Commission, United States, and Republic of Korea have submitted their NOPAs-IUU to the FAO.³²

As noted earlier, in recognition of the increasing exploitation of world fish stocks and unregulated high seas fishing, in 2001, the FAO adopted the IPOA-IUU.³³ This is a voluntary agreement that attempts to tackle the growing problem of IUU fishing “by providing all States with comprehensive, effective and transparent measures by which to act, including through appropriate regional fisheries management organizations established in accordance with

28. Hard law is usually understood as legally-binding, that is, the rights and obligations of states as incorporated in agreements, treaties or conventions. These legal instruments become hard laws after they have been ratified by enough national parliaments. The international legal instruments related to conservation and management of marine living resources and are considered hard law include: United Nations Convention on the Law of the Sea (UNCLOS, 1982), Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (The Compliance Agreement, 1993), Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (The Fish Stocks Agreement, 1995), Convention on Biological Diversity (1992), Cartagena Protocol on Biosafety (2000), Convention on Climate Change (1992), and the Kyoto Protocol (1997).

29. Soft law is usually adopted when a principle emerges, where states recognize the value of that principle, but are not yet willing to be bound by it. Those instruments on principles with little or no official legal security are considered “soft law”. Quite often these agreements on principles are laid down in declarations, charters, and so forth that reflect ethical conceptions that have not yet found their way into law. The soft law in the areas of conservation and management of marine living resources includes: Chapter 17 of Agenda 21 of UNCED (1992), The Jakarta Mandate on Marine and Coastal Biological Diversity (1995), The Rome Consensus on World Fisheries (1995), The Code of Conduct for Responsible Fisheries (1995), The Kyoto Declaration and Plan of action on Sustainable Contribution of Fisheries to Food Security (1995), The International Plans of Action for the Management of Fishing Capacity, for Reducing Incident Catch of Seabirds in Long-line Fisheries, and for Conservation and Management of Sharks (1999), and the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated (IUU) Fishing (2001), FAO Strategy for Improving Information on Status and Trends of Capture Fisheries (2003), FAO Standard Specifications and Guidelines for the Making and Identification of Fishing Vessels (1989), FAO Guidelines to Reduce Sea Turtle Mortality in Fishing Operations (2003), and FAO Model Scheme on Port State Measures to Combat IUU Fishing (2007).

30. David J. Douman, *Global Overview of Illegal, Unreported and Unregulated Fishing and Its Impacts on National and Regional Efforts to Sustainably Manage Fisheries: The Rational for the Conclusion of the 2001 FAO International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing*, August 2003, p. 7, available at: <ftp://ftp.fao.org/fi/document/Ec-OpenRegistries/doulman.pdf>

31. Report of the FAO Regional Workshop on the Elaboration of National Plans of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing – South Asian Subregion, Bangkok, Thailand, 19-23 June 2006, FAO Fisheries Report No. 809, Rome, FAO, 2006.p. 7.

32. For the text of these NPOAs-IUU, visit the website of FAO at: http://www.fao.org/fi/website/FIRetrieveAction.do?dom=org&xml=ipoa_IUU.xml

33. *Supra* note 4.

international law.”³⁴ The FAO and its member states have increasingly recognized the importance of the link between IUU fishing and fleet overcapacity. For example, at the 2005 FAO Ministerial Meeting on Fisheries, participating fisheries ministers and their representatives adopted a declaration that explicitly identified the relationship between fleet overcapacity and IUU fishing, referring to the economic incentives that drive these phenomena. It also noted the harmful worldwide consequences of IUU fishing on the sustainability of fisheries, on the conservation of marine living resources, and on marine biodiversity as a whole. The declaration also cites the harmful effects of IUU fishing on the economies of developing countries and their efforts to develop sustainable fisheries management.³⁵

In March 2007, at the twenty-seventh session of the Committee on Fisheries, FAO, it was agreed that despite the substantial efforts made by member states and RFMOs, IUU fishing “remained a grave threat to sustainability” and therefore it should be addressed comprehensively.³⁶ In addition, it was recognized that all those involved in IUU fishing, such as the owners of fishing vessels, as well as of transshipment and support vessels, should be included in the scope of measures to combat IUU fishing. Moreover, it was also found that some members of RFMOs did not comply with the rules and measures of their organization to fight against IUU fishing.³⁷ Finally, the Committee encouraged FAO members to join or cooperate with the voluntary International Monitoring, Control and Surveillance (MCS) Network,³⁸ to develop a new, legally binding instrument based on the Model Scheme on Port State Measures to Combat IUU Fishing and the IPOA-IUU, and to further develop a comprehensive global record of fishing vessels.³⁹

At the first meeting of the Regional Fishery Body (RFB) Secretariats Network, held in Rome on in March 2007, IUU fishing was one of the issues of common interest to regional fisheries bodies and considered extensively. It was expressed that a key issue to be addressed in combating IUU fishing is a lack of vital information. It was noted that the priorities of various RFMOs in combating IUU fishing include developing integrated MCS packages, centralized VMS, regional observer programs, operational high-seas boarding and inspection regimes, inspector exchanges, and formally constituted compliance committees. Moreover, the increasing and dramatic success of blacklisting procedures, used by RFMOs as a means of combating IUU fishing activities by both harvesting and reefer vessels, was also noted at the meeting. It was pointed out that the effectiveness of blacklisting depends strongly upon effective port state measures.⁴⁰

In June 2007, at the eighth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea, it was proposed that the tenth meeting of the Process in 2009 could focus on combating IUU fishing. In addition, it was also suggested that the effort to combat IUU fishing could benefit from attention in future work of the UN General assembly on oceans and the law of the sea.⁴¹ In the 2007 advanced and unedited reporting materials issued as part of the report of the UN Secretary-General on sustainable fisheries, measures taken by states, RFMOs, and regional arrangements, and other relevant organizations to address unsustainable fishing practices, including IUU fishing, were reported.⁴² The measures taken by states include: (1) legal and policy framework and

34. Paragraph 8, *Ibid.*

35. See 2005 Rome Declaration on Illegal, Unreported and Unregulated Fishing (adopted by FAO Ministerial Meeting on Fisheries on March 12, 2005), available at <http://ftp.fao.org/fi/DOCUMENT/ministerial/2005/iuu/declaration.pdf>.

36. Report of the twenty-seventh session of the Committee on Fisheries, Rome, 5-9 March 2007, FAO Fisheries Report No. 830, para. 17, available at: <http://www.fao.org/docrep/010/a1160e/a1160e00.htm>

37. Para. 67, *Ibid.*

38. For the information about the network, visit <http://imcsnet.org/>

39. Report of the twenty-seventh session of the Committee on Fisheries, *supra* note 36, paras. 68 and 72.

40. Report of the First Meeting of Regional Fishery Body Secretariats Network, Rome, March 12-13, 2007, FAO Fisheries Report No. 837, available at: <ftp://ftp.fao.org/docrep/fao/010/a1184e/a1184e00.pdf> paras. 45-56.

41. Eighth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea, June 25-29, 2007, Report on the work of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea at its eighth meeting, A/62/169, available at: <http://daccessdds.un.org/doc/UNDOC/GEN/N07/443/75/PDF/N0744375.pdf?OpenElement>, para. 120 (p. 24) and Part B (Issues that could benefit from attention in future work of the General Assembly on oceans and the law of the sea), p. 25.

42. Advanced and unedited reporting material to be issued as the report of the Secretary-General on sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of straddling Fish Stocks and Highly Migratory Fish Stocks, and related instrument, Sixty-second session, Item 79(b) of the preliminary list, Oceans and the Law of the Sea, Report of the Secretary, 2007, available at: http://www.un.org/Depts/los/general_assembly/documents/sustainable%20fisheries_advance_unedited_2007.pdf

cooperative arrangements to combat IUU fishing; (2) implementation of flag states duties; (3) implementation of port states measures; and (4) implementation of trade-related measures.⁴³ The report also stated that many RFMOs have stepped up their efforts to combat IUU fishing due to an increased awareness of the adverse impacts of such activities on their management regimes.⁴⁴

Increasingly indeed, rules and measures have been adopted by RFMOs to deal with the problem of IUU fishing. For instance, new expanded procedures for port state control were agreed unanimously by all members of North-East Atlantic Fisheries Commission (NEAFC) in November 2006, which entered into force in May 2007. Vessels on the NEAFC blacklists are banned from entering all European ports. The newly extended procedures also address unreported catches by members of NEAFC when they land frozen fish in foreign ports.⁴⁵ In June 2007, the North Sea Commission (NSC) Marine Resources Group fully supported a resolution adopted at the Annual Business Meeting, in which NSC stated that it will work together at both at political and technical level, to combat IUU fishing, in cooperation with the member regions, and in accordance with national and international legislation and best practice. All member states of the NSC are asked to take part in an active campaign against IUU fishing, and to actively support all international measures taken to combat the problem.⁴⁶

At the 25th annual meeting of CCAMLR, held in October /November 2006, a resolution was adopted, in which member states of the organization were asked to “grant permission for boarding and inspection by designated CCAMLR inspectors of their flag vessels suspected of, or found to be, fishing in an IUU manner in the Convention area.” In addition, members were also requested to seek the cooperation of non-contracting party port states when IUU fishing vessels seek to use the ports of non-contracting parties, urging them to take the steps in accordance with conservation measures taken by CCAMLR.⁴⁷ It was also reported that the European Commission was in the process of preparing a communiqué, which will address IUU fishing and is to be released in October 2007.⁴⁸

Other RFMOs that have acted against IUU fishing include: Commission for the Conservation of Southern Bluefin Tuna (CCSBT), Indian Ocean Tuna Commission (IOTC), Inter-American Tropical Tuna Commission (IATTC), ICCAT, North Atlantic Salmon Conservation Organization (NASCO), Northwest Atlantic Fisheries Organization (NAFO), and Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC). Under the current system of ocean governance, RFMOs are the main bodies responsible for conserving and managing fish stocks in the high seas – the 64% of the oceans lying beyond any nation’s jurisdiction. RFMOs obtain regulatory power in specific geographic areas that are agreed to by the members of the organizations through the conclusion of international agreements or acceptance of regional conservation and management arrangements and therefore are exercising the authority to assess the status of the regulated fish stocks, set total allowable catch (TAC) quotas for fish stocks, set limits on the number of vessels allowed to exploit each fishery, regulate the types of gear that can be used, and conduct inspections to ensure compliance. Accordingly, RFMOs have a central role to play in combating IUU fishing.

Articles 8 and 9 of the 1995 UN Fish Stocks Agreement identifies RFMOs as having a primary role in facilitating co-operation between states in order to achieve the conservation of straddling and highly migratory fish stocks.⁴⁹ Para-

43. Paras. 106-118, Ibid.

44. Paras. 119-125, Ibid.

45. NEAFC closes the net on Illegal, Unreported and Unregulated, IUU, fishing – Port Control enters into force 1 May! NEAFC *Press Release*, April 17, 2007, available at: http://www.neafc.org/news/docs/psc_press_release_17-april_2007.pdf

46. Illegal Unregulated Unreported Fishing activities, Draft resolution for the Annual Business Meeting, June 22, 2007, proposed by Troms fylkeskommune, Norway and support by NSC Marine Resources Group, available at: http://www.north-sea.org/nsc/general_assembly/2007_abm/7_IUUF.pdf

47. Resolution 25/XXV (2006), Combating illegal, unreported and unregulated fishing in the Convention Area by the flag vessels of non-Contracting Parties, para 1 (iv) and para. 2, available at: http://www.ccamlr.org/pu/e/e_pubs/cm/06-07/r25-xxv.pdf

48. See “A Leading Role for the EU in Combating Illegal, Unreported and Unregulated Fishing,” WWF Position Paper, June 8, 2007, available at: http://assets.panda.org/downloads/iuu_position_june_2007.pdf

49. For the text, see *International Fisheries: Instruments with Index*. Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, United Nations, New York, 1998, pp. 7-37. As of August 21, 2007, there were 67 parties to this Agreement. For Chronological list of ratifications/accessions/successions Declarations made upon ratification/accession, visit the website of the United Nations at: http://www.un.org/Depts/los/convention_agreements/convention_overview_fish_stocks.htm

graph 80 of the IPOA-IUU provides that “[s]tates, acting through relevant regional fishery management organizations, should take action to strengthen and develop innovative ways, in conformity with international law, to prevent, deter, and eliminate IUU fishing.”⁵⁰

Among the RFMOs, ICCAT, IATTC, IOTC, CCSBT, and WCPFC are the five currently responsible for the world's tuna fisheries (see Map 1.1). Although the specific mandate and responsibility of each differ, the five RFMOs all have a general objective to conserve and sustainably manage tuna stocks. In addition, they all have made recommendations or passed resolutions directed at preventing, deterring and eliminating IUU fishing. In January 2007, the first joint meeting of tuna RFMOs was held in Kobe, Japan, in which a course of actions for all RFMOs (the so-called Kobe Course of Action) was adopted. In particular related to the problem of IUU fishing, all RFMOs are asked to apply penalties and sanctions of adequate severity to deter IUU fishing by both non-members and members. In addition, RFMOs are also requested to develop and implement stronger measures to prevent, deter and eliminate IUU fishing, which include (1) mechanisms to identify and quantify IUU activities based on trade and other relevant information (2) a system to exchange information on IUU fishing among RFMOs and among flag states, port states and market states and coastal states; (3) consolidation of the positive and negative lists of IUU fishing vessels; (4) effective control over nationals in accordance with their duties under international law; (5) identification of beneficial ownership; and (6) demonstration of “genuine link” and dissemination of relevant information to the public.⁵¹

A full examination of the measures taken by the five tuna RFMOs to conserve and manage tuna resources and to combat IUU fishing is beyond the scope of this paper. However, since ICCAT and the interplay between two of its members, namely, Japan and Taiwan, is used as an example to demonstrate state and international efforts to combat IUU fishing, the effort taken by ICCAT to deal with the unsustainable fishing practice will be addressed in the following section.

1.5 The Effort of ICCAT to Combat IUU Fishing

ICCAT, established in 1969, is responsible for the conservation of tuna and tuna-like species in the Atlantic Ocean and Mediterranean Sea. About 30 species are of direct concern to ICCAT: Atlantic bluefin, skipjack, yellowfin, albacore and bigeye tuna; swordfish; billfishes such as white marlin, blue marlin, sailfish and spearfish; mackerels such as spotted Spanish mackerel and king mackerel; and, small tuna like black skipjack, frigate tuna, and Atlantic bonito.⁵² Based on the information provided by WWF, exploitation of albacore in the Mediterranean Sea is unknown, but in the North Atlantic Ocean is overexploited, and in the South Atlantic Ocean is fully exploited. Bluefin tuna in the Eastern Atlantic Ocean is overexploited, and depleted in the Western Atlantic Ocean. Bigeye and yellowfin tuna in the Atlantic Ocean are also fully exploited. It is not known regarding exploitation state of skipjack in the Eastern and Western Atlantic Ocean.⁵³ Table 1.1 summarizes the state of exploitation of highly migratory tuna and tuna-like stocks in the Atlantic Ocean and other ocean areas. One of the main problems for causing the decline of the high-value tuna stocks regulated under the management regime of ICCAT is believed to be the high levels of IUU fishing.

Beginning in 1992, ICCAT passed resolutions and recommendations in an effort to eliminate IUU fishing for tuna and swordfish in the Atlantic Ocean.⁵⁴ Resolutions in the early 1990s by ICCAT included one encouraging states to deter reflagging⁵⁵ and another creating the bluefin tuna statistical document program that required all bluefin tuna

50. *Supra* note 4.

51. See Letter from Chairman on the course of actions adopted at Kobe, Japan, ICCAT Circular #441/07, March 19, 2007, Attachment 1, available at: http://www.iccat.org/Documents/441-07_ENG.pdf

52. For more information, see *supra* note 5

53. See Table 1: stock status for the principle market tuna species, *Tuna in Trouble: The challenges facing the world's tuna fisheries*, *supra* note 22, p. 5.

54. For an overview of international and regional responses to IUU fishing, see Moritaka Hayashi, *Illegal, Unreported and Unregulated (IUU) Fishing: Global and Regional Response, in Bringing New Law to Ocean Waters*, 95 (David D. Caron & Harry N. Scheiber eds., 2004).

55. Resolution by ICCAT Regarding the Reflagging of Vessels to Avoid Compliance with Internationally Agreed Conservation & Management Measures for Living Marine Resources, Doc. No. 92-3 (1992).

catch to be properly documented.⁵⁶ Also, in 1994, ICCAT created a plan to identify non-compliance vessels, notify the flag state, and recommend ICCAT member countries take trade restrictive measures on Atlantic tuna products from those states.⁵⁷ In 1998, ICCAT expanded its actions regarding non-compliance when it passed a resolution to deal with “unreported and unregulated” tuna catches by long-line vessels in the Atlantic.⁵⁸ This resolution noted the problems of flag-hopping among non-compliance states (where trade restrictive measures had been imposed) to contracting parties or other non-contract states.⁵⁹ ICCAT has continued to recommend trade restrictive measures and has recommended bans on Atlantic catches from several open registry countries including Belize, Cambodia, Honduras, Saint Vincent and the Grenadines, Sierra Leone, Bolivia, Equatorial Guinea, and Georgia.⁶⁰

Table 1.1 Summary of the state of exploitation of highly migratory tuna and tuna-like species by major ocean area

Species/stocks	Major Ocean area	Catch (thousands of tons) ¹					State of exploitation ⁵
		2000	2001	2002	2003	2004 ²	
Albacore (<i>T. alalunga</i>)	Northern Pacific Ocean	81	87	89	15	n.a.	F
	Southern Pacific Ocean	47	47	51	50	n.a.	F
	Mediterranean Sea	6	5	6	8	n.a.	N
	Northern Atlantic Ocean	34	25	23	26	n.a.	O
	South Atlantic Ocean	29	34	32	28	n.a.	F
	Indian Ocean	38	41	33	24	n.a.	M
	Total	235	240	233	150	216	
Bigeye tuna (<i>T. obesus</i>)	Eastern Pacific Ocean	n.a.	n.a.	n.a.	n.a.	n.a.	O
	Western and Central Pacific Ocean	n.a.	n.a.	n.a.	n.a.	n.a.	F
	Atlantic Ocean	102	96	76	85	n.a.	F
	Indian Ocean	129	114	130	139	n.a.	F
	Total	231	210	206	224	113	
Pacific bluefin tuna (<i>T. orientalis</i>)	Pacific Ocean	27	16	16	10	12	F
Atlantic bluefin tuna (<i>T. thynnus</i>)	East Atlantic and Mediterranean Sea	34	35	33	28	n.a.	O
	West Atlantic Ocean	3	3	3	2	n.a.	D
	Total	36	37	36	31	32	
Southern bluefin tuna (<i>T. maccoyii</i>)	Southern Oceans	15	16	15	14	15	D
Skipjack tuna (<i>K. pelamis</i>)	Eastern Pacific Ocean	211	145	161	260	n.a.	M
	Western Pacific Ocean	1 251	1 135	1 295	1 271	n.a.	M
	East Atlantic Ocean	109	118	93	123	n.a.	N
	West Atlantic Ocean	29	31	21	24	n.a.	N
	Indian Ocean	422	426	489	475	n.a.	M-F
	Total	2 022	1 855	2 059	2 153	2 092	
Yellowfin tuna (<i>T. albacares</i>)	Eastern Pacific Ocean	297	424	442	420	n.a.	F
	Western Pacific Ocean	435	427	414	465	n.a.	N
	Atlantic Ocean	133	159	139	124	n.a.	F
	Indian Ocean	307	285	305	400		M-F
	Total	1 172	1 295	1 300	1 408	1 384	

¹ Catch data by stock area from Carocci and Majkowski (2005), unless otherwise stated

² Catch data from FAO FISHSAT Plus

³ Include Atlantic sailfish (*I. albicans*) and longbill spearfish (*T. pluefgeri*)

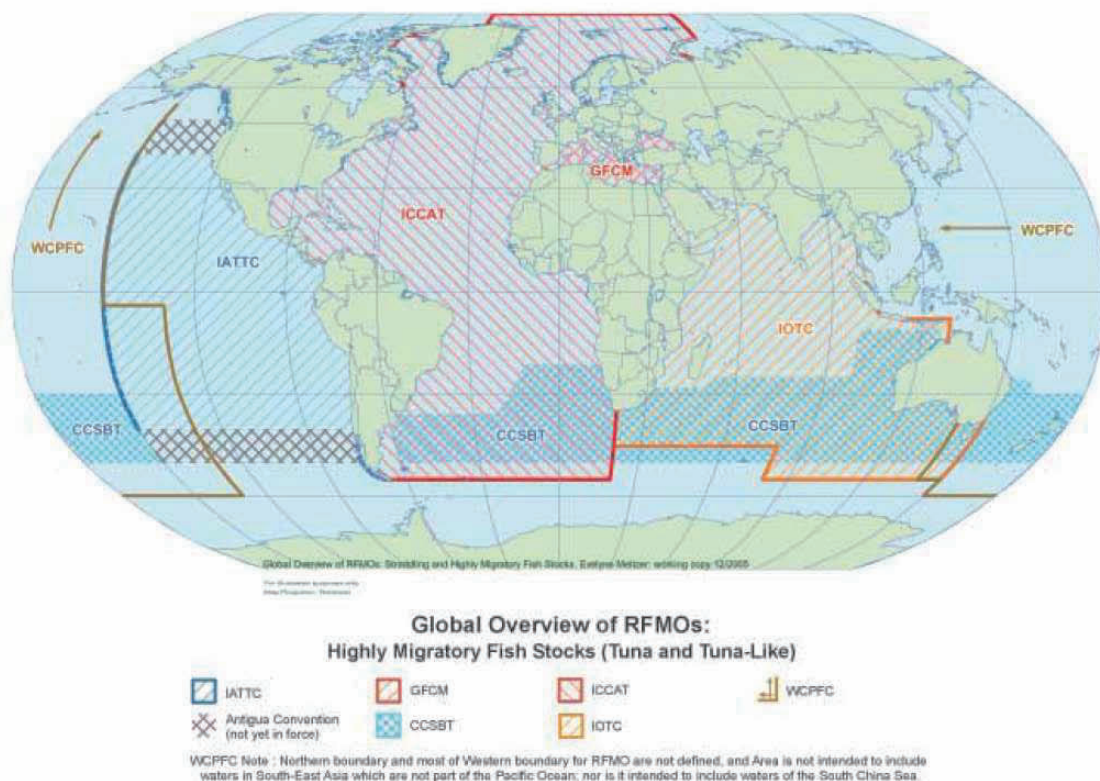
⁴ Include Frigate tuna (*A. thazard*), bullet tuna (*A. rochei*), kawakawa (*E. affinis*), little tunny (*E. alleteratus*) black skipjack (*E. lineatus*) and blackfin tuna (*T. atlanticus*)

⁵ Symbols: N = Not known; U = Underexploited; M = Moderately exploited; F = Fully exploited; O = Overexploited; D = Depleted; R = Recovering

56. Resolution by ICCAT on Interpretation and Application of the ICCAT Bluefin Tuna Statistical Document Program, Doc. No. 94-4 (1994).
57. Resolution by ICCAT Concerning an Action Plan to Ensure Effectiveness of the Conservation Program for Atlantic Bluefin Tuna, Doc. No. 94-3, entered into force Oct. 2, 1995 (1994). Moritaka Hayashi has pointed out that the fact that ICCAT's management area encompasses the entire Atlantic Ocean has enabled ICCAT members to take trade measures against any country found to be engaged in fishing for Atlantic bluefin tuna out of compliance with ICCAT measures. This is not true in other RFMO regions where managed species occur both within and outside the management area, making it more difficult for other RFMOs to determine if a catch can be deemed a product of IUU fishing. See Hayashi, *supra* note 54, p. 108.
58. Resolution by ICCAT Concerning the Unreported and Unregulated Catches of Tuna by Large-Scale Long-line Vessels in the Convention Area, Doc. Id. 98-18 (1998).
59. Ibid.
60. Recommendation by ICCAT Concerning the Ban on Landings & Transshipments of Vessels from Non-Contracting Parties Identified as Having Committed Serious Infringement, Doc. No. 98-11 (1998); Recommendation by ICCAT Regarding Belize, Cambodia, Honduras, and St. Vincent & the Grenadines Pursuant to the 1998 Resolution Concerning the Unreported and Unregulated Catches of Tuna by Large-Scale Long-line Vessels in the Convention Area, Doc No. 00-15 (2000); Recommendation by ICCAT Regarding Bolivia Pursuant to the 1998 Resolution Concerning the Unreported and Unregulated Catches of Tuna by Large-Scale Long-line Vessels in the Convention Area, Doc. No. 02-17 (2002); Recommendation by ICCAT for Trade Restrictive Measures on Sierra Leone, Doc. No. 02-19 (2002); Recommendation by ICCAT Concerning the Continuance of Trade Measures Against Equatorial Guinea, Doc. No. 03-17 (2003); Recommendation by ICCAT for Bigeye Tuna Trade Restrictive Measures on Georgia, Doc. No. 03-18 (2003).

ICCAT began its efforts to reduce fishing capacity in 1998, when it recommended all parties limit their number of bigeye tuna fishing vessels to the average number of those fishing in the period of 1991-1992, and that the vessel number should be limited by Gross Registered Tonnage (GRT) so that fishing capacity is not increased.⁶¹ At the 1999 annual ICCAT meeting, the problem of FOC fishing vessels was raised and discussed. Based on a prior decision, Japan and the United States submitted a list of FOC vessels to ICCAT, which became the official FOC list.⁶² Over 350 vessels were included on the list, of which eight non-contracting parties and three contracting parties were requested to eliminate FOC vessels-related activities.⁶³

ICCAT adopted new measures in 2002,⁶⁴ specifying that parties should take measures to ensure that (1) nationals or residents do not support or engage in IUU fishing and to identify those who are the operators or beneficial owners of IUU fishing vessels; (2) licensed fishing vessels have a prior authorization and obtain a validated Statistical Document prior to the transshipment; (3) transporters that intend to land species subject to the Statistical Document Programs have the necessary documents before transshipment; and (4) they provide the Commission with the names and other appropriate information of their transport vessels in such a manner as required for large-scale fishing vessels. It also recommended improving the current process for developing IUU vessel list and to consider the development of a “positive” vessel list.⁶⁵



Map 1.1 Global overview of RFMOs: Highly migratory species (Tuna and Tuna-like Stocks)

61. Recommendation by ICCAT on the Bigeye Tuna Conservation Measures for Fishing Vessels Larger than 24 m Length Overall (LOA), Doc. No. 98-3 (1998).
62. Ibid.
63. Ibid. The non-contracting parties were Belize, Cambodia, Honduras, Kenya, the Philippines, Sierra Leone, Singapore and St Vincent. The contracting parties were Equatorial Guinea, Guinea, and Trinidad and Tobago.
64. Namely Recommendation by ICCAT to Establish A List of Vessels Presumed to Have Carried Out Illegal, Unreported and Unregulated Fishing Activities in the ICCAT Convention Area, Doc. No. 02-23 (2002); Resolution by ICCAT Concerning the Measures to Prevent the Laundering of Catches by Illegal, Unreported and Unregulated (IUU) Large-Scale Tuna Long-line Fishing Vessels, Doc. No. 02-25 (2002), and Resolution by ICCAT Regarding Process and Criteria for ICCAT IUU Trade Restrictive Measures, Doc. No. 02-27 (2002).
65. See Report of the ICCAT Ad Hoc Working Group on Measures to Combat IUU Fishing, paras. 6.2, 7.2, 7.4, and 7.6.

Since 2002, ICCAT has increased its efforts to combat IUU fishing by adopting conservation and management measures that include: (1) compiling compliance tables that contain initial catch quotas, adjusted quotas and current catches; (2) establishing catch and landing databases that include estimates of IUU fishing activities, allocations of quotas, and catch limit; (3) requesting members to report trade and landing data of tuna and tuna-like species; (4) asking members to strengthen flag states control of their vessels; (5) strengthening integrated monitoring and transshipment controls; and (6) adopting statistical document programs for fishery resources under its management to assist in identifying fish and fish products that might have been caught in contravention of its conservation and management measures.⁶⁶ In March 2007, ICCAT, pursuant to the 2002 Recommendation,⁶⁷ prepared a list of vessels presumed to have carried out IUU fishing activities and made it available to the public on the ICCAT website.⁶⁸ In November 2007 at its 20th annual meeting, ICCAT adopted a recommendation that amended ICCAT List of Fishing Vessels Presumed to be Engaged in IUU Fishing Activities in the ICCAT Convention Area and Other Areas.⁶⁹ In addition, ICCAT adopted a document establishing a follow-up system and allowing for the traceability of catches throughout the market chain, in particular in order to better control and monitor the bluefin tuna fishery.⁷⁰

1.6 Japan's Push and Taiwan's Response at ICCAT Regarding IUU Fishing

Japan is one of the dominant distant-waters fishing nations (DWFN) in the global tuna fishery. It is also the largest consumer base for tuna in the world and is virtually the only nation that consumes tuna as *sashimi* and *sushi*⁷¹ as an inherent part of the Japanese food tradition and culture.⁷² It was reported that the annual consumption of tuna in Japan is between 400,000 and 500,000 tons,⁷³ and that the Japanese eat 80 per cent of the world's bluefin tuna.⁷⁴ Japan's large-scale tuna long-line fishing vessels (LSTLVs) capture approximately 200,000 tons of *sashimi* tuna annually,⁷⁵ on top of which, Japan imports around 270,000 tons of *sashimi* tuna, of which yellowfin tuna and bigeye tuna accounted for about 80 per cent of its total import volume.⁷⁶ About 10 per cent of the Japanese imported *sashimi* tuna were caught

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66. In 2002, ICCAT adopted Recommendation by ICCAT to Establish A List of Vessels Presumed to Have Carried Out Illegal, Unreported and Unregulated Fishing Activities in the ICCAT Convention Area (02-23), Resolution by ICCAT Concerning the Measures to Prevent the Laundering of Catches by Illegal, Unreported and Unregulated (IUU) Large-Scale Tuna Long-line Fishing Vessels (02-25), Resolution by ICCAT Concerning Cooperative Actions to Eliminate Illegal, Unreported and Unregulated Fishing Activities by Large-Scale Tuna Long-line Vessels (02-26) and Resolution by ICCAT Regarding Process and Criteria for ICCAT IUU Trade Restrictive Measures (02-27). In 2003, ICCAT adopted Recommendation by ICCAT to Adopt Additional Measures Against Illegal, Unreported and Unregulated (IUU) Fishing. In 2006, ICCAT adopted Recommendation by ICCAT Amending the Recommendation by ICCAT to Establish A List of Vessels Presumed to Have Carried Out Illegal, Unreported and Unregulated Fishing Activities in the ICCAT Convention Area. For these resolutions, visit the website of ICCAT at: <http://www.iccat.org/>
67. Recommendation by ICCAT to Establish A List of Vessels Presumed to Have Carried Out Illegal, Unreported and Unregulated Fishing Activities in the ICCAT Convention Area (02-23), 2002.
68. For the list, visit <http://www.iccat.org/IUU.htm>
69. See Recommendation by ICCAT Amending ICCAT's List of Fishing Vessels Presumed To Be Engaged In Illegal, Unreported and Unregulated (IUU) Fishing Activities In The ICCAT Convention Area And Other Areas (07-09), available at: http://www.iccat.es/Documents/2168_ATT_ENG.pdf (visited 1/13/2008)
70. See Recommendation BY ICCAT On An ICCAT Bluefin Tuna Catch Documentation Program (07-10), Ibid.
71. *Sashimi* is fresh tuna sliced into small pieces, dipped in soy sources and *wasabi* (Japanese horse radish) and consumed raw. *Sushi* is another popular Japanese method of eating raw tuna, in which raw tuna is put on top of cooked rice or rolled together with other ingredients in seaweed paper and then cut into pieces.
72. Yuichiro Harada, "Tuning Tuna: tuna labeling," *SAMUDRA Report* (Tri-annual Report of International Collection in Support of Fishworkers, ICSF), No. 33, November 2002, p. 32, available at: <http://www.icsf.net/jsp/english/pubPages/samudra/index.jsp#show>
73. "AM – Japan fears tuna shortage," ABC Online, May 29, 2007, available at: <http://www.abc.net.au/am/content/2007/s1936028.htm>
74. "Tuna stocks sink," Marine and Ocean Conservation News from Earthdive, January 23, 2007, available at: <http://www.earthdive.com/site/news/newsdetail.asp?id=1985>
75. "Comment: A label for tuna?," 33 *Samudra* 1 (Nov. 2002), available at: http://www.icsf.net/icsf2006/uploads/publications/samudra/pdf/english/issue_33/edit.pdf
76. "Tuna: The Japanese Market," Pacific Islands Centre, available at: <http://www.pic.or.jp/en/market/tuna.htm> (visited October 22, 2007)

by IUU large-scale tuna long-line fishing vessels.⁷⁷

The tuna RFMOs have allocated to Japan a substantial proportion of the tuna long-line catch in many areas of the world. For example, Japan's annual long-line catch quota for bigeye tuna in the Eastern Pacific Ocean during 2004, 2005, 2006 was set at 34,076 tons, in comparison with China's 2,639 tons, Korea's 12,576 tons, and Taiwan's 7,953 tons.⁷⁸ For 2004-2005, Japan was allocated 6,065 tons out of the total allowable catch (TAC) of 14,930 tons set by CCSBT, in comparison with Australia's 5,265 tons, South Korea's 1,140 tons, and Taiwan's 1,140 tons.⁷⁹ Table 1.2 shows Japan's and Taiwan's allocation of tuna stocks under the management regime of ICCAT.

Table 1.2 Japan's and Taiwan's total tuna catch Allocation at ICCAT (In tons, 2003-2006)

	2003		2004		2005		2006	
	Japan	Taiwan	Japan	Taiwan	Japan	Taiwan	Japan	Taiwan
Tuna Stocks								
ICCAT (Southern Atlantic Swordfish)	1,500	925	1,500	825	1,500	780	1,500	720
ICCAT (Northern Atlantic Swordfish)	835	310	842	310	842	310	842	310
ICCAT (Western Atlantic Bluefin tuna)	478.25	No quota	478.25	No quota	478.25	No quota	478.25	No quota
ICCAT (Eastern Atlantic & Mediterranean Bluefin tuna)	2,949	827	2,930	382	2,890	331	2,830	480
ICCAT (Bigeye)	32,539	16,500	32,539	16,500	27,000	14,900	26,000	4,600
ICCAT (Northern Atlantic Albacore)	756	4,453	756	4,453	639	4,453	657	4,453

Source Tabulated by the author based on ICCAT Recommendation 02-03 (2002); ICCAT Recommendation 02-02 (2002); ICCAT Recommendation 02-07 (2002); ICCAT Recommendation 02-08 (2002); ICCAT Recommendation 04-01 (2004); ICCAT Recommendation 03-06 (2003); and the Information provided by the Fisheries Administration, Council of Agriculture, Taiwan.

While Japan's tuna fleet has been very active in ocean areas under management of the five tuna RFMOs, namely, ICCAT, IATTC, IOTC, CCSBT, and WCPFC, a decline has been seen in the Japanese tuna fishing industry since the middle of the 1980s, and increasingly in the 1990s, because of rising competition from Taiwan, Korea, and other distant-water fishing fleets; and also because of soaring labor and fuel costs, declining catch rates, and shortage of labor supply.⁸⁰ It may be that this decline in the size of the Japanese tuna fishing sector and the increasing competition from other distant water fishing nations paved the way for Japan to play an active role in addressing the problem of IUU fishing, which was reflected in a series of actions taken by Japan, in particular, at ICCAT, Organization for Economic Co-operation and Development (OECD), and WCPFC meetings to accuse Taiwan of conducting IUU fishing activities, and to demand that Taiwan reduce its tuna fishing fleet and adopt stricter conservation and management

77. "Comment: A label for tuna?" *supra* note 75, p. 1.

78. Resolution for A Multi-annual Program on the Conservation of Tuna in the Eastern Pacific Ocean for 2004, 2005 and 2006, IATTC 72nd meeting, Resolution C-04-09 (June 14-18, 2004).

79. See Commission for the Conservation of Southern Bluefin Tuna – Management of SBT, Catch levels, <http://www/ccsbt.org/docs/management.html>

80. See Makoto Peter Miyake, *Extracts from "Brief Review of World Tuna Fisheries," SCTB17 Working Paper, INF-FTWG-1a*, p. 8, 17th Meeting of the Standing Committee on Tuna and Billfish, Aug. 9-18, 2004, Majuro, Republic of Marshall Islands (2004); see also Seiichiro Ono, *Development of the Japanese tuna fisheries: after the reduction in the number of fishing vessels (GENSEN) in 1998, in 2004: What are Responsible Fisheries?* Proceedings of the Twelfth Biennial Conference of the International Institute of Fisheries Economics & Trade (IIFET), July 20-30, 2004, Tokyo, Japan (Yoshiaki Matsuda & Tadashi Yamamoto eds., 2004).

measures.

Taiwan, like Japan, is a dominant distant-water-fishing-nation and has one of the largest tuna fleet in the world. In 1985, it had only 75 LSTLVs, in comparison with South Korea’s 200 and Japan’s 773.⁸¹ By 1999, Taiwan’s tuna long-line vessels increased to 553, together with about 210 FOC tuna long-line vessels. However, the size of the Japanese tuna long-line fleet had shrunk to 528, as a result of a voluntarily cut in 1998/1999 of 130 long-line vessels in accordance with the policy enunciated in the IPOA-Capacity document.⁸² Major reasons for the rapid growth of Taiwan’s LSTLVs include the export of the Japanese second-handed tuna long-line vessels to Taiwan, the increasing demand with good price in the Japanese market for tuna, and a relaxation Taiwan’s restrictions on new vessel construction in 1988 which had allowed the construction of new long-line and purse seine vessels over 700 GRT class.⁸³ It is against this background that in the 1990s, Japan exported about 130 second-handed large-scale LSTLVs and Taiwan built and exported about 110 LSTLVs. Most of these vessels were registered in countries with open registry system such as Belize, Cambodia, Honduras and Equatorial Guinea; and thereafter, these vessels became the main source of IUU/FOC fishing activities conducted in different areas of the world’s oceans. By 2005, Taiwan’s tuna fishing fleet grew to a size of 614 long-line tuna fishing vessels over 100 GRT, 1,300 long-line tuna fishing vessels under 100 GRT, and 33 large tuna purse-seine vessels. (See Table 1.3)

Taiwan exports tuna mainly to Japan, because of historical and geographical reasons, the traditional Japan-Taiwan fishery relations,⁸⁴ and more importantly, the high demand and high selling price of tuna in the Japanese *sashimi* market. In 1994, under pressure from the Japanese tuna industry, Taiwan agreed to limit its frozen tuna exports to Japan to no more than 99,000 tons a year. But trade records show that Taiwan’s tuna exporting industry exceeded those

Table 1.3 Taiwan’s distant-water-fishing fleet (2005)

Main Fishing Methods	Number of Vessels	Operation Areas	Species
	614		
Long-line	Over 100 GRT	Open-Indian Ocean: 337; Atlantic Ocean: 144; Pacific Ocean: 133	Bigeye 464; Alba core 150 Conducting fishing activities in Pacific, Indian, and Atlantic Oceans Tuna and Tuna-like species
Large-scale skipjack/tuna purse-seine vessels	33	Around 1,300	Conducting fishing activities mainly in waters near the Philippines, Indonesia, Palau, Guam, South Pacific and Eastern Indian Ocean Conducting fishing activities in Western and Central Pacific Ocean Tuna and tuna-like species

Source “On the Most Optimal Scale of Distant Water Fishery and Management,” power-point presentation by Tsai Tzy Yao, Division Chief, Fisheries Administration, at the Symposium on General Examination of Taiwan’s Fishing Policy (V), held on July 22, 2005 in Taipei, Taiwan (in Chinese, translated by this author.)

81. See Gunchi Satanoli, “It Is No Longer Easy to Eat Todo Sashimi,” in *Bungeishunju* (文藝春秋), p. 338; See also *Forty Years of Taiwan’s Fisheries: Special Volume*, Council of Agriculture, the Executive Yuan, Taiwan, R.O.C., 1993, p. 47.

82. Ibid, Satanoli, p. 338.

83. See *Forty Years of Taiwan’s Fisheries: Special Volume*, published by Council of Agriculture, the Executive Yuan, 1993, p. 24.

84. It should be recalled that Taiwan was under Japan’s occupation as a colony between 1895 and 1945; hence development of Taiwan’s fishery had been influenced profoundly by the Japanese fishing industry.

limits. In 2004, for instance, Taiwan exported 127,000 tons of frozen tuna to Japan.⁸⁵ At the 2004 meeting of the ICCAT, Japan accused the Taiwanese tuna fleets of conducting laundering activities by disguising Atlantic bigeye as Indian bigeye. The laundered amount of Atlantic bigeye was estimated at between 9,750 and 16,000 tons.⁸⁶

Japan started to vocalize its concerns about IUU fishing activities conducted by Taiwan's fishermen at the 2000 ICCAT meeting, where Japan reported that many of the owners of IUU vessels, most of whom are Taiwanese residents, changed flags and names of vessels and owner companies or concluded charter contracts to escape from the Japan-Taiwan joint program for elimination of IUU vessels.⁸⁷ Since the adoption of the IPOA-IUU in June 2001, Japan has become more active at global and regional fisheries meetings, urging the Taiwanese government to take more actions to deal with the problem of IUU/FOC tuna fishing vessels that are owned or operated by Taiwan's nationals. In May 2002, Japan hosted the ICCAT Ad Hoc Working Group Meeting on Measures to Combat IUU, in which the participants reached agreement that the efforts taken by ICCAT to deal with IUU fishing activities should be improved by the adoption of new measures.⁸⁸

In March 2003, the Japanese delegation participating in the meeting of FAO's Committee on Fisheries (COFI) proposed that the organization hold an intergovernmental meeting to step up the implementation of the IPOA-Capacity and IPOA-IUU. Japan provided financial support for this intergovernmental meeting that was held in June 2004 in Rome.⁸⁹ At the technical consultation meeting to review progress and promote the full implementation of the IPOA-IUU and IPOA-Capacity, the Japanese delegation made a presentation, pointing out that while international efforts to eliminate LSTLVs engaged in IUU fishing had resulted in a substantial reduction in the number of such vessels fishing since 2001, the cessation of construction of LSTLVs in Taiwan had led to an increase in the construction of large-scale Taiwanese tuna purse seine vessels, which are destined for operations in the western and central Pacific Ocean.⁹⁰ The Fisheries Agency of Japan made the same accusation against Taiwan at the Technical Consultation to Review Progress and Promote the Full Implementation of the IPOA-IUU and the IPOA-Capacity, held in Rome, Italy, June 24-29, 2004. It also presented six proposed actions to help eliminate IUU fishing, which are similar to the proposed actions made at the OECD IUU Workshop.⁹¹

Before attaining the status of Co-operating non-Contracting Party, Entity or Fishing Entity in ICCAT, Taiwan had already been asked to take remedial action to reduce IUU fishing. In a resolution adopted by ICCAT in 1999, Taiwan was urged to scrap Japanese-built vessels engaged in IUU fishing in the Convention Area and other areas.⁹² At the 2000 ICCAT meeting, two supplemental resolutions focused on Japan and Taiwan's role in IUU fishing. ICCAT continued pressuring Taiwan and Japan to "take every possible action" to halt IUU fishing.⁹³ The supplemental resolution (00-19) stated that "a substantial number of owners of IUU large-scale long-line vessels, most of whom

85. Wu Kuo Chin, excerpt of translation (in Chinese), *A Brief Summary of the Outcomes of Japan-Taiwan Negotiation Meeting over Fisheries Issues* (March 15, 2005), available at <http://www.tuna.org.tw>.

86. See Japan Information Paper on activities by Chinese Taipei Fishing Vessels and Industry in the Atlantic Ocean, in ICCAT Report 2004-2005 (II), available at: http://www.iccat.org/Documents/BienRep/REP_EN_04-05_II_1.pdf, p. 256.

87. Information Presented by Japan on the Recent Activities of Large-scale Tuna Long-line Vessels Based on Japanese Trade Data, in ICCAT Report 2000-2001 (1), pp. 268-272.

88. Report of the ICCAT Ad Hoc Working Group on Measures to Combat IUU Fishing, Tokyo, Japan, May 27-30, 2002, in ICCAT Report for biennial period, 2002-03, Part (2002), Vol. 1, 2003, Annex 5, pp. 97-102.

89. "Strong support for firmer action against IUU fishing," in FAO Newsroom, March 3, 2003, available at: <http://www.fao.org/giii/english/newsroom/news/2003/14660-en.html>

90. See paragraph 9 of the Report of Technical Consultation to Review Progress and Promote the Full Implementation of the International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing and the International Plan of Action for the Management of Fishing Capacity, Rome June 24-29, 2004, available at: http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/007/y5681e/y5681e00.htm

91. David Chang, *Measures Taken by Taiwan in Combating FOC/IUU Fishing*, OECD Workshop on IUU Fishing (April 19-20, 2004).

92. Resolution by ICCAT Calling for Further Actions Against Illegal, Unregulated, and Unreported Fishing Activities by Large-Scale Long-line vessels in the Convention Area and Other Areas (transmitted to Contracting Parties on December 16, 1999), available at: http://www.iccat.int/Recs_RegsResults.asp?selectYear=1999, para. 4.

93. Supplemental Resolution by ICCAT Concerning the Recommendation on the Bigeye Tuna Conservation Measures, Doc. 00-02 (2000) and Supplemental Resolution by ICCAT to Enhance the Effectiveness of the ICCAT Measures to Eliminate Illegal, Unregulated and Unreported Fishing Activities by Large-Scale Tuna Long-line Vessels in the Convention Area and Other Areas (00-19) (Transmitted to Contracting Parties on December 27, 2000). These two resolutions are available at: <http://www.iccat.int/RecsRegsResults.asp?selectYear=2000>

are Chinese Taipei's business entities, are still trying to continue IUU fishing by changing the flag of the vessels and vessel name and/or ownership."⁹⁴ It urged Japan and Taiwan to scrap IUU fishing vessels built in Japan and owned and flagged elsewhere and to re-register Taiwanese-built and owned FOC vessels back to Taiwan.⁹⁵ As noted earlier, ICCAT adopted new measures in 2002 to combat IUU fishing. It also recommended improving the current process for developing IUU vessel list and to consider the development of a "positive" vessel list.⁹⁶

In a meeting of ICCAT held in November 2004, Japan and other nations explicitly accused Taiwanese-owned FOC vessels of taking unreported tuna catches, and Taiwanese flag vessels of landing fish in excess of quotas and of prohibited size or age; Taiwan's exports to Japan exceeded the entire volume of the Taiwan quota under ICCAT management.⁹⁷ In response, Taiwan promised that it would strengthen management and deduct 1,600 tons annually between 2005 and 2009 to make up for the 8,000 tons previously fished in excess of its quota,⁹⁸ and ICCAT agreed to give Taiwan one year's probation and continue to give it a quota pending a review the next year, and holding out the threat of trade sanctions if Taiwan did not take effective action against violations.⁹⁹

At the 2005 meeting of ICCAT, Japan pointed out that:

. . . this Chinese Taipei problem is not a problem of one year. Over ten years Japan strenuously worked to eliminate IUU fishing by tuna long-line vessels. The Commission acknowledged our effort and extended assistance to this effort. The IUU list and positive listing measures are good examples of the Commission's actions for this purpose. However, the Chinese Taipei fishing industry always found loopholes and backdoors of those measures and tenaciously continued in innovative and changing ways, their over-fishing, excessive fishing capacity building and involvement in IUU fishing. In our firm belief, Chinese Taipei fishermen are continuing laundering activities and depleting tuna and tuna-like resources by excessive and illegal exploitation. It is time to take decisive action on this long-standing problem. To wait and see is not an option this year.¹⁰⁰

In response to the Japanese accusation, Taiwan stated that it had done its utmost to rectify the deficiency of its fisheries management, MCS, and reduction of vessels commensurate with fishing quota of bigeye tuna. It had made all efforts to convince high-level administration to squeeze budget to undertake a vessel reduction program of 120 large-scale tuna long-line fishing vessel in 2006-2006, and to enhance measures on the management of fisheries. In addition, Taiwan cited the following fisheries management measures it had taken in support of its effort to combat IUU fishing:

- In order to cut any linkage between the legitimate licensed long-line fishing vessels and the IUU fishing vessels such that the statistical document issued to the legitimate licensed vessels would not be used by the IUU vessels, to those ocean areas under the competence of IOTC and WCPFC, which have not yet adopted quota allocation, Chinese Taipei has made a self-restraint on the fishing activities of its fleet by applying individual quota to fishing vessels;
- To prevent expansion of global fishing capacity, before adoption of such measures by RFMOs, regulations have been promulgated to prohibit exportation of fishing vessels unless replacement of scrapped or lost vessels as declared by the importing countries or at the approval of the relevant RFMOs;
- In order to combat IUU fishing vessels, only those vessels on the positive list of RFMOs are permitted to enter

94. Supplemental Resolution (00-19), 2000, Ibid.

95. Ibid, para. 1.

96. See Report of the ICCAT Ad Hoc Working Group on Measures to Combat IUU Fishing, (Tokyo, Japan, 2002), paras. 6.2, 7.2, 7.4, and 7.6.

97. *Government to Abide by ICCAT Order to Slash Bigeye Tuna Catch*, 24 *Taiwan Jnl* .No 23 (June 15, 2007)

98. It was believed that Taiwan overfished 8,000 tons in 2004 and therefore was required deduct 1,600 tons of its national quota annually, beginning in 2005, and ending in 2009, to return the overfished amount of tuna.

99. See BBC Monitoring International Reports, Nov. 26, 2005. Following the 2004 meeting, Japan's Ministry of Agriculture, Forestry and Fisheries reported that "Chinese Taipei [Taiwan] and China were severely criticized by other participating parties and as a result both accepted that they would compensate for the excessive catch by accepting reductions in their future catch limits." MAFF, *Annual Meeting (the 14th Special Meeting) of the International Commission for the Conservation of Atlantic Tuna (ICCAT) Held*, MAFF Update No. 571 (Dec. 17, 2004), available at <http://www.maff.go.jp/mud/571.htm>.

100. See the Japanese opening statements at the 2005 meeting of ICCAT, in Addresses & Statement, ICCAT REPORT 2004-2005(II), available at http://www.iccat.org/Documents/BienRep/REP_EN_04-05_II_1.pdf, pp. 89-90.

into the ports of Chinese Taipei.¹⁰¹

Despite the effort taken by Taiwan to explain the measures it had taken to improve fisheries management and to deal with the problem of IUU fishing, the Recommendation by ICCAT Regarding Control of Chinese Taipei's Atlantic Bigeye Tuna Fishery (05-02) was still adopted at the 2005 ICCAT meeting, which cut Taiwan's allowable catch of bigeye tuna from 14,900 tons in 2005 to 4,600 tons for 2006 to stem overfishing in the Atlantic Ocean and the Mediterranean.¹⁰² In addition, ICCAT decided that of Taiwan's 60 bigeye tuna fishing vessels, only 15 would be allowed to continue operations in the Atlantic Ocean in 2006. The list of these 15 vessels and their individual vessel quota of 220 tons should be notified to the Commission by December 20, 2005.¹⁰³ These vessels were also subject to the following strict monitoring and enforcement measures:

- No at-sea transshipment is permitted for these 15 vessels and their catch must be transhipped or landed at two designated ports (Cape Town and Las Palmas);
- The vessels shall visit one of these ports every three months, where they will be subject to mandatory port inspection by Chinese Taipei officers and port state officials. The inspection reports shall be transmitted to ICCAT at the latest one week after the inspection;
- Daily catch reporting to Chinese Taipei authorities, by VMS or radio;
- Chinese Taipei authorities will send a quarterly catch report to ICCAT;
- One the individual vessel quota of 200 tons is exhausted, the vessel must return to its home port;
- 100% compliance observer coverage will be ensured in the entire targeted fishing campaign.¹⁰⁴

Moreover, Taiwan should comply with the conditions set out in the attachment to the recommendation (05-02), which required Taiwan to scrap an additional 40 vessels (greater than 24 meters) from its tuna fleet, to report to ICCAT on the vessels (between 20 and 24 meters) fishing for tuna and other highly migratory species, by ocean, under Taiwan's flag and foreign flags owned or controlled by Taiwanese businesses, to submit quarterly progress reports to ICCAT on the process of implantation of the above-mentioned programs, to expand port inspection and sampling programs, to increase observer coverage, to extend the VMS requirement to all vessels 20 meters or greater in length, and to ensure that its data reported consistent with ICCAT rule.¹⁰⁵ The attachment also asked Taiwan to control IUU fishing by vessels of any size that fish for ICCAT species in the Atlantic Ocean by taking the following measures:

- Thoroughly investigating alleged 2003, 2004 and 2005 laundering activities by its flag vessels, taking appropriate enforcement actions, and submitting a complete report of the investigations and resulting actions to ICCAT by July 1, 2006;
- Identify foreign flagged vessels owned or controlled by [Chinese Taipei] business and submitting to ICCAT by July 1, 2006, a comprehensively report on each such vessel, including a description of the nature of the economic and beneficial relations between such [Chinese Taipei] business interests and the vessel;
- Taking effective steps, including meaningful enforcement measures with respect to [Chinese Taipei] flag vessels and [Chinese Taipei] business interest that own foreign flag vessels, to eliminate IUU fishing activities through, at a minimum:
 - Cutting beneficial and financial relations with IUU operators;
 - Working with the respective flag countries, to the extent practicable, to improve monitoring and control of vessels and stopping foreign flagged vessels owned by [Chinese Taipei] business interests from exporting under the name of [Chinese Taipei].¹⁰⁶

Taiwan was also asked to submit quarterly report to ICCAT on the progress made in implementing these and other

101. See Opening Statements by Cooperating Non-Contracting Parties, Entities or Fishing Entities – Chinese Taipei, in ICCAT REPORT 2004-2005(II), *Ibid.*, pp. 95-96.

102. Recommendation by ICCAT Regarding Control of Chinese Taipei's Atlantic Bigeye Tuna Fishery, in Recommendations Adopted in 2005 (05-02), para. 1. The text of the recommendation is available in ICCAT REPORT 2004-2005(II), *Ibid.*, pp. 157-158.

103. Para. 2. *Ibid.*

104. *Ibid.*

105. See Attachment to the Recommendation by ICCAT Regarding Control of 'Chinese Taipei's Atlantic Bigeye Tuna Fishery, in ICCAT REPORT 2004-2005(II), *Ibid.*, pp. 158-159.

106. *Ibid.*

steps to eliminate IUU fishing.¹⁰⁷

The Recommendation (05-02) indeed contains very detailed and specific conditions, which in many aspects go beyond current standards of the conservation and management measures adopted by ICCAT. The time given by ICCAT to Taiwan for improving its fisheries management and dealing with the problem of IUU fishing was also very short, relatively speaking less than 12 months. However, Japan was not satisfied with the conditions set in the Recommendation (05-02), as shown in the following closing statements made by Japan at the plenary sessions of the 2005 meeting: “This proposal is far less than what Japan wished to see. According to the proposal, we will have to wait another full year to ensure total rejection of the recurrence of IUU operations by Chinese Taipei. The proposal does allow Chinese Taipei to continue its bigeye fishery in the Convention area in 2006. This makes market States continue to confront risks of import of illegally caught bigeye.”¹⁰⁸ Japan was of the opinion that the recommendation established a precedent and clearly adversely affected the future ability of ICCAT to take effective counter measures against IUU fishing. Japan also made it clear that it will continue to be keen on how Taiwan will fulfill its obligation set forth in the recommendation. At the same time, Japan promised to fulfill its responsibility not to import illegally caught tuna.¹⁰⁹

1.7 Changes of Taiwan’s Tuna Fisheries Management Policy

In 1999, Japan and Taiwan entered into a joint action plan in cooperation to eliminate IUU fishing vessels.¹¹⁰ Under the plan, for large scale tuna long-line vessels, Taiwan agreed to maintain continuously its policy of vessel replacement after decomposition and implementation of vessels building restriction measures. In addition, Taiwan set the tentative goal of reducing 60 large scale long-line vessels by the end of 2000 as the initial stage of its fleet reduction program. Taiwan also agreed to start preparations for repatriation to Taiwan of those FOC vessels built in Taiwan in line with the results of the actions taken by Japan under paragraph 2a and 2c of the Japanese action plan.

Japan agreed to reduce its licensed large scale tuna long-line vessel by approximately 20%, namely 132 vessels. This was the same commitment made by Japan to the FAO in February 1999. Japan promised to take the necessary measures to freeze the approved permits for operation of tuna long-line vessels so as not to increase the number of its licensed large-scale tuna long-line vessels. At the same time, Japan urged Taiwan to take necessary measures to control the total fishing capacity of large scale tuna long-line vessels effectively. By June 1999, Japan would, in consultation and cooperation with Taiwan, work out a series of specific countermeasures to cope with the FOC problems. In the review of the performance in 2003, however, 44 vessels escaped the Japanese scrapping program and two vessels built in Taiwan escaped the re-registration program. As a result, a new Japan-Taiwan action plan was concluded in 2003.¹¹¹

In accordance with the new plan, Taiwan agreed to take necessary measures to intensify the control of its residents that invest in or otherwise support or engage in IUU fishing. The measures to be taken by Taiwan include: requiring its residents to acquire prior authorization to operate tuna fisheries on the high seas; restricting export of large-scale tuna long-line fishing vessels to those countries which have been identified as having involved in IUU fishing activities; denying access of IUU fishing vessels to Taiwanese ports; and imposing sanctions, if necessary and appropriate, to violators of fish laundering, in accordance with applicable law. Japan promised to promote scrapping of the remaining IUU large-scale tuna long-line vessels built in Japan, but owned and/or operated by Taiwanese residents for completion before the end of 2003. Taiwan pledged to promote re-registration for completion by the end of 2004 of those IUU large-scale tuna long-line vessels built in Taiwan to its registry, while maintaining the policy of the vessels replacement. Both Taiwan and Japan cooperated in the smooth implementation of legalization of the IUU large-scale tuna long-line vessels of Seychelles and Vanuatu flags. Japan agreed to take necessary measures to intensify the control of its residents and request its residents not to render assistance to the activities of IUU fishing. These measures

107. Ibid.

108. Closing Statements to the Plenary Sessions, Japan concerning the Adoption of Recommendation 05-02, ICCAT REPORT 2004-2005(II), Ibid., p. 98.

109. Ibid.

110. The Action Plan encompasses two parts: the Taiwanese Action Plan and the Japanese Action Plan. A copy of the Action Plan is on file with Yann-Huei Song.

111. A copy of the new joint action plan is on file with Yann-huei Song.

include: denying access of IUU fishing vessels to Japanese ports; requesting its fish importers and transporters not to buy and receive fish caught by IUU large-scale tuna long-line vessels or to assist in fish laundering; restricting the export of second-handed large-scale tuna long-line vessels to those countries which have been identified as involved with IUU fishing activities; urging its residents to prevent their engines and machinery from being used for IUU fishing; and imposing sanctions, if necessary and appropriate, on its residents who have been proven to having involved in fish laundering, according to the applicable law. Also both Taiwan and Japan pledged to undertake the following cooperative efforts:

- Cooperate in taking necessary measures and frequent exchange of information to monitor transshipment of tuna catches in order to prevent and eliminate IUU fishing activities and to prevent laundering of fish caught by IUU fishing vessels through legitimate licensed fishing vessels with the assistance of fish transporters and importers;
- Cooperate in smooth implementation of positive listing scheme, based upon the lists to be presented by the Taiwanese side to the relevant RFMOs and/or the Japanese side;
- Strengthen cooperation in international affairs in global, regional and sub-regional level, including pre-meetings before the annual meetings of FAO and relevant RFMOs;
- Monitor and assist, if appropriate, the work of OPRT [the Promotion of Responsible Tuna Fisheries] to facilitate its goals and objectives;
- Exchange information on tuna fisheries research and relevant scientific reports and publications;
- Promote tuna marketing and build the labeling system for tuna and tuna-like species.¹¹²

Despite the conclusion of these two action plans between Japan and Taiwan in 1999 and 2003, respectively, there was no further development since. Japan continued to push Taiwan to act to eliminate the remaining IUU fishing vessels at different RFMOs and relevant international meetings.

Japan's effort taken at ICCAT and other international fisheries bodies and organizations over the past five years (2001-2005) to push Taiwan to take effective measures to reduce the number of its tuna fishing vessels and eliminate IUU fishing should be considered one of the major external policy input variables that affected profoundly the policy making of Taiwan in the management of tuna fishing fleet and dealing with the problem of IUU fishing. There is no doubt that Japan has played a very important role in the adoption of ICCAT Recommendation (05-02) in 2005. Ironically, however, it was concluded at the 13th CCSBT meeting that Japan had been overfishing southern bluefin (SBT) for years. As a result, Japan's SBT quota of 6,065 metric tons in 2006 was cut to 3,000 metric tons in 2007-2009.¹¹³

In response to pressure from Japan and the international community, Taiwan is in the process of restructuring its tuna fisheries policy and improving the fishery conservation and management system. New fisheries management regulations have thus been enacted. In June 2005, regulations were promulgated to prohibit the export of fishing vessels unless for the replacement of sunk or lost vessels as declared by the importing countries or at the approval of the relevant RFMO, to prevent increase of global fishing capacity.¹¹⁴ Mainly because of the regulations, two new large-scale skipjack/tuna purse-seine vessels (1,200 GRT) that were built by Koo Kuan-min, a former senior president adviser and prominent businessman in Taiwan's fishing industry, two years ago were not allowed to be exported to the Marshall Islands. The Taiwanese authority rejected the application for export licenses submitted by Koo mainly because the regional tuna fishing organization in the South Pacific refused to grant new licenses under the existing quota system adopted to avoid overfishing of tuna stocks.¹¹⁵ In addition, a new legislation was drafted in 2007 and was sent to the Legislative Yuan for deliberation in May 2007,¹¹⁶ which if passed, would require nationals of Taiwan who intend to operate foreign-flagged vessels to acquire prior approval from the government. The purpose of this legislation is to

112. Ibid.

113. Japan Fishery Products, Japan's Annual Southern Bluefin Tuna Catch Halved 2006, USDA Foreign Agricultural Service, *Gain Report* No. JA6056, October 25, 2006, available at: <http://www.fas.usda.gov/gainfiles/200610/146249374.pdf>

114. Regulations for Issuing Fishing Vessels Construction Permit and Fishery Licenses, promulgated by the Fishery Agency, Council of Agriculture, the Executive Yuan (the Cabinet), June 29, 2005. For the regulations, visit the website of Fishery Agency at: <http://www.fa.gov.tw/chn/fshlaw/LawObject.php?Class=FishWork&Group=Law&LimitRow=20> (in Chinese). The regulations were amended on March 21, 2007.

115. "Activist Koo denies 'selling out Taiwan'," *China Post*, October 19, 2007, p. 16.

116. See "The Decision Made by the Prime Minister regarding the Management Regulations on Investment in Operations of Non-National Fishing Vessels," May 2, 2007, available at: <http://www.gio.gov.tw/ct.asp?xItem=33092&ctNode=919>

eliminate IUU/FOC fishing vessels by cutting beneficial and financial relations with IUU operators.¹¹⁷

In addition, a number of actions have been taken by Taiwan to improve its fishery management and the scrapping of large-scale tuna long-line fishing vessels since 2005. The following fishery management measures were taken by Taiwan in 2005: strict verification and issuance of Statistical Documents, individual quota, improved VMS, monitor transshipment, placing of observers, implementing a vessel reduction program. By the end of 2005, 120 large-scale tuna fishing vessels were scrapped. This was followed by another cut of 40 large-scale tuna fishing vessels in 2006. In total, the Taiwanese government and fishing industry spent about US\$ 200 million reducing the 160 LSTLVs by buying back the vessels and their licenses for scrapping or sinking for use as artificial reef by the end of 2006.¹¹⁸ In addition, the Taiwanese government has approved allocation of US\$ 113 million for a six-year program and creation of eight new posts of fisheries officers for the follow up of the management of long-distant-water fisheries. This includes the restructuring of Taiwan's long-line tuna fishery with a further reduction of 16 LSTLVs in 2007 that are operating in the Pacific and Indian Oceans.¹¹⁹ In addition to reduction of the number of large-scale tuna long-line fishing vessels, the Taiwan government has taken a number of policy measures to ensure the size of its fishing fleet is commensurate with the catch quotas allocated by RFMOs and to prevent operators from conducting IUU fishing activities, which include: (1) grouping of fishing vessels by fishing areas and target species; (2) enhancement in the control of catch; (3) strengthening the collection of catch information, the coverage of scientific observer, and port sampling; (4) strict control of the issuing of catch statistical documents; (5) drafting new regulations for investigating FOC fishing vessels owned by Taiwan nationals or IUU fishing activities conducted by Taiwan nationals and imposing severe punishment against offenders; and (6) strengthening the management of small and medium-scale tuna long-line vessels of less than 24 meter in length.¹²⁰

At the 2006 ICCAT meeting, acknowledging with satisfaction that Taiwan has met the conditions set out in the Recommendation by ICCAT Regarding Control of Chinese Taipei's Atlantic Bigeye Tuna Fishery (05-02) to cooperate with ICCAT in the conservation and management of tuna and tuna-like species by carrying out the requested measures, such as extensive reduction in the number of long-line tuna fishing vessels, and has made significant progress in rectifying the situation that Recommendation 05-02 was designed to address, a new Recommendation (06-01) was adopted to replace the 2005 ICCAT Recommendation (05-02).¹²¹ As a result, the 2004 ICCAT Recommendation 04-01 was resumed to apply to Taiwan, which means that Taiwan's bigeye quota was restored to 16,500 metric tons in 2007 and 2009.¹²² However, Taiwan should limit the number of vessels under its registry authorized to conduct a directed fishery for bigeye tuna in the Convention area no more than 64 in 2007, and 60 in 2008 and thereafter.¹²³ In addition, Taiwan should adopt the following monitoring and enforcement measures:

- The vessels shall submit daily catch reports to Chinese Taipei authorities, by VMS or radio;
- These vessels shall only conduct fishing operations for bigeye tuna if they are in possession of available individual quota;
- Chinese Taipei authorities will send a preliminary catch report to ICCAT on a semi-annual basis;
- Chinese Taipei shall ensure 10% observer coverage by vessels in the entire fishery.¹²⁴

Moreover, Taiwan is continuously asked by ICCAT to take effective steps to eliminate IUU fishing activities that are

117. "It is not convenient anymore to invest FOC vessels," *New Fishery*, May 25, 2007, pp. 4-9 (in Chinese). The text of the draft is on file of the author.

118. Opening Statements by Cooperating Non-Contracting parties, Entities or Fishing Entities, Chinese Taipei at the 2006 ICCAT meeting. See ICCAT REPORT 2006-2007 (1), available at: http://www.iccat.org/Documents/BienRep/REP_EN_06-07_I_1.pdf, p. 60.

119. *Ibid.*

120. "New Image for Taiwan's Far Seas Tuna Long-line Fishery," in the website of Fishery Administration, Taiwan, at: <http://www.fa.gov.tw/eng/media/text/nitfstuna.text>

121. Recommendation by ICCAT Regarding Chinese Taipei (06-01), adopted at the 2006 ICCAT meeting, available in Recommendations Adopted in 2006, ICCAT REPORT 2006-2007 (I), pp. 65-66.

122. Actually it should be 14,900 metric tons. after deduction of 1,600 metric tons annually between 2005-2009. The over-harvest of Taiwan of 8,000 metric tons in 2003 results in a yearly deduction of 1,600 metric tons from their annual catch limit in the period of 2005-2009. See Recommendation by ICCAT on A Multi-Year Conservation and Management Program for Bigeye Tuna (04-01), adopted at the 2004 ICCAT meeting, page. 4 and 5.

123. Recommendation by ICCAT Regarding Chinese Taipei (06-01), para. 1.

124. *Ibid.*, para. 2.

conducted by residents and business entities of Taiwan and by vessels registered to Taiwan.¹²⁵

In September 2007, to help strengthen the long-distant-water fishery management, the Taiwan government is implementing a specific fishing vessel buy-back program, which aims to re-adjust fishing structures and develop a proper fishing capacity. Since some of Taiwan's trawler fishing vessels over 100 GRT switch to long-line tuna fishery without government authorization and therefore are considered IUU fishing vessels, these vessels will be purchased by the government under the program at a cost of NT\$4.1 million per vessel (100 GRT) and NT\$5.9 million per vessel (over 200 GRT). In addition, to help reduce the number of small-scale, long-line tuna fishing vessels, these vessels can also be bought back by the government under the program.¹²⁶

1.8 Evaluation of the Effectiveness of the ICCAT Efforts to Combat IUU Fishing

ICCAT has been criticized for being unable to take adequate efforts to conserve and manage tuna resources in the ocean areas subject to its regulatory power.¹²⁷ WWF once termed the ICCAT quota system "little more than a political tool, hiding practices of tuna fishing, shipping, processing, and trading that violate existing rules."¹²⁸ The same organization points out that ICCAT has failed to adopt the precautionary approach and has been slow to identify and respond to new developments in tuna fisheries that have led to greatly increased catches, including juvenile tuna, and in the case of fish aggregating devices (FADs), by catch of associated species such as marine turtle.¹²⁹ In addition, the WWF criticized ICCAT for not following scientific advice. In 1994, for instance, the ICCAT Scientific Committee recommended that catches of the eastern Atlantic bluefin tuna stock should be reduced from the 1994 level by 25 per cent, starting in 1996. However, the first total allowable catch for this stock was not established until 1998. In 2006, in response to serious depletion of bluefin tuna stock, the Scientific Committee of ICCAT recommended an annual total allowable catch (TAC) of just 15,000 tons and a recovery plan that included closing the fishery during the spawning season. But ICCAT set the 2007-2009 TAC at nearly double this, 29,500 tons.¹³⁰ In addition, since Libya and Turkey rejected their assigned quotas and announced self-allocation, TAC in the Mediterranean would effectively be 32,414 tons. At the same time, estimated illegal fishing brings actual bluefin tuna catch to over 50,000 tons in the ocean area.¹³¹

Despite of these criticisms, ICCAT indeed has marked some progress in taking conservation and management measures in particular in combating IUU fishing. The actions taken by ICCAT initially to urge Taiwan to eliminate IUU fishing were successful. The size of Taiwan's Atlantic bigeye tuna fleet had been reduced from 144 in 2005 to 60 in 2007. More actions will also be taken by Taiwan, as required by its existing regulations or management measures, or new legislation to be enacted, to combat IUU fishing. The management efforts taken by ICCAT in dealing with the problem of IUU fishing set a good precedent not only for the Commission itself, but also for other RFMOs, which is helpful in the world's effort to conserve and manage marine living resources. However, it is urged that more actions could also be taken by ICCAT to deal with the problem of IUU fishing activities conducted by the Japanese, Italian, Tunisian, Libyan, and Korean fleets targeting bluefin tuna in the ICCAT's convention area.

125. Ibid., para 5 and 6.

126. "To maintain Our Country's Future Quota and Interests, Government Purchase Long-line and Trawlers Long-Distant Fishing Vessels under the Specific Program," *New Fisheries*, No. 243, September 10, 2007, pp. 20-21 (in Chinese).

127. For an updated report, see Kieran Mulvaney, ed., *Pirate Booty: How ICCAT is failing to curb IUU fishing*, Greenpeace Spain, published on November 9, 2007, available at: <http://www.greenpeace.org/international/press/reports/pirate-booty>

128. See, e.g., the critique by the World Wildlife Federation (terming the ICCAT quota system "little more than a political tool, hiding practices of tuna fishing, shipping, processing, and trading that violate existing rules") in the article *Illegal Tuna Fishing Leads to Demise of Species*, Nov. 16, 2004, in www.eaerthdive.com/site/news/newsdetail.asp?id=809. In November 2007, WWF Mediterranean's head of fisheries Sergei Tudela commented that "ICCAT has proved itself to be entirely incompetent, and has failed again in its duty to sustainably manage our common marine resource." See "Fisheries: Despite excess tuna catches, no cuts," *Natural Resource*, Vol. 10, No. 9, reported in *Greenwire*, November 20, 2007.

129. "Tuna in Trouble," *supra* note 22, p. 9.

130. Ibid., pp. 9-10.

131. Ibid., p. 4.

GMS Cooperation in Hydropower Development and Power Interconnection: Potentials, Progresses and Challenges

Lei Zhuning

Abstract: Cross-border hydropower development and power interconnection are the two main interlinked themes in GMS power cooperation. This paper introduces the GMS power cooperation and cross-border hydropower development and power interconnection. It explains the great potential for regional power cooperation and provides an account of the latest progresses in hydropower development and power interconnections among GMS countries. The development plan and policy objectives will be juxtaposed with the real progresses. China's participation in GMS power cooperation will be reviewed in view of the enhancing mutual understanding among GMS members. Challenges encumbering further developments will be enumerated and analyzed, and suggestions for improvements will be given in the expectation of promoting power cooperation in GMS in a healthy, sustainable way.

2.1 The Great Potential for Power Cooperation in GMS

The Greater Mekong Sub-region (GMS) originally included five countries and one province of China, i.e. Cambodia, Vietnam, Lao PDR, Myanmar, Thailand, and Yunnan province. The Guangxi Zhuang Autonomous Region of China later joined the framework of GMS cooperation but hydropower cooperation with GMS countries still concerns mainly Yunnan province due to its geographical proximity to several GMS countries. Altogether the GMS covers an area of 2.5 million km² and has a total population of 300 million (as of 2004).

In recent years, the GMS has experienced fast economic developments, together with a phenomenal increase in power demand. A number of forecasts for regional power demand in the GMS projected by regional cooperation organizations consistently show that the demand of electricity will almost double in ten years from 2010 to 2020 (Table 2.1 and Table 2.2). Myanmar, although not listed in the tables, also has seen fast growth of consumption of electricity in recent years and the consumption will also double from 2010 to 2020.

Figure 2.1 The Greater Mekong Subregion



Source Mekong Institute

Table 2.1 Forecast of regional power demand in GMS (MW)

Year	1995	2000	2005	2010	2020
Cambodia	84	176	384	580	1,649
Lao PDR	78	157	277	444	971
Thailand	13,420	15,254	20,818	28,913	43,627
Vietnam	2,910	5,505	9,226	14,474	28,180
Total demand (estimated)	14,000	19,000	28,000	42,000	71,000

Source Mekong Integrated Transmission System Study, Mekong River Commission (MRC), 1996.

Table 2.2 Forecast of peak demand of electricity in GMS (MW)

Year	2000	2005	2010	2015	2020
Cambodia	114	280	529	799	1,156
Lao PDR	167	280	442	618	784
Thailand	14,918	21,222	28,912	38,519	51,359
Vietnam	4,890	7,877	12,589	19,169	28,739
Total demand (estimated)	20,089	29,659	42,472	59,105	82,038

Source H.S. Woldstad, T. Holtedahl, G.L. Doorman. Large Scale Power Exchange in the Greater Mekong Subregion, 2004.

Table 2.3 Consumption of electricity of Myanmar (MW)

Year	2000	2005	2010	2015	2020
Electricity Consumption	44	58	84	123	178
Growth Rate		5.7%	7.6%	8.0%	7.6%
Peak Load	780	1,094	1,607	2,417	3,634
Growth Rate		7.0%	8.0%	8.5%	8.5%

Source China Southern Power Grid

The GMS area is endowed with a substantial potential for hydropower development. However, the potential is not evenly distributed among the GMS members. The two least developed members of the GMS, i.e. Lao PDR and Myanmar, and Yunnan province of China have huge largely untapped hydropower potentials for development (Table 2.4) while other countries, especially the comparatively well-off Thailand, are relatively poor in the energy resources and plans of domestic development of large hydropower projects are usually hindered by social and environmental concerns. Therefore, to meet the growing demand for electricity in GMS, there is an ever-increasing need to strengthen regional power cooperation among the GMS member.

The power cooperation through investment on hydropower development and interconnection projects in the GMS has the members linked together more closely. At present, in this cooperation Thailand and China (Yunnan) usually play the role of regional investors while other countries are at the receiving end of foreign investment and financial support. Main power exporters in the region are China (Yunnan) and Lao PDR while Thailand, Vietnam and Cambodia are power importers at most times. However, there are exceptional cases, especially in the border areas where Lao PDR imports power from China and Thailand and Vietnam exports power to Cambodia.

In the future, when the hydropower potential of Myanmar and Cambodia has been substantially explored and developed, the two countries will join Lao PDR in supplying electricity to the GMS fellow members. With fast economic growth, China could turn from a power exporter to a pure power importer, and Vietnam, for the same reason, could become more of an investor than an FDI-receiver especially considering its accelerated investment activities in Lao PDR.

Table 2.4 Potential for hydropower development of Lao PDR, Myanmar and Yunnan

	1	2	3	4
	Installed Capacity of Hydropower Stations (MW)	Hydropower Energy Reserves (MW)	Hydropower for Practical Development (MW)	=1/3
Lao PDR*	624.1	300,000	35,000	1.78%
Myanmar**	746	100,000	39,000	1.91%
Yunnan ***	11,000	104,000	98,000	11.22%

* Estimation of the Mekong River Commission(2005)

** Estimation of the World Bank(2005)

*** China's national survey on hydro resources (2003)

Table 2.5 Current relationships in the GMS power cooperation

	Power Exporter	Power Importer
Investor	China (Yunnan)	Thailand
Investment Receiver	Lao PDR	Vietnam, Cambodia

Table 2.6 Future (possible) relationships in the GMS power cooperation

	Power Exporter	Power Importer
Investor		Thailand, China, Vietnam
Investment Receiver	Lao PDR, Myanmar, Cambodia	Cambodia

2.2 Inter-governmental Agreement on Power Cooperation and the ADB Master Plan

On Nov. 3, 2002 at Phnom Penh, the six GMS member governments signed the "Inter-governmental Agreement on Regional Power Trade in the Greater Mekong Sub-region" (IGA). The agreement gives as objectives that regional power trade are for all participants to i) coordinate and cooperate in the planning and operation of their systems to minimize costs while maintaining satisfactory reliability; ii) fully recover their costs and share equitably in the resulting benefits, including reductions in required generation and transmission capacity, reductions in fuel costs and improved use of low-cost electricity sources; and iii) provide reliable and economic electric services to the customers of each Party.

Obviously, the reason behind the power cooperation is mainly economical. According to the Asian Development Bank's (ADB) research, power cooperation through interconnections of power networks of the member states can save about 1,377MW electricity in 2010 and 2,554MW in 2020, with a possible cost saving of up to US\$ 1.3 billion. Besides, the power cooperation will offer more reliability to the energy supply system and give a push to regional economic development.

In 2000, the Regional Indicative Master Plan on Power Interconnection in the GMS (RIMPS) was launched with financial support from ADB. A list of prioritized hydropower projects and interconnections of power grids were determined in the ADB funded study (Table 2.7 and Table 2.8). The proposed power interconnections are shown in Figure 2.2.

Table 2.7 Major hydropower projects for power cooperation in GMS

Project	Planned Commission Year	From	To	Installed Capacity(MW)
Nam Mo	2006	Lao PDR	Vietnam	105
Nam Theun 2	2008	Lao PDR	Thailand	1,088
Nam Ngum 2	2008	Lao PDR	Thailand	615
Nam Ngum 3	2008	Lao PDR	Thailand	460
Hongsai Lignite	2010	Lao PDR	Thailand	720
Se Pian-Xe Namnoy	2010	Lao PDR	Thailand	390
Xe Kaman	2010	Lao PDR	Thailand	468
Nam Ngiep 1	2011	Lao PDR	Thailand	240
Nam Theun 1	2012	Lao PDR	Vietnam/Thailand	400
Nam Kong 1	2012	Lao PDR	Vietnam	240
Xe Kaman 3	2012	Lao PDR	Vietnam	308
Tasang	2012	Myanmar	Thailand	3,600
Jinghong	2013	Yunnan	Thailand	1,500
Nuozhadu	2014	Yunnan	Thailand	5,500
Se Kong 4	2014	Lao PDR	Vietnam	440
Se Kong 5	2014	Lao PDR	Vietnam	253
Nam Theun 3	2016	Lao PDR	Vietnam	236
Lower Se San 2	2018	Cambodia	Vietnam	207
Sambor CPEC	2019	Cambodia	Vietnam	465

Source T. Lefevre. Review of energy sector cooperation in the GMS. GMS-EPF 11, 2004.

Table 2.8 Proposed power interconnections in GMS

Proposed Power Interconnections	Year of Commission
Vietam-Lao PDR-Thailand	2008
Lao PDR-Thailand	2009
Thailand-Lao PDR-Vietnam	2010/2012
Cambodia-Vietnam	2018/2019
Myanmar-Thailand	2012
China(Yunnan)-Thailand	2013
China(Yunnan)-Vietnam	2015

Source H.S. Woldstad, T. Holtedahl, G.L. Doorman. Large scale power exchange in the Greater Mekong Subregion, 2004.

Figure 2.2 Regional power interconnections in GMS



Source: Mekong Institute

2.3 Progresses of Power Cooperation among GMS Members

Sino-Vietnam Cross-border Power Cooperation

In early 2004 China and Vietnam reached an agreement on power transmission to North Vietnam. According to the agreement, in late 2004, Vietnam's No.1 Power Company and China Southern Power Grid started to link the power networks of both countries through three 110kv electricity transmission lines. On Oct. 31, 2005, witnessed by the state leaders of the both countries, the two sides signed an electricity purchase contract stating that on the basis of three transmission lines linking the two countries, 220kv new lines would be built to transmit electricity to six provinces of North Vietnam. The validity of the contract would last for at least ten years and the total contract value stands at US\$ 500 million.

On Sept. 26, 2006, the first 220kv transmission line linking China and Vietnam was put into operation and began to transmit electricity to Vietnam. Statistics show that by the end of March 2007, China Southern Power Grid had transmitted 1,840 GWh electricity to Vietnam through the four transmissions lines and the total sales volume of electricity export reached US\$ 80.76 million. The second 220kv transmission line linking Vietnam and China was completed and was put into operation in May 2007, with a capacity of sending 100 GWh electricity annually to Vietnam.

To meet the need of fast economic development and satisfy the demand for electricity, Vietnam several times proposed to accelerate power import and speed up the infrastructure construction to expand the scale and volume of electricity purchase from China. In addition, a severe drought predicted in early 2007 for the summer of that year suggested an electricity shortage of up to 100 GWh. This also prompted Vietnam to import more electricity from China

to prepare for the worst.

According to a statement of the Vietnam General Power Company, it will speed up the construction of 260kv transmission lines to import more electricity from China. The project includes building a 227.8km double circuit power network linking border towns on two sides of the border such as Hekou and Laocai and construction of several 220kv transformer substations. The project has enjoyed preferential investment policies offered by the Vietnam government which shows strong support.

In 2006, Vietnam General Power Company and China Southern Power Grid signed an additional electricity purchase contract with a total contract value of US\$ 216 million. According to the contract, the Vietnam side would purchase 1,100 -1,300 GWh electricity annually beginning from Jan. 1, 2007 and the period of validity of the contract is four years.

With the increased efforts from both sides, the Sino-Vietnam power cooperation is on a fast growth track. The Sino-Vietnam power cooperation project is so far the biggest cross-border power interconnection project of China. The construction and successful operation of the 220kv transmission lines is a milestone in Sino-Vietnam power cooperation and also an encouraging event for the GMS cooperation in power trade. Buoyed by the optimistic demand forecast from the Vietnam side, the China Southern Power Grid is planning to build transmission lines of 500kv to expand the export of electricity to Vietnam.

Sino-Lao Power Cooperation

Lao PDR is rich in hydropower potential and China has been accelerating investment in the hydropower sector in Lao PDR in recent years. In 2006, China invested US\$ 462 million in 45 projects in Lao PDR, of which about 32 per cent of which was in hydropower.¹

As mentioned above, Lao PDR is mostly an electricity exporter. However, due to lack of an integrated national power grid, the areas bordering on China still need to import electricity from China. In January 1999 EdL (Electricite du Lao, the electricity authority of Lao PDR) reached an agreement with China Yunnan Power Group Ltd. to import electricity through 110kv transmission lines from the transformer substation in China’s border town Mengla from 2001 to 2020. The agreement has been carried out successfully as planned.

Figure 2.3 Sino-Lao and Sino-Thai Power Interconnections



The Sino-Thai power interconnection project also crosses the northwest part of Lao PDR, therefore, there is possibility that Laos’ national power grid—when it is completed—can link up with Thailand and China’s power grid in this area in the future.

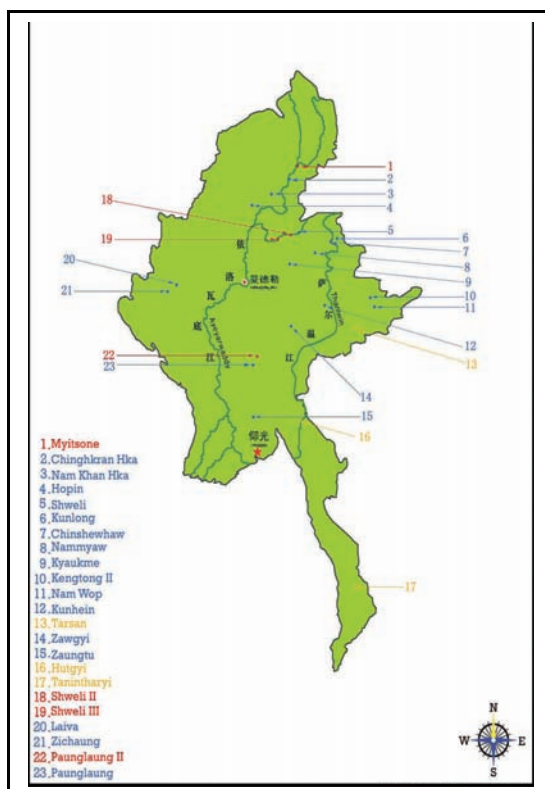
Sino-Myanmar Power Cooperation Power Cooperation and the Shweli Hydropower Project

Myanmar’s hydropower projects are mostly undertaken by China, Thailand and India due to the country’s lack of

1. *China top Laos investor last year*, Bangkokpost online report at: http://www.bangkokpost.com/breaking_news/breaking-news.php?id=122253

financial means and technology capabilities. China started hydropower cooperation with Myanmar in the early 1990s and has so far helped Myanmar build more than 20 hydropower stations, most of which are small and medium-sized such as Zawgyi I (with an installed capacity of 18MW), Nam Hkam Hka (5MW) and Zaungtu (20MW). Some of the hydropower projects were built in remote mountain areas cut off from the national power grid that is obsolete and in desperate need of maintenance and upgrade. The construction of small and medium-sized hydropower stations helped a lot with people’s daily livelihood. Formerly, people living in mountainous areas depended on diesel generators to supply electricity, and because of poor infrastructure conditions, transportation of diesel is far from easy for these mountain dwellers. Since some of the mountain areas where the hydropower projects were built are usually populated by ethnic groups, increased use of electricity brought about by these small and medium-sized hydropower projects to some extent promotes national conciliation and hence is conducive to Myanmar’s domestic stability.

Figure 2.4 China’s participation in hydropower development in Myanmar (as of 2004)



Blue—completed or under construction; red—under feasibility study; yellow—under negotiation)

Big hydropower projects undertaken by Chinese companies in recent years include the Paunglaung Project (with an installed capacity of 280MW), the Upper Paunglaung Project (140MW), the Yeywa Project (790MW) and the Shweli Project (600MW). The Shweli Hydropower Station is situated on the Shweli river (called “Ruili river” in Chinese), which is a tributary of the Irrawaddy river and runs through the southwest tip of Yunnan to north Shan State of Myanmar. It is a cross-border hydropower project—its location is just 50km from Sino-Myanmar borderline and 90km from China’s border town Ruili—and on top of satisfying domestic demand for electricity, most part of its electricity will be exported to China due to the limited market space for domestic electricity consumption in north Myanmar where there is not much modern industry and where about 10 million people scatter in and extensive mountainous areas. The Shweli Hydropower Project is a joint development project on a BOT (Build-Operate-Transfer) basis and the Myanmar side holds 25 percent of the share of the joint venture. It was firstly planned to have an installed capacity of 400MW, but later was increased to 600MW. The project is going to be completed and put into operation in the middle of 2008.

As the place of construction is mountainous and scarcely populated, this project enjoys favorable construction conditions, with little if any negative social and environmental impacts on the people living around the construction site.

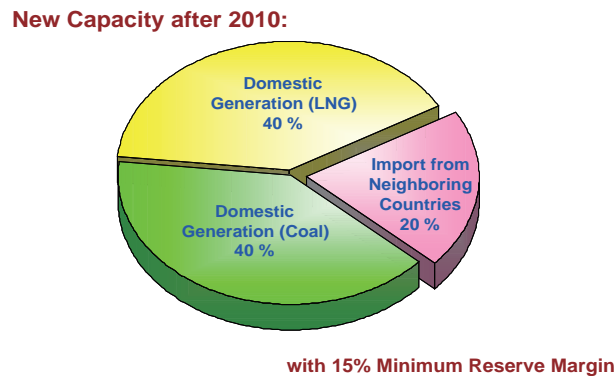
The only worry is about the reverse flow of water when the project is completed which may exacerbate flood problems for people of both countries living along the Shweli River during the rainy seasons. When the project is completed, an accompanying power interconnection project should also be carried out to link the power station with Yunnan’s power grid so that electricity can be sold to China.

Sino-Thai Power Cooperation on Hydropower Development and Cross-border Power Transmission

To meet the increasing demand of electricity, the Thai Government has been actively seeking power cooperation opportunities with neighboring countries. To date, the Thai Government has signed MOUs or agreements with Lao PDR, Myanmar and China on power purchase. As neighboring countries are in shortage of financial means and technology in hydropower development, Thailand also actively participates in establishing Independent Power Producers (IPP) through the form of joint ventures with companies from neighboring countries to produce and import electricity.

Through intensified power import effort, Thailand plans to increase power import to 20 percent of its total installed capacity after 2010 from a mere 2-3 percent in 2004 (Figure 2.5). This means that Thailand will increasingly depend on power imports from neighboring countries to meet its demand for electricity and address its energy security concerns.

Figure 2.5 Thailand’s domestic power generation and power import after 2010



Since Yunnan province of China has a huge hydropower potential, Thailand has been active in participating in hydropower development in that province. In November 1998, the Chinese and Thai governments signed an MOU in which Thailand expressed the will to import 3000MW electricity from Yunnan Province of China. Unfortunately, the implementation of this plan had been delayed in the aftermath of the 1997/1998 Asian financial crisis. Moreover, as China does not share a direct border with Thailand, the Lao Government’s acceptance of building a transmission line through the Lao territory is a prerequisite—although the Lao government had expressed its support to the transmission project at the 1995 Asia Subregional Power Forum.

The cooperation was restarted in late 2000 when the agreement of a jointly to be developed Jinghong hydropower project was signed by the EGAT (Electricity Generating Authority of Thailand), the GMS-POWER from Thailand, the China National Power Company and the Yunnan Power Group Ltd.. The Thai side agreed to input 70 percent of the investment while the Chinese side would provide the remaining 30 percent. The Jinghong hydropower station is situated on the Lancang river (upper Mekong in Yunnan) in the northern suburb of Jinghong, the capital city of Xishuangbanna Ethnic Dai Autonomous Prefecture, which is within 200km distance from Thailand. The electricity that it is going to produce will be transmitted to Thailand through northwest Laos.

The construction of the Jinghong hydropower station has been implemented smoothly and the whole project will be completed in 2012. Thailand will import 1500MW electricity produced from the power station beginning in 2013. On top of it, according the MOU signed between the two sides, Thailand will import additional 1500MW electricity from other sources in China starting from 2014, probably from the planned Nuozhadu hydropower project on Lancang river.

For China, the Jinghong hydropower station is a breakthrough in subregional power cooperation as 50 percent of the investment is foreign and all the electricity it produces is exported abroad—both are unprecedented in the his-

tory of China's hydropower development. It is the first time for China to try to allocate resources and funds based on market principles in international power cooperation. And since it involves not only China and Thailand but also Lao PDR, it is a multilateral subregional power cooperation project in real sense for the first time for China. Therefore, its success may have significant impact and be indicative of the direction of China's future power cooperation in the Lancang-Mekong river basin.

Thai-Lao Cooperation on Power Trade and Power Interconnection

The Thai-Lao power cooperation is the most important and active in the GMS area in terms of its depth and magnitude. In this cooperation, the two countries have a pure relationship of importer and exporter, with Thailand being the passionate buyer trying hard to secure its power supply and Lao PDR being the earnest seller in the hope of using the proceeds to reduce the country's poverty.

In June 1993, the two sides signed an MOU on the purchase of 1,500MW electricity from Lao PDR by Thailand before 2000. Three years later, in June 1996, the two sides replaced it with a new MOU increasing the purchase to 3,000MW electricity by 2006. Recently, the purchase was once again increased to 5,000MW.

In fact, Thailand's import of electricity from Lao PDR started as early as 1971. In the beginning, three power sources i.e. Nam Ngum 1 (with installed capacity of 30MW), Xeset 1 (20MW) and Nam Leuk (60MW) supplied electricity to Thailand all belong to EdL (Electricite du Laos). Another power sources under the management of EdL, the Xeset 2 (76MW), will join in the export to Thailand in the near future according to an MOU signed in December 2004 by Thailand and Lao PDR.

Table 2.9 IPP hydropower projects for electricity export to Thailand in Lao PDR

No.	Project	Installed Capacity(MW)	Annual Generation(GWh)	Year of Operation
1.	Theun HinBoun	210	1620	1998
2.	Houay Ho	150	617	1999
3.	Nam Theun 2	1088	550	2009
4.	Nam Ngum 2	615	2109	2010
5.	Theun Hinboun(extension)	310	2172	2011
6.	Nam Ngiep	260	1429	2012
7.	Nam Theun 1	474	1897	2013
8.	Nam Ngum3	460	1851	2013
Total:		3567	12245	

In recent years, Thailand has also been actively participating in the hydropower development of Lao PDR through the establishment of IPPs. A number of big projects including the mammoth Nam Theun 2 project (1088MW) have been taken part in or under feasibility studies by companies from Thailand (Table 2.9). By 2013, the total installed capacity of the Thailand's IPP hydropower projects in Lao PDR will reach 3567MW, with an annual power generation of 12,245GWh, of which a large share will be exported to Thailand.

Table 2.10 The power interconnection between Thailand and Lao PDR

Starting Point in Lao PDR	Ending Point in Thailand	Voltage of Transmission Lines (KV)	
		Installed	In operation
Nam Theun Hinboun P.S.	Nakon Phanom (EGAT)	230	230
Houay Ho P.S.	Ubon Ratchani 2 (EGAT)	230	230
Phonetong S.S (Vientiane)	Udon Thani 1 (EGAT)	115	115
Phonetong S.S	Udon Thani 2 (EGAT)	115	115
Thanaleng S/S (Vientiane)	Nongkhai (EGAT)	115	115
Pakxan	Boungkan (EGAT)	115	22
Thakhek	Nakhon Phanom (EGAT)	115	22
Savannakhet (Pakbo)	Mukdahan 2 (EGAT)	115	115
Bang Yo (Pakse)	Sirindikhom HPS/ Ubon Ratchathani (EGAT)	115	115

Figure 2.6 Thai-Lao power interconnections



At present, the power grid of Thailand is connected with that of Lao PDR through several 115KV and 230KV transmission lines (Table 2.10) and this power interconnection is the most important one both for Lao PDR and Thailand comparing with connections to other neighboring countries. As shown in the Figure 2.7, the power interconnection between the two countries links the Southwest of Lao PDR to Northeast of Thailand.

However, these linkages are not enough to accommodate the huge import of electricity in the coming years. For example, 95 percent of the electricity of Nam Theun 2 will be exported to Thailand when the biggest hydropower project Laos has ever undertaken be completed in 2009 if everything goes smoothly as planned. Therefore, EGAT, the Thailand electricity authority, is constructing three new 500KV transmission lines connecting the IPP hydropower projects in Lao PDR with the power grid of Thailand, of which the transmission line linking Nam Theun 2 with the northeast Thailand is the most important one. Furthermore, these transmission lines have to be extended through 500KV lines to the central area of around Bangkok where the load center of Thailand electricity consumption situates.

Thai-Myanmar Cross-border Power Cooperation

Myanmar, with its rich potential for hydropower development, is also an important country in Thailand's effort of securing energy supply besides Lao PDR. Thailand and Myanmar signed an MOU in July 1997 stating that Thailand would purchase 1,500MW electricity from Myanmar before 2010.

Table 2.11 Thailand power import from Myanmar planned in the 1500MW MOU

Project	Capacity (MW)	Year of Commission
Kentung(coal)	216	2011
Hutgyi(hydropower)	1200	2014
Thaninthayi(hydropower)	700	2015
Tasang(hydropower)	6×700	2016
Total	6316	

According to the MOU, the two sides would cooperate in developing the Tasang 2 hydropower project on the Salween river, which has an installed capacity of 7,110MW and would generate 35,446GWh electricity on average annually. All the electricity it produces would be exported to Thailand. Another MOU was also signed between Myanmar and Thailand for the construction of Tasang 1 with an installed capacity of 200MW (4x50MW) and 3 out of the 4 generators would work for Thailand's power market, only one 50MW generator would provide electricity for domestic consumption of Myanmar. However, the cooperation didn't make much substantial progress due to the impact of the 1997/1998 Asian financial crisis. The cooperation finally restarted in 2004 and in May 2005 the two sides signed another MOU to conduct feasibility studies on hydropower development in both the Salween river basin and the Thaninthayi River basin.

In Nov. 2002, the Myanmar government signed the Inter-governmental Agreement on Regional Power Trade in the GMS (IGA), opening the door to the possibility of connecting the proposed hydropower projects on Salween River with the Southeast Asian power grid. The starting point of the power cross-border interconnection is the Tasang hydropower project.

In recent years, the power authorities of both countries frequently held negotiations and talks on power cooperation and purchase of electricity from Myanmar. The main focus of these discussions is on developing a series of hydropower projects on the Salween River. Besides the Tasang hydropower project, Hutgyi hydropower project has become a controversial project. The Hatgyi project, with a planned installed capacity of 1,200MW, is a joint venture between Thailand, Myanmar and China, with 50 percent of the investment coming from Thailand and 40 percent from China. The total capacity could be expanded to 4,600MW and the total investment could reach US\$ 4 billion. Should it be completed, it would be the biggest hydropower project in Southeast Asia.

However, this project has met with stiff opposition from the local villagers, ethnic groups, environmentalists and other non-governmental organizations saying that the project would have negative impact on the livelihood of the millions of people living along the river and those at the delta of Salween River. The fieldwork for the feasibility study conducted by Thailand's power authority EGAT was never a smooth task. In May 2004, the feasibility study was interrupted when a surveyor from EGAT died in a land mine incident. The work had to be suspended again in early September 2007 when one of EGAT's employees was killed in a grenade attack.²

Considering the exacerbated political situation in Myanmar, it remains a question how far the proposed hydropower development projects can go. If these projects could eventually be carried out and be completed, Thailand still needs to construct more 500KV transmission lines to connect them with Thailand's power grid and the planned GMS power grid.

The power cooperation between Myanmar and Thailand is on a two-way track. Besides the plans of power import from Myanmar, Thailand also plans to export 100-150MW electricity to Myanmar to alleviate the power shortage that has been plaguing Myanmar. For this purpose, a transmission line linking Tak of Thailand and Pegu of Myanmar is

2. *EGAT suspends Salween dam study*, Mizzima online news report, September 5, 2007, available at: <http://www.mizzima.com/MizzimaNews/News/2007/Sep/16-Sep-2007.html>, and *Thai EGAT team discuss dam project with KNU*, Irrawaddy online news report by Violet Cho, Aug 23 2007, available at: <http://www.burmanet.org/news/2007/08/23/irrawaddy-thai-egat-team-discuss-dam-project-with-knu-violet-cho/>

being planned.

Vietnam-Lao Power Cooperation

According to the MOU signed in 1998 by both the governments of Vietnam and Lao PDR, Lao PDR would provide 2,000MW electricity to Vietnam. Later, the number was increased to 3,000MW.

Just like Thailand, Vietnam plans to import electricity from Lao PDR to meet its growing domestic demand for power. Its participation is also mainly through setting up IPPs usually in the form of joint ventures. As planned, the hydropower projects in Lao PDR which involve Vietnam participation have a total installed capacity of 2,188MW and can generate 9,243GWh electricity per annum once they are completed before 2016 (Table 2.12). However, most of them are still at the stage of feasibility study except for the Xekaman 3 project.

Table 2.12 Planned IPP hydropower projects for electricity export to Vietnam in Lao PDR

No.	Project	Installed Capacity(MW)	Annual Generation(GWh)	Planned Year of Operation
1.	Xekaman 3	250	980	2010
2.	Xekaman 1	468	1925	2011
3.	Xepian/Xenamnoy	390	1995	2012
4.	Xekong 4	440	1746	2016
5.	Xekong 5	400	1795	2016
6.	Nam Kong 1	240	802	2016
Total:		2188	9243	

Another obstacle in the power cooperation between Vietnam and Lao PDR is the power interconnection. Currently the transmission lines linking Vietnam and Lao power grid are only of 35KV. For power transmission in the coming years, more new lines with higher voltage levels have to be built. The current and planned interconnections between Lao PDR and Vietnam are shown in the Figures 2.7 and 2.8.

Figure 2.7 Central Lao PDR’s power interconnections with Vietnam and Thailand

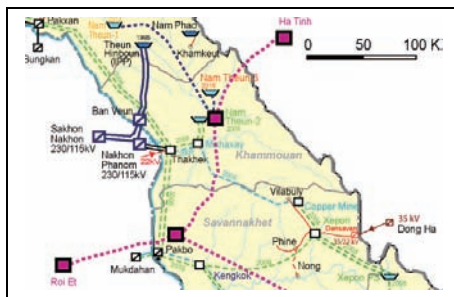
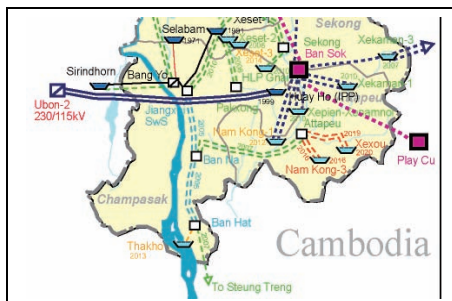


Figure 2.8 Southern Lao PDR’s power interconnections with Vietnam and Cambodia



Cambodia’s Power Cooperation with Vietnam, Thailand and Lao PDR

Cambodia suffers from power shortage and high price of electricity. Power trade with neighboring countries, especially Vietnam and Thailand helps to enhance the reliability of power supply and drive price of electricity down.

In 1999, Cambodia reached a bilateral power trade agreement with Vietnam from which to import electricity through 220KV transmission lines to supply its southern power grid. By 2002, Vietnam's had exported 2.8GWh of electricity to Cambodia. It is estimated that the power import could reach as high as 200MW by 2009. To ensure the transmission, Cambodia began to build a transmission line in April 2001, linking its power grid with that of Vietnam. The construction of this project would last 10 years and cost about US\$ 46 million. In Nov. 2004, the World Bank decided to offer US\$ 40 million in loans to finance the Cambodia-Vietnam power interconnection project. Together with financial supports from ADB and other international organizations, the project has received loans up to US\$ 125 million.

At the same time, Cambodia has also been negotiating power imports from Thailand. In 2000, the two sides reached an agreement on bilateral power trade. In July 2002, Thailand and Cambodia reached another agreement to link Aranyaprathet transformer substation in Thailand with Banteay Meanchey, Siem Reap and Battambang transformer substations in Cambodia, aiming at connecting Cambodia's northern power grid with the network of Thailand. According to the agreement, this power interconnection project will be completed in 2007 (Figure 2.9).

Figure 2.9. Thai-Cambodia power interconnection



At present, the border areas of Cambodia purchase electricity from across the boundaries with Vietnam and Thailand. This power trade helps to keep peace, stability and security in the border areas and is conducive to Cambodia's economic development. When the power interconnection projects mentioned-above are completed, Cambodia's state of power supply and energy security will be substantially improved.

Cambodia is also expecting to import electricity from Lao PDR, the potentially largest power exporter in GMS, but currently there are no power connections between the two countries.

2.4 China's Participation in GMS Hydropower Development

China is willing to forge closer cooperative relations in hydropower development with neighboring countries in GMS area. The basic principle of the hydropower development of China in GMS area is to pursue a mutually benefiting and sustainable way of development, in the aim of bringing benefits to the peoples living in the GMS area. The main contents of China's participation in the GMS hydropower cooperation include three areas.

First, China has been strengthening cooperation with neighboring countries in the lower Mekong area in hydrological monitoring and forecasting. As it is known, the share of hydrologic data, which is of vital importance in flood prevention, river navigation and the protection and allocation of water resources, is the very basis of regional cooperation.

tion in river basin development and hydropower development. Because the Lancang river basin, especially the middle and upper reaches of it, is a mainly underdeveloped area, it lacks basic hydrological monitoring and does not have the capacity of carrying out hydrologic prognosis due to the deficiency of hydrological infrastructures and the lack of continuity of data collection. To solve this problem, China on the one hand has intensified the construction of hydrological infrastructures and enhance its capability of hydrologic prognosis, on the other hand, China has strengthened international cooperation, especially with neighboring countries and the Mekong River Commission (MRC), in hydrological data exchanges and water resources utilization in the forms of exchanging hydrological data with the countries down the stream on a frequent basis, carrying out joint research programs, holding training courses and workshops, etc.

Secondly, China would like to provide more financial support to hydropower projects and regional power interconnection projects. The GMS regional power interconnection projects have long caught the attention of financial multilaterals such as ADB and the World Bank, which have been encouraging and advising on regional power cooperation and financing regional hydropower development and interconnection projects. China, with its huge foreign currency reserves, is capable of offering more help to alleviate the fund shortage in the GMS power cooperation.

Thirdly, China itself being a developing country and rich in experience in hydropower development, can offer suitable, mature technology and reasonable prices to support the construction of hydropower projects in the GMS area.

2.5 Challenges for GMS Power Cooperation

There are still many challenges in the way of GMS power cooperation. First of all, the deficiency of investment and technology capability is the main problem hindering the power cooperation in the GMS. The GMS countries, besides Thailand, are all less developed countries, and Yunnan province is an underdeveloped hinterland of China. With low level of economic development, poor infrastructure conditions and limited financial resources, the sub-regional countries lack funds and technology capabilities to carry out the hydropower development and power interconnection projects independently. Loans, foreign investments and technology support are indispensable for the success of the GMS power cooperation. The ADB and the World Bank so far have offered great support as evidenced by the Nam Theun 2 project in Lao PDR and other projects. But more help is needed.

Second, most of the GMS countries, except for Thailand, are more or less in different stages of transforming from state-controlled economies to market-based ones. Because of a lack of rule of law and a lack of transparency, the governments sometimes wield power arbitrarily in allocating limited resources. This gives the officials rent-seeking chances and corruption has become a prevalent phenomenon. Moreover, a lack of consistency and continuity in investment policies, red tape and bureaucratic inefficiency also put off many potential investors. Tight foreign currency control is also a problem when it comes to profit repatriation and this, although understandable in view of the 1997/1998 Asian financial crisis, damps the zest of possible investors.

Third, the evaluation of social and environmental impacts or costs of the hydropower development is difficult. In addition to economic benefits, hydropower reduces greenhouse gas emission, but hydropower projects, especially the big ones, sometimes come with inevitable negative social and environmental impacts. No widely recognized mechanisms or trusted institutions exist to evaluate the pros and cons objectively and the hydropower development can be easily derailed by environmental and migration issues. Having said that, even if the social and environmental impacts could be objectively evaluated one way or another, it still seems impossible to let the participants share the social and environmental costs in light of the current framework for regional cooperation.

Fourth, although there are a number of agreements and several forums and expert teams to facilitate the power cooperation among the GMS countries, there still is a lack of easy channels for exchanging views and clarifying misunderstandings and there seems to be no effective means to solve cross-border problems in some parts of the GMS. Conflicts of interests are sometimes unavoidable in the cooperation in the GMS, which is famous for its political, economic, social and cultural diversities. Whether the GMS members can solve the conflicts and controversial issues through dialogues and negotiations is a grave test for the maturity of the GMS cooperation.

Fifth, political stability and social security are still a hindrance to cross-border hydropower development in some parts of GMS.

And last but not least, in essence, all the questions boil down to whether the power cooperation can bring tangible benefits to the people. It is usually the case in hydropower projects that the developers, whether foreign or nationals,

and the governments at higher levels take the lion's share of the benefits while local people and governments at lower levels bear the brunt of all the negative impacts. How to make the benefits trickle down to the people, letting them have proper compensation, substitute job opportunities and a reasonable share of the benefits when the implementation of project and migration becomes inevitable should be the first and foremost concern of the policy-makers.

In sum, to pursue a healthy, sustainable way of hydropower development and power cooperation in the GMS, it is necessary or imperative to empower the people and properly distribute the benefits of power cooperation not only among GMS members but also among domestic social strata in respective countries.

Despite of all these challenges, it is encouraging to see that the great natural, social and economic disparities existing among the GMS members have so far not separated them, but have served as a driving force behind the power cooperation instead. In the spirit of "unity in diversity", we have reasons to expect more progress and success in the GMS power cooperation in the coming years.

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The Role of Institutional Capacity in Enabling Climate Change Adaptation: The Case of the Guadiana River Basin

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Abstract: This paper focuses on the trans-boundary Guadiana River Basin, where the river acts as a natural border between the neighbouring countries of Spain and Portugal. Considered a relatively undisturbed region, it houses high-quality natural landscapes and a richness of biodiversity which are valued and defended by local people as part of their cultural heritage, with present day land use reflecting a mix of coastal and inland tourism, and extensive and intensive agricultural activity. However, Guadiana is also a semi-arid region where human activity and modification of the hydrological regime over previous decades have led to increasing water scarcity and the identification of water shortage as a 'structural characteristic' of the system. These considerable environmental problems are likely to be amplified by climate change with important consequences for the availability and distribution of water between different sectors in the future. In light of these anticipated climate risks, and associated environmental problems, this paper reflects on possible sources of conflict and convergence between agriculture, tourism and water resource management sectors, and evaluates the role of institutions in pursuing a multiple-goal strategy that addresses water scarcity, adapting to climate change, and sustainable rural development. This evaluation will be informed by consideration of the institutional settings conducive to adaptation, as well as a critical appraisal of horizontal, vertical and transborder policy frameworks, and their enabling role in promoting adaptation activity.

3.1 Introduction

This paper draws from research being carried out for the EC-funded ADAM project (Adaptation and Mitigation Strategies: Supporting European Climate Policy¹). This is a large-scale integrated project involving research institutes from across the EU which aims to address one of the main threats facing future societies – climate change. An increasingly consensual view, promoted through the collaborative efforts of the international scientific community, is that climate change is happening, and importantly, that human activity is making a discernible contribution to this change (IPCC, 2007). Although mitigation continues to be the prime focus for policy makers (for example, the Kyoto Protocol came into force in 2005), the mid to late 1990s witnessed a shift in emphasis, with the international scientific community becoming increasingly concerned about the risks associated with a changing climate and the need for nations and communities to adapt (McEvoy et al. 2006). In response, the ADAM project (2006 – 2009) is not only researching the reduction of greenhouse gas emissions i.e. the mitigation agenda, but is also jointly considering how to adapt to change that is unavoidable. This dual focus is based on the understanding that much of the change in climate over the next 40 years or so is already pre-determined by past emissions (the linkages between these two different agendas will also be investigated).

Climate change is likely to bring both opportunities and challenges - for instance, the European Environment Agency (EEA 2006) documented the wide ranging impacts of climate change for Europe. For some (particularly in Northern Europe), the opportunities will result from warmer summers and milder winters, though for others the challenges associated with flooding, droughts, heat extremes, and storm events are likely to be much more substantial. An increase in both the frequency and severity of most weather-related extreme events is forecast, with impacts potentially cascading through social and economic domains. This recognition, that climate change is not only an environmental issue but will also have very important social and economic implications, was given an important public airing by the Stern Review, 2006, and is partly responsible for reinforcing the heightened profile of the climate change issue and its recent rise up many national policy agendas. Indeed, this is not only a distant threat – an increase in climate variability and extreme events are already being observed, as evidenced by the 2003 heat wave which affected many cities across

1. <http://www.adamproject.eu/>

Europe, resulting in tens of thousands of heat-related deaths, and the outbreak of forest fires, following a long drought period, across the Mediterranean region in the summer of 2007. Notably at the same time, another part of Europe, Northern England, was experiencing widespread and devastating flooding. Increasing scientific consensus suggests that these types of extreme events will become even more commonplace in a future, warmer, climate (IPCC 2007).

Although human responses to environmental stresses are not new, nor even a new subject of scientific enquiry, adaptation to climate change is an evolving area of interest to both research and policy communities, though it is important to note it is one still very much in its infancy. Indeed, the scale, complexity, and global nature of climate change pose significant challenges. “Climate change represents a classic multi-scale global change problem in that it is characterised by infinitely diverse actors, multiple stressors and time scales” (Adger 2006: p.273). Furthermore, despite human systems having some degree of capacity for self-adjustment it is increasingly recognised that the likely pace and intensity of climate change will be such that planned adaptation will be needed to reduce vulnerability and / or exposure to a range of different climate-related hazards.

The crosscutting nature of possible adaptation responses adds further complexity to this already complicated mix. Conceptually, a definition of adaptation commonly used is the ‘adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities’ (IPCC 2001). As our understanding of what adaptation actually involves has improved over time, it has been recognised that planned adaptation can: 1) focus on either managing the impacts of the climate-related hazard, reducing exposure to the hazard, or reducing the vulnerability of elements at risk (though in reality responses may sometimes overlap in their categorisation); 2) involve a range of actors throughout society from Governments down to individuals; and 3) manifest itself in many forms (the Stern Review, for instance, highlighted differences according to whether measures were anticipatory or reactive, private or public etc).

Recent attempts to make the concept operational, and hence more relevant for practitioners, have also found that distinguishing between process (building adaptive capacity) and outcome (the delivery of actual adaptation measures) can be useful (UKCIP, cited in Tompkins et al. 2005). This is reinforced by the academic work of Smit & Wandel (2006) who noted that in the context of human dimensions, adaptation refers to a process, action or outcome in a system which is aimed at adjusting to some changing condition, stress, hazard, risk or opportunity; as well as Stern (2006) who distinguishes two levels of adaptation: a) building adaptive capacity, and b) delivering adaptation action. The distinction between process and outcome has also proved to be a useful method for framing ADAM research activity. Whilst this paper will reflect on both forms, the primary focus of the analysis will be on the process of adaptation, in particular institutional adaptive management and the building of adaptive capacity.

3.2 ADAM Case Studies as Learning Examples

Adopting a bottom-up, actor-based, perspective, ADAM research carried out to date has involved the elicitation of expert knowledge from those largely responsible for adaptation in practice (although influenced by multi-level processes, the operationalization of adaptation is primarily local in scale, with measures needing to be suited to the local situation – accounting for hazard, exposure, vulnerability - in order to be effective). Of special interest is how organisations develop their understanding of climate risks, and then move beyond this to the implementation of adaptation measures i.e. the process of enabling adaptation to take place.

The research programme was specifically designed to ensure that engagement with stakeholders played a key role in the learning process, with interaction occurring through interviews, questionnaires, and stakeholder workshops. As well as holding important information on adaptation at the scale of implementation, these actors can also often act as ‘gatekeepers’ to valuable anecdotal evidence and unpublished reports (Tompkins et al. 2005). This is backed up by the ADAM experience which has discovered that although many interesting things are being done, in many cases these are not ‘badged’ as adaptation or even disseminated as such. It was intended that an actor-based approach such as this will provide a valuable perspective on institutional adaptive management, the determinants of adaptive capacity, as well as highlighting those mechanisms needed for delivering adaptation. This was considered important as ‘research focussing on specific adaptation options rarely investigates the processes through which adaptation measures are undertaken’ (Brooks 2003).

Engaging with experts and other key stakeholders in the learning examples was originally perceived as a process

involving several cycles of learning: starting with a definition of the research questions, planning the stakeholder engagement process, engaging then reflecting on the responses before developing new questions to delve deeper into existing issues or to explore new ones through further rounds of engagement. By interacting with key actors in this way the research team hoped to uncover valuable information on some of the key drivers for change, identifying what supports effective adaptation decision-making in different institutional settings (as well as what barriers to learning and information sharing exist), and how individuals and organisations interact in ways that either enhance or impede this. This iterative approach, where the output of one engagement informs the focus and questions for the next round, enables the research team to be open to emerging ideas and themes that may not have been obvious at the start, allowing for more genuine learning (and the possibility for surprise and unexpected connections). Ultimately, the overall aim of the learning examples is to better understand how successful adaptation is managed by different organisations and within different institutional settings (McEvoy et al. 2007).

The selection of ADAM learning examples (involving different sectors, themes, and landscape types) were chosen to ensure representation of a range of different characteristics and circumstances, including differences in geographical location and vulnerability, levels of awareness and perception of risk, institutional presence, decision-making cultures, and the roles and motivations of public bodies and private interests (as well as relationships between them). This paper reflects specifically on scoping analysis carried out for the lower Guadiana river basin, in particular a series of interviews and a stakeholder workshop held at the end of 2006 (note: the ADAM project has three regional case studies – the lower Guadiana river basin which intersects Spain and Portugal, the Tizsa region in Hungary, and an international case study, Inner Mongolia). That said, the paper is also grounded in the ongoing work being carried out across the full suite of ADAM learning examples.

3.3 The Guadiana River Basin: Past, Present and Future

The Guadiana river basin is one of the three main drainage units of the Iberian Peninsula (Duoro and Tejo being the others). It has its source in Spain (which has the largest storage capacity of the two countries) before flowing into Portugal and then, in its lower reaches, acting as a natural border between the two countries (Figure 3.1). Subject to a semi-arid climate regime, the water balance is particularly fragile in the river basin with water shortage considered a structural characteristic of the system (Cots et al. 2007). This historic problem has worsened in recent times with analysis conducted for Portugal highlighting decreases in both precipitation and stream flow. The SIAM project report published in 2001 indicated that precipitation data (1931-2000) shows a generalised but weak decreasing trend that has become much more pronounced after 1976. Recent trends also include a shorter rainy season, an increasing number of consecutive dry days, and an increase in the frequency of severe and extreme droughts, particularly in the southern region, over the last ten years (SIAM 2001). This evidence is emphasised by the drought of 2004-05 which was the most severe recorded since the 1940s (INAG 2005: as cited in Kilsby et al. 2007). Furthermore, of the three main river basins, the Guadiana river basin has the lowest fluvial flow under natural conditions (according to the National Water Plan, the average annual precipitation is about 960mm/year, though the Guadiana basin receives much less, a mere 570mm/year).

Although obviously a key factor, the decrease in precipitation is not the sole variable affecting river flow and water availability. Another important stressor is significant human modification of the hydrologic regime that has taken place over the past forty years, with the Guadiana River now having highly controlled flows (primarily as a result of the increasing use of dams to store water in order to satisfy the substantial demand from agriculture and other economic sectors). Other stressors that further compound the water scarcity problem include illegal wells to extract groundwater and increasing urbanisation (Cots et al. 2007). This combination of factors has led to a certain degree of cross-border tension between the two countries, with intensive extraction on the Spanish side leading to a progressive decrease in the quantity and quality of river flow downstream (the low flows are such that salt water intrusion is also becoming an issue in the lowest reaches), raising Portuguese concerns about reduced and irregular river flows (Maia 2000). It is also possible to view these transboundary issues through an economic lens, with the intensive use of water resources helping to support the livelihoods of people in the Upper Guadiana basin, though the cumulative effects downstream, as well as the indirect ecological costs, remain largely unrecognised (ADAM 2007). In stark contrast, some of the poorest municipalities in Portugal can be found across the border, with problems relating to an

ageing population, long-term unemployment, and the trend for an out-migration of young people. Indeed, Portuguese Authorities often link these state of internal affairs to the water shortage situation (WWF 2003).



Figure 3.1 Location of Guadiana River (source: Encarta)

Potential conflict is not only confined to different geographical entities but also extends to competing sectors due to a strong differentiation of land use in the river basin. In the lower reaches, tourism is dominant on the Portuguese side with the Algarve a popular coastal destination (the richness of natural heritage in the area is also important as an alternative tourism offer – for example, about 100 wetlands have been linked together to form the La Mancha Húmeda Biosphere Reserve), whereas on the Spanish side, tourism competes for land and water resources with intensive agriculture (the Costa del Sol region). The middle zone is hilly and forested on both sides of the divide, harbouring a unique ecosystem called *dehesa* (Spanish) or *montado* (Portuguese). Supporting a mix of extensive agriculture, forestry (particularly cork and common oak), and cattle breeding, the ecosystem is considered to have a high landscape value and is defended as part of the region’s cultural heritage. The upper reaches are dominated by large-scale agriculture, with crops including cereals, wine, olives, and citrus, though the share of irrigated land is expected to change with the operation of the new Alqueva dam on the Portuguese side (ADAM 2007). Newly created, it is intended that the dam will bring security of supply benefits, though water allocation remains uncertain and there are concerns about a tendency to disproportionately favour larger sectors and organisations (industry, intensive agriculture etc.) to the detriment of other aspects of regional development [e.g. to make Alentejo the ‘garden’ of Portugal] and issues such as nature conservation (Ibid).

As a semi-arid zone, it can be seen that the combination of irregularity and intensity of rainfall, significant vari-

ability in year-by-year rainfall and temperature, and an over-exploitation of existing water resources, all interact to influence the availability of water in the Guadiana. However, as we look to the future, it is vital that changes to the climate are also factored into all planning and development decision-making processes. The two most important climate impacts for this river basin, as cited by Siam (2001), include a rise in temperature (by 2100, most global circulation models estimate that the Iberian Peninsula will experience an increase of between 4-7 degrees Celsius) and a reduction in rainfall (an annual decrease in rainfall of around 100mm/year is likely, though it is important to note that there will be significant seasonal variability with the months of spring set to be worst impacted). Other recent research corroborates this evidence, with a study by the Spanish ECCE Project (2005) highlighting that water shortages, summer droughts and desertification are very likely to increase in the future, and the impact assessment carried out by Kilsby et al. (2007) projecting a major reduction in flows caused by both a reduction in rainfall and an increase in potential evapo-transpiration (PET). The frequency and intensity of extreme events, such as droughts, will therefore become increasingly problematic for the Guadiana region.

A changing climate will have important direct and indirect consequences for economic activity in the region. For instance, a dominant agricultural sector will be subject to decreased precipitation during the growing seasons (spring and summer) with increased irrigation requirements at a time of low water availability, ultimately adding to existing conditions of water stress. Furthermore, the system is also likely to be impacted by 'multiple-stressors' (see for example: O'Brien et al. 2004), including: threats from new pests and diseases, a worsening of erosion and desertification, a loss of fertility, and a greater incidence of forest fires. Changes to climatic conditions also enhance other risks to forest resources, especially through increased tree mortality and land degradation (SIAM, 2001). This is particularly unfortunate as the rise in temperatures will increase the demand for outdoor recreation, with forests and woodland areas having the potential to provide suitable conditions and micro-climates for a range of activities (this highlights one obvious link between leisure / tourism and the natural environment).

It is likely that tourism in the region will also be impacted negatively, both directly and indirectly. The indirect impacts on tourism activity relate to climate change increasing the vulnerability of attractive local landscapes (for instance in terms of forest fires), with important implications for the 'carrying capacity' of the area (McEvoy et al. 2008; Garrigos Simon et al. 2004). More directly, many studies have suggested that Mediterranean region will become less attractive (and competitive) under climate change though much of this analysis is based on increased temperatures e.g. a northwards shift in tourism patterns in Europe as the appeal of the Mediterranean deteriorates, in contrast to more northerly European Union (EU) destinations which may potentially benefit from hotter summers (McEvoy et al. 2006b; Amelung & Viner 2006; Agnew & Palutikof 2001). Here again, other issues may also come to the fore, including increased incidence of disease, water shortages, desertification etc, as temperatures rise.

However, there is another hypothesis to consider. This is that decreasing water availability in the region may act as a significant barrier to long-term sustainable tourism, and lead to competition between the tourism and agricultural sectors not only in terms of land but also more and more in terms of access to water. Although water availability is not a major focus of the majority of climate change and tourism studies particularly at a macro-scale, it is evident that the projected impacts for the region are serious, even potentially threatening the bipartite water treaties signed between Spain and Portugal, with the supply of water to both urban and rural regions of Portugal of major concern (Kilsby et al. 2007). The transboundary tensions are encapsulated in the Portuguese demand for 6 million Euros in compensation from its Spanish neighbour after flows in the Duoro River fell below limits agreed by a bilateral agreement during the recent severe drought event (Ibid).

As a final point, it needs to be re-emphasised that climate change is only one of a set of multiple stressors; though it will act to intensify existing problems in the river basin system, as well as introducing new uncertainties. In light of these new emerging climate-related risks, the authors argue that new transboundary institutional structures will be needed to enable effective adaptation responses, ensure that a balanced 'multiple-goal' strategy is in place, and ultimately, promote a regional development pathway that is sustainable in the longer term.

3.4 The Institutional Context

The research team embraced a broad definition of institutions i.e. being a "system of rules, decision making procedures, and programs that give rise to social practices, assign roles to participants in these practices, and guide interac-

tions among the occupants of relevant roles” (as used by IHDP, amongst others). Up front, it is important to distinguish between organisations (stakeholders or actors) and institutions (the system of rules which influence actor behaviour and determine the character of their practices). Institutions can be said to enable or constrain behaviour, operate at multiple scales, and have a certain level of permanence (Bakker 1999), and can also be either formal or informal. Formal institutions are created explicitly; though informal institutions can also arise as process of social self-organization and through social order reflecting culture, habits and customs (Scott 1995).

For the ADAM project, it was envisaged at the outset that the latter category would be an important focus of the research process in recognition that the degree of shock caused by an extreme event can be ‘positively correlated with the degree of informal arrangements set up to mitigate it’ (SIRCH, undated). Institutions were also to be investigated according to a number of perspectives (see for example: Pelling & High 2005): structural (social, economic and political), agency-centred (examining the importance of power and access to power between different actors) and adaptive capacity (particularly the role of learning as embedded in social relationships).

Looking back over recent history, whilst vertically integrated hierarchies were once seen as an appropriate institutional order, the 1980s and 1990s saw a challenge to the idealised model of democratic government, with political science literature characterising a ‘hollowing out’ of functional governance (Pierre & Guy Peters 2000). It is now postulated that the governing state has been replaced by an enabling state, and that there has been a discernible shift from ‘government’ to ‘governance’ with a greater emphasis on coordination and facilitation. An important outcome of this ‘re-scaling’ of state functions has been the rise of broader and more dissolute local governance which extends beyond the formal agencies of local government, and it is argued that politics is increasingly conducted outside traditional institutions. Further evidence suggests a blurring of boundaries between public and private spheres, and a transnationalisation of politics (Kenis & Schneider 1991).

During this period there has also been an increasing emphasis on environmental concerns and a desire to more closely align societal activity within the limits of natural capital (working with rather than against nature). This change of perspective has combined with a trend towards the decentralisation of environmental policy, acting to create new regulatory and political dilemmas at the local level, dilemmas that are said to necessitate new co-ordinated governance structures (Gibbs & Jonas 1998). This is reflected in the move towards new forms of governance in water resource management, with a shift from a technical management paradigm (and a reliance on rigid functions and hierarchies) towards more flexible ‘adaptive management’ of shared resources. This new management approach is based on more open and inclusive processes where social learning, changes to organisational management practice, and the integration of information and a plurality of perspectives, are all considered important attributes (Pahl-Wohl 2007) i.e. the ultimate aim is to achieve a balanced and flexible system of decision-making with an explicit consideration of many different points of view. The emergence of institutional diversity (as described by Ostrom, 2005, for example), and the linking of public and private actors to achieve shared objectives, has heightened the importance of networks, and other similar mechanisms, which act to support collaboration, learning, and the building of adaptive capacity. Such platforms are considered critical for achieving iterative and decentralised solutions which are specifically tailored to local circumstances (Ibid).

Informal interaction is often cited as particularly important for enabling ‘context rich learning’ amongst local actors e.g. the space of informal interaction that lies outside of, but interacts with, formal institutions and relationships has been characterised a ‘shadow system’ (Stacey 1996; as cited in Pelling & High 2005). It is important to realise that these informal institutions are not meant to replace existing formal entities per se rather they can provide valuable space for reflection, an exchange of perspectives, and potential cooperation between different stakeholders and interests’ i.e. to complement those formal institutions which are based on more vertical lines of command.

In the EU policy domain, cross-border initiatives have been part of European thinking since the early days of the supra-national process. This is evidenced by the Association of European Border Regions (AEBR) which was established in 1971 in order to stimulate cross-border cooperation (in keeping with the spirit of enhancing economic harmony between neighbouring countries). A further boost to this agenda was the introduction of the INTERREG funding programme in 1988, which sought to actively promote cross-border initiatives i.e. working together on common projects to develop new solutions to economic, social and environmental challenges. This mechanism has recently been succeeded by the 2007-2013 Territorial Cooperation Objective, which has similar objectives, seeking to foster integration and overcome barriers to collaborative activity and the pursuance of sustainable development (Cots

et al. 2007). Elsewhere, the inclusion of stakeholders in a meaningful way was promoted by the White Paper on European Governance (2001) which emphasised five key principles: openness, participation, accountability, effectiveness and coherence. Launched in 2000, these principles were also embraced by the Water Framework Directive (WFD). Introduced in an attempt to combat fragmented policy intervention, it designates the river basin as the primary unit for governance and emphasises the integration of stakeholder participation into planning and management activity, including meeting sustainable development obligations. This piece of legislation is considered to be the major driver for achieving sustainable management of water resources in EU Member States for the foreseeable future.

It is within this evolving institutional context that the authors now reflect on the institutional response to climate change in the transboundary Guadiana river basin.

3.5 Institutional Adaptive Management in the Guadiana River Basin

As discussed, water resource management issues in the Guadiana basin are complex and multi-faceted, with responsibilities shared between countries and across spatial scales and different sectors. As such, there has been a long tradition of cooperation between Spain and Portugal over their shared resources, though it is becoming increasingly evident that the design of new cross-border institutional arrangements is needed to ensure a comprehensive and effective adaptive management response to the mounting environmental threats that will be amplified by climate change, in particular that of water scarcity and potential future conflicts between different countries, sectors, and actors. Although the WFD has undoubtedly given impetus to the restructuring of water regimes across the EU, and in this case study intensified levels of cooperation between the two countries, it is apparent from ADAM scoping activity that many obstacles to sustainable resource management and environmental protection still remain in this particular transboundary context. This viewpoint is reinforced by feedback at the ADAM stakeholder workshop (Mertola, Portugal, December 2006) which highlighted few isolated initiatives and the lack of an integrated approach as deficiencies of the current situation (ADAM 2007). As a result, a key recommendation coming out from this engagement process was an urgent need for improved coordination of resource management activity in the region.

First taking the two countries as separate entities, Spain has designated responsibility for the development and implementation of regional water plans to hydrologic confederations. Although welcome advances have been made under this new regime, including the approval of a Guadiana Water Plan in 1998 which sets out to correct overexploitation of wells and groundwater on the Spanish side of the basin, voices remain critical of the closed nature of the decision-making community and there is ongoing pressure to expand the community beyond the 'usual suspects' of engineers, agricultural organisations, construction and energy companies etc (Cots et al. 2007). Portugal does not escape criticism in relation to institutional shortcomings. Despite early plans, the country has yet to introduce authorities that have specific responsibility for the river basin, instead allocating responsibility for river planning to the national Institute for Water (INAG), regional directorates, and the Ministry of Environment. Although there are signs of some degree of institutional change being embraced in both these national cases, progress has not been as rapid or as far reaching as many stakeholders in the region would have liked, with policy making and management decisions continuing to be informed by the dominant paradigm of technical determinism (Ibid). Indeed, there are concerns that an over-reliance on centralised planning may be counterproductive in the longer term, limiting flexibility and capacity to adapt under new conditions of uncertainty.

On a more upbeat note, the emergence of new transboundary arrangements in recent times has acted as a stimulus for greater cross-border cooperation and represents considerable potential for enhanced collaborative activity in the future. The first example is the bipartite treaty 'Convention on cooperation for the protection and sustainable use of the Portuguese – Spanish river basins'. This formal treaty has resulted in the establishment of the Commission for the Convention Development and Application (CDAC) as a coordinating / cooperation mechanism, though critical analysis suggests that although there has been some success in terms of knowledge sharing and cooperation, the goal of joint management remains elusive (Maia 2001). The second example which attempts to support transboundary initiatives is Gabinete de Iniciativas Transfronterizas (GIT). This organisation was set up following funding from the INTERREG programme in order to lead a process of participation aimed at informing an integrated transboundary strategy for the period 2007 – 2013. In light of the arguments put forward in this paper, the authors consider this organisation an especially important asset for the river basin. Not only does it operate as an implementation authority

for INTERREG, it also acts as a bridging organisation between the countries, attempting to integrate many sectors and themes as well as mobilising and fostering links between different actors. As planning for climate change will benefit considerably from a more flexible and adaptive paradigm (in order to deal with uncertainties and the consideration of multiple stakeholder perspectives) the role of GIT in providing networking capacity, championing the transition process, enhancing the coordination of activity operating at different scales, and linking across sectors and policy domains, will be an invaluable resource for promoting regional sustainable development.

Beyond the institutional dimension, and in more practical terms, adapting to climate change on the ground needs to be underpinned by a better understanding of context specific climate risks. Assessment tools are needed not only to evaluate anticipated climate-related hazards but also to determine the vulnerability of different 'elements at risk' in the Guadiana river basin. The heterogeneous stakeholder dimension will also need to be accounted for. Whilst the generation of such knowledge is obviously important for risk management and decision-making it can be argued that its subsequent transfer and integration within local management activity is just as critical, if not more so. The need for knowledge transfer, awareness raising, and education is best illustrated by a comment made at the ADAM stakeholder workshop – '*climate change is for penguins*'. Although an 'off-the-cuff' remark by one of the attendees, it does reflect a disconnection that many people feel from the enormity and timescale of the climate change issue and a common perspective that it is either not a problem to be personally concerned about, or alternatively that its problem structure is so complicated there is little that ordinary people can do about it. However, when discussions are reframed in a local community context or according to issues important to day-to-day activity, then personal experience and anecdotes of increasing drought, water stress, fire outbreaks etc begin to emerge. Hence, engaging with different stakeholder communities, and raising awareness that extreme weather-related events will likely increase in both their frequency and intensity under a changing climate, is an important component of the process of adaptation.

When considering and evaluating potential adaptation options in the Guadiana river basin it will be important to consider the inter-linkages, as well as potential spill-over effects, between different sectors. Scenarios indicate that water resources will be significantly impacted by climate change in the future, however there is a need to move beyond a purely hydrological focus to consider the portfolio of inter-linked resource management issues within a broader socio-ecological framework. Examples of important considerations for regional decision-making include: the impacts of land use policy on water availability (agriculture and tourism sectors as drivers of demand), the socio-economic conditions present in different areas, and even the role of economic diversification as a potential adaptation strategy e.g. promoting the combination of extensive agriculture with sustainable forms of tourism (although not introduced to address climate change specifically the value of diversification has already been recognised by the European Commission through its attempts to encourage the combination of agriculture and tourism by means of specific directives, and the promotion and enhancement of rural development). In particular, decision-makers need to identify the inter-dependencies between multiple policy domains (agriculture, irrigation, sustainable water management, tourism, and rural development are all closely intertwined) in order to better understand trade-offs, synergies and conflicts between different agendas. These dependencies will be fundamental issues in the challenges posed by climate change to the region.

In summary, research findings suggest that although formal institutional arrangements in the Guadiana river basin are evolving, significant barriers still need to be overcome. These derive either from the transboundary setting (inequalities of power, and differences in language, culture, and administrative rules) or from inherent deficiencies in the transitional institutional framework (restricted participation opportunities, communication and knowledge transfer). Furthermore, what appears to be lacking at the current time is the presence of effective informal institutions and adequate spaces for interaction between different actors in the river basin. The authors contend that flexible modes of interaction are extremely important in enhancing integration between actors, enabling an appreciation of the perspectives of different stakeholders, building local adaptive capacity, and supporting learning processes (informal communities of practice operating as vehicles for peer-peer learning for example). Developing institutional capacity, encouraging flexibility, and actively promoting interactions that are conducive to local innovation and learning, can all enhance the ability to alter and improve management practice as problem structures change. These will be vital responses to the uncertainty, shocks and surprises likely to be brought about by future climate change.

3.6 Concluding remarks

As research into the ADAM learning examples has progressed it has become increasingly apparent that enabling processes are vital cogs in the adaptation 'machinery', and that understanding institutional adaptive management (and the determinants of adaptive capacity) is vital in any study of adaptation to climate change and variability. In the case of the Guadiana river basin, both Spanish and Portuguese national policies have identified an increase in water storage capacity and inter-basin water transfers as the main options in order to deal with the problem of water availability (Cots et al. 2007). However, reliance on technical or hard engineering solutions can only be a partial solution, particularly when factoring in the climate change dimension and the myriad of transboundary issues and competing sectoral interests that also need to be considered in order to address the problem of strongly erratic flow and its adverse consequences (for instance, decisions taken in a sectoral arena can have significant repercussions for water demand). Even without factoring in climate change, water scarcity is already an existing and acute problem in the transboundary region – this will intensify over time. As most programmes covering regional development (or even specific sectors such as agriculture, tourism etc) tend to be either national or regional in scope, nested and multi-level strategies and policies will ultimately be needed to ensure the sustainable use of water resources in the longer term. Ultimately, any adaptation framework will need to consider and balance a range of different options, with clear responsibilities designated to many different stakeholders.

It has been argued in this paper that a more informed multiple goal response is possible by recognising the value of flexible and inclusive institutions which build on the plurality of different local perspectives and enable the exchange of knowledge and resources between different actors and communities of practice. In a transboundary context, bridging organisations that facilitate communication and learning across territories, scales, sectors and the public / private divide, can serve as innovative platforms for multi-scalar cooperation and the coming together of actors to exchange knowledge, refine practice, and ultimately work together towards solving common environmental and resource management problems (i.e. a move from management as control to more adaptive management in a learning environment). In this regard, new institutions in the Guadiana region, the activities of GIT for instance, hold promise for acting as catalysts of change and for encouraging a process of 'learning to adapt' within a transboundary context.

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Fighting Floods or Living with Floods? Striving for Coherence in Multiple Strategies of Flood Risk Management in European River Basins

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Abstract: The high flooding of various European rivers in the recent decade and the growing awareness of global climate change have made local and supra local governments realize that flood protection will not remain adequate in the near future by endlessly increasing the height of dikes, channeling river courses, constructing dams or taking other sorts of river- constraining measures. Instead, rivers need more space in order to allow the discharge of more water at a lower water level. In addition, rather than strictly separating the rivers' functions from those of the surrounding floodplains, there is increasing support for the idea to combine the rivers' hydraulic functions with other land use types such as agriculture, nature, recreation and housing in such a way that all functions will be enhanced. Likewise, given that political boundaries often do not match with hydrological boundaries, there is also a need for the establishment of joint institutions for river basin management to avoid counteracting measures and deal with different aspects of flood risk management in all countries sharing the same river basins. The aim of this paper is to discuss organizational networks for, and recent approaches towards, flood risk management in European river basins. Special focus will be on the *Living with Floods* approach in the Netherlands and its associated implications for international policies and institutional arrangements.

4.1 Flood Management in European River Basins: An Introduction

The European Union experiences loss of life and serious damage through flooding nearly every year. Likewise, constraints and losses in agricultural production as a result of too little water do regularly occur and are equally devastating. It is expected that flooding will become more frequent and extreme in the 21st century, based on predictions that climate change will lead to higher total winter rainfall and more intense precipitation events (Middelkoop et al. 2004, 2001; Pfister et al. 2004; Cubasch and Meehl 2001; Disse and Engel 2001). Likewise it is expected that the Rhine will change from a "rain-fed plus meltwater" river into a "mainly rain-fed" river (Kwadijk and Rotmans 1995). Whether there will be more severe or frequent streamflow droughts is still uncertain. There is a lack of clear evidence, as concluded by Hisdal et al. (2001) after analyzing a long-time series of 600 streamflow records from the European Water Archive (see also de Wit et al. 2007). However, with most hydrological simulations suggesting an increase in flood probability in the Rhine-Meuse river basins, there is an urgent need to work towards improved flood risk management in order to avoid the occurrence of devastating flood events like those in 1993 and 1995.

In Europe, river management has been practiced since ancient times but more extensive measures of flood protection are from more recent date. For example in the Netherlands, various polders (e.g., the Mastenbroek polder developed in 1362 and the Eemland polders between 1000 and 1600) and closed river dike systems date from the Middle Ages or even earlier (Beleids Nota Belvedere 1999). Major hydraulic works, such as, the damming for flood control, progressive straightening and deepening of channels for navigation, and settlement of floodplains were started a few centuries later, i.e., mostly in the 1800s (e.g., Trémolières et al. 1998). At that time, river basins were primarily seen as resources to be developed. For example in Germany, the Rhine was connected to the Donau by the Ludwig-Donau-Canal in 1846 whereas in eastern France, the river was straightened in the 1850s, deepened in 1880 (Disse and Engel 2001), and its flow canalized between 1928 – 1932 and 1950 – 1970 (Trémolières et al. 1998). It was not until the 20th century that most national hydrological services initiated their systematic observation and collection of water-related data (Brázdil and Kundzewicz (2006). For example, the daily-discharge records for the Meuse date back to 1911 (de Wit et al. 2007), and the regular-flow records for the Rhine to 1817 (Disse and Engel 2001).

Increasing awareness of flood risk (defined as the probability of a flood multiplied by the damage) has been a main driving force for advances in river control measures and development of flood prevention and protection policies. Whereas initially such advances were instigated and coordinated at national level, i.e., within river districts or national

water management bodies, by the 20th century international river commissions were set up to oversee the multiplicity of control measures within transboundary river basins. Most national governments realized that unilateral development can create problems in international river basins (Mostert 2003). Strategies for flood risk reduction do not stand alone but should be considered within the context of all river functions (i.e., nature, agriculture, inland navigation and landscape values) and the needs, cultures and perceptions of communities and countries being part of the river basin. It is clear that reaching an agreement about best practices of flood risk management partly depends on the effectiveness of international co-operation and is a rather complex, long-term process. The time to reach such agreements in the past varied from ten up to thirty years (Scheldt River and Meuse River) and even more than 100 years (Alpine Rhine; Mostert 2003).

The aim of this paper is to 1) describe recent approaches, in terms of organizational frameworks, towards flood management in European river basins (i.e., restricted to those covering parts of the Netherlands: the Rhine, Meuse and Scheldt basins), 2) discuss various views on flood risk management and 3) determine associated implications for international policies and institutional arrangements. The *Living with Floods* approach will be discussed as a special case study within this context. Before addressing the major aims of this paper, an overview of the hydrological characteristics of main West-European river basins will be given.

4.2 Characteristics of European River Basins: The Rhine, Maas and Scheldt

The Rhine River is Western Europe's largest river basin, with an area of 185,000 km² (Table 4.1) and mean annual discharge of 2,200 m³s⁻¹ (minimum: 620 m³s⁻¹ and maximum: 13,000 m³s⁻¹, Berendse 2005; 2,062 m³s⁻¹ at Cologne, Disse and Engel 2001). Rising in the Alps, it flows from the Swiss mountains through Liechtenstein, Austria, Germany, France to the Netherlands. In the Netherlands, it splits into three tributaries: the Waal, Lek and IJssel rivers. Small sections of the Rhine river basin are located in Italy, Luxembourg and the Walloon region of Belgium. Navigable from Rotterdam to Basel, the Rhine is one of the most important transboundary waterways in the world. Human settlements and major industrial areas have occupied its banks for centuries, and one of the world's densest road and railway networks follows its course. The Rhine further provides irrigation water for intensive agriculture, including vineyards producing highly-prized wines.¹ Given its important role in multiple functions, it is not surprising that the (potential) impact of climate change on the river's flow conditions and multiple functions are carefully investigated and monitored. Within this context, Middelkoop et al. (2004) conclude that the influence of climate change on extreme floods is much stronger than the influence of land-use changes, at the scale of the entire Rhine basin.

Table 4.1 Characteristics of main rivers in the Netherlands

Characteristics	Scheldt	Rhine	Meuse
Length of river (km)	350	1324	925
River basin size (km ²)	21,863	185,000	33,000
Annual flood discharge (m ³ s ⁻¹)	107	2,200	250
Annual min – max discharge	43 – 207	620 – 13,000	30 – 3,000
Origin	France	Switzerland	France
Number of countries in basin	3**	6*	3**

* Switzerland, Liechtenstein, Austria, France, Germany, Netherlands
 ** France, Belgium, Netherlands

The Meuse River originates in Pouilly-en-Bassigny, France, and flows through Belgium into the Netherlands. At Heusden, it flows west via the Bergsche Maas canal and the Amer river to the Hollands Diep estuary and then into

1. http://www.grid.unep.ch/product/publication/freshwater_europe/rhine.php

the North Sea. The river basin covers an area of about 33,000 km² and is characterized by a temperate climate. The Meuse River is a typical rain-fed river, with low flows during summer and high flows during winter. Its mean annual discharge is 250 m³s⁻¹ (minimum: 30 m³s⁻¹; maximum: 3,000 m³s⁻¹; Berendse 2005). The average annual discharge shows however strong fluctuations, with for example the average 1966 discharge being about 6 times larger than the average 1976 discharge, as recorded at Borgharen (De Wit et al. 2005). The Borgharen records likewise show that most of the largest floods in the Meuse have occurred during the last decade. Tu et al. (2004 in De Wit et al. 2005) further showed that both annual maximum daily discharge and extreme precipitation depths have significantly increased since the early 1980s.²

The Scheldt River originates in northern France and flows through Belgium to the Western Scheldt in the Netherlands and to the Sea Scheldt in Belgium. The river's annual discharge is 107 m³s⁻¹ (average for 1949–1998. at Schelle, Taverniers 1999; see also Meire et al. 2005) and its drainage basin covers an area of about 21,000 km²; Steen et al. 2001; Meire et al. 2005). Already since the 16th century the Scheldt and its estuary have been a source of political conflict particularly between Flanders (Belgium) and the Netherlands, given their multiple functions serving many stakeholders. The Scheldt is a very important water way for shipping and for the Antwerp harbor area, the latter being in strong competition with the harbors of Amsterdam and Rotterdam. The Scheldt is also important to the fishing industry; there are commercial fishing operations on both the Western Scheldt and the Sea Scheldt, though to a limited extent. The Scheldt estuary, having a tidal range of six meters, is further unique from an ecological point of view. The transition from fresh to salt water, including a 60-kilometre freshwater tidal area and the flora and fauna species diversity associated with it, make the Scheldt estuary an exceptional system. It is one of the most important estuaries along the NW-European migration route for water birds (Meire et al. 2005), with the Western Scheldt serving an important function as a spawning area.³

4.3 Establishment of Organizational Frameworks for European Flood Risk Management

One way to achieve flood risk management within transboundary river basins is to work towards the establishment of an organizational framework for management. International and regional organizations often play such an important role. They commonly consist of a general assembly with high-level civil servants, working groups on specific topics with representatives of governmental and non-governmental organizations, ministerial conferences and an independent secretariat (Mostert 2003). Examples include the Rhine, Danube (Donau), Meuse and Scheldt commissions. Their tasks and objectives are related to the integrated protection of river basins or other fresh water resources. If well-designed, such organizations can facilitate further co-operation. Some examples are discussed below. Commissions like these, however, are usually strictly intergovernmental and have little decision-making power but nonetheless provide a platform for all parties and serve as medium for communication (Mostert 2003). In addition to these river-bound organizations, some regional organizations are active in the river and flood risk management. The best known of these regional organizations is the European Union. The EU has issued various directives on water management, which are binding upon its Member States and the candidate countries. In December 2000, it published the Water Framework Directive. This directive requires participatory river basin management planning for all national and international river basins in the EU, as will be discussed below.

International Rhine Commissions

The Koblenz-based International Commission for the Protection of the Rhine (ICPR), an initiative of Switzerland, France, Luxembourg, Germany and the Netherlands, was set up in 1950 in the form of a permanent intergovernmental body to handle general pollution issues.⁴ The ICPR created the legal basis of this cooperative partnership with the Bern Convention of 1963. The European Community affiliated itself to this convention in 1976 and in 1987 the River Rhine Action Programme (ICPR 1987) was established. The latter had a specific ecological goal of returning the Rhine's higher trophic-level species by improving water quality. In 1992, the ICPR launched the "Ecological Master

2. http://www.knmi.nl/publications/fulltexts/bregenz_copy1.pdf

3. <http://www.verkeerenwaterstaat.nl>

4. <http://www.iksr.org/index.php?id=295>

Plan for the River Rhine: Salmon 2000” directed at an integrated ecosystem approach (ICPR 1992). In 1999, the Bern Convention was replaced by the new Convention on the Protection of the Rhine. This convention focuses on the protection of the Rhine against chemical pollution, the ecological values of the Rhine, and on flood risk management. In January 2001 the Conference of Rhine Ministers in Strasbourg led to the adoption of the program for sustainable development of the Rhine (“Rhine 2020”) and discussed the manner in which the various stakeholders could cooperate in implementing the European Water Framework Directive. The Coordinating Committee Rhine & Water is nowadays responsible for coordinating the implementation of the European Water Framework Directive and sees to its coordination with the new ‘Rhine 2020’ program.⁵ On the 18th of October 2007, the 14th Conference of Rhine Ministers was held in Bonn, Germany, addressing amongst others strategies to adapt water management at times of low and high water level due to climate change (ICPR 2007).

The International Commission for the Hydrology of the Rhine Basin (CHR) based in the Netherlands deals with the hydrology of the Rhine. Here various scientific institutes of the Rhine riparian states formulate joint hydrological measures for sustainable development of the Rhine basin.

Finally, in addition to the activities of the International Rhine Commissions, the European Commission has made many efforts to come to an integrated ecosystem enabling a rich variety of animal and plant life to thrive in the Rhine basin. In 1998 the ministers of the European Commission set targets to restore natural areas as part of a single ecosystem stretching from the mouth of the Rhine to the Jura, the Alps, the Rhine mountain range, the old softwood forests of the floodplains and streams of the Rhineland-Palatinate, the Black Forest and the Vosges.⁶

International Meuse Commission

In 1998 the Meuse Treaty, i.e., an agreement between France, Luxembourg, Germany, the Netherlands and Belgium regarding the protection of the Meuse River, became effective. The next Meuse Treaty signed in Ghent in 2002 lays down rules for the implementation of the European Water Framework Directive and stipulates the tasks of the International Meuse Commission (IMC). The latter commission was created at the time of the 2002 treaty to oversee the implementation of those activities referred to in the treaty. Based in Liège, the IMC has as its most important tasks:⁷

- Coordinating the obligations of the European Water Framework Directive;
- Providing advice and recommendations to parties for improved flood prevention and risk management;
- Providing advice and recommendations to parties for preventing and combating water pollution (warning and alarm system).

Established in 2004, the Flemish-Dutch Meuse Commission addresses issues regarding water quality, water quantity (e.g. water shortage, flooding) and shipping.⁸

The Technical Scheldt Committee and the International Scheldt Commission

With the installation of the Technical Scheldt Committee in 1948, Dutch and Flemish politicians were provided with permanent consultation on technical issues such as water infrastructure and management in the Scheldt region. More recently, one of the major issues of the committee has been directed at the widening and deepening of the of the Scheldt navigation route and at the development of a long-term vision for the Scheldt estuary. In March 2005, with the approval of the Scheldt Estuary Development Outline 2010, Flanders and the Netherlands have come to agreements on the main issues of the safety in the Scheldt basin, the sustainability of a dynamic, healthy natural environment and the accessibility to the harbors on the Scheldt estuary. The Antwerp-based International Scheldt Commission was established only in 1994 among France, Belgium and the Netherlands⁹ and addresses the protection of the water quality and the implementation of the European Water Framework Directive (with the treaty of Liege in 2001; Peeters et al. 2007). Moreover, large parts of the Scheldt estuary have been designated as special areas of conservation under the European Bird (79/409/EEC) and Habitat Directive (92/43/EEC) respectively (Meire et al. 2005). It is clear that the

5. <http://www.verkeerenwaterstaat.nl>

6. http://www.grid.unep.ch/product/publication/freshwater_europe/rhine.php

7. see also: <http://www.meuse-maas.be/page.asp?id=14>

8. <http://www.verkeerenwaterstaat.nl>

9. <http://www.verkeerenwaterstaat.nl>; see also: <http://www.isc-cie.com/>

future status of the Scheldt and its estuary highly depends on the adequate implementation of the legislation that supports integrated management to safeguard and balance the multiple anthropogenic and ecological functions of these resources.

The European Water Framework Directive

In 1995, European institutions agreed that a fundamental review and restructuring process was needed for the Community's water policies and in February 1997 the Proposal for a Water Framework Directive was adopted. Its purpose is to establish a framework in order to achieve the following main objectives of a sustainable water policy:

- Sufficient provision of drinking water
- Sufficient provision of water for other economic requirements
- Protection of the aquatic environment
- Alleviation of the adverse impact of floods and droughts

Whereas the Directive expands the scope of water protection to all waters (inland and coastal surface waters and ground water), it strives to achieve sustainable water use throughout Europe and a "good status" for all European waters by 2015. It further formulated a set of requirements directed at the need for cross-border co-operation between countries and all involved parties, active participation for all stakeholders (and involving citizens more closely), water pricing policies ensuring adequate incentives for water users to use water resources efficiently (i.e., the polluter pays), water management based on river basins, streamline legislation, and balancing the interests of the environment with those that depend on it (Directive 2000/60/EC, EC 2000; EC 2007). To achieve these goals and requirements, a sound river basin management should be established. The administrative procedure to implement this river basin management is however left to the discussion of the Member States themselves.

4.4 Different Views on Flood Risk Management Strategies

From the previous discussion on European commissions tasked with the management of river basins or water in general, it becomes clear that increasingly these commissions see the role of water management no more in terms of increasing water supply or reducing flooding but rather as balancing water demand and supply and managing flood risks. A main concern is the integrated protection and management of the river basin as a whole (Moster 2003). This observation is shared by various publications presenting different views on how to distinguish among past, present and future management strategies and how to achieve agreements on this matter among European states. Some of these views are discussed below.

Perspectives on Flood Management: The Egalitarian, Hierarchist and Individualist styles

Rivers serve multiple functions such as nature, agriculture, inland navigation and landscape values. Hence the development of a flood management strategy should ideally be based on an integrated approach in which both biophysical and socio-cultural aspects are being addressed. The perspective method discussed by Middelkoop et al. (2004) is an example of such an integrated approach based on cultural theory (Thompson et al. 1990) and developed by the TARGETS research group at RIVM in the Netherlands (Rotmans and De Vries 1997). A perspective in this context is defined as "a consistent description of the perceptual screen through which people interpret the world, and which guides them in acting" (Middelkoop et al. 2004). There are in fact three types of "perceptual screen descriptions", one focusing on environment (Egalitarian), one on control (Hierarchist) and another one on economy (Individualist). Each of these perspectives comprise both a world view (how people interpret the world) and a management style (how they act upon it) and by making different combinations of worldviews and management styles, a matrix of perspective-based scenarios can be developed (or existing scenarios can be interpreted and tested). An "utopia" refers to a scenario in which the world view coincides with the management style and a "dystopias" to a scenario in which the world view differs from the management style.

Analyzing European flood risk management styles, Middelkoop et al. (2004) conclude that both the Germany and Belgium styles have common characteristics with an Individualistic style, whereas the Dutch style complies with a Hierarchist style. They further state that under conditions of climate change, the latter style runs the risk of becoming an expensive attempt to fully control flood risk problems in lower river reaches, without actually solving the problems

in the long view. Yet, no flood risk management strategy proved superior in all respects and circumstances and safety versus societal costs is considered a policy dilemma: win-win situations cannot always be attained. If the Hierarchist style proves to be more expensive than the Egalitarian style, the latter is advocated because it yields more safety and nature at lower costs. If the Hierarchist style appears more risky than the Individualist style, then the latter is preferred because it is less costly and leaves more room for other river functions.

“From Potential Conflict to Potential Cooperation” Strategy to Reach Agreements

Difficulties of reaching agreements among river basin states to solve flood risk management issues are related to inequalities in expertise, internal conflicts of interests, lack of trust that parties will respect agreement obligations, and limited capacity to enforce these obligations. Mostert (2003) discusses the “from potential conflict to potential cooperation” strategy of dealing with these difficulties and achieving agreements in transboundary resource management, reviewing developments in international freshwater management based on 35 case studies conducted at various continents (i.e., Africa, Asia, Europe, Australia, North and South America). Mostert refers to the potential for international water resources to become a catalyst for regional peace and development by means of more dialogue, co-operation and participative management of the resource. Developing and maintaining good international relations proved to be the most common and the most powerful strategy for reaching agreements in sustainable flood risk management. Issue linkage, i.e., making the resolution of one issue dependent upon the resolution of another, is presented as a strategy to overcome conflicting interests. An example given by Mostert within this context is a Belgium request to deep the Scheldt River in the Netherlands in order to increase maritime access to the port of Antwerp in 1967. The Netherlands agreed to do this provided that two other issues of Dutch interest would be addressed: the pollution in the Scheldt River and the water allocation in the Meuse. Internal conflicts in Belgium hampered this deal (the resolution of the pollution problem depended on measures in Wallonia whereas the main beneficiary of the deal, i.e., the port of Antwerp, is in Flanders). The final resolution in 1994-1995 was due to linkage to issues outside the water sector like the routing of the high-speed railway line from Antwerp to Rotterdam (Mostert 2003). An alternative to issue linkage is the funding of measures in one country (e.g., upstream) by the beneficiary country (e.g., downstream) in order to solve issues in the latter like the payment of measures by the Netherlands and other basin countries to reduce pollution caused by potassium mines in France. Control over the implementation of an agreement is another important concern. This is particularly true where river basin states are under pressure and lack mutual trust while the resolution of an issue depends on measures to be taken in sequence by the states in question. Agreements may not be reached, or measures not be implemented, because of uncertainty whether other states will honor their obligations (Mostert 2003). Finally, the participation of sub-national governments, river basin resource users and other local stakeholder is crucial for effective flood risk management, and river basin management in general, and may increase awareness of the issues raised and increase public support for the implementation of agreed measures.

Resilience and Resistance Strategies for Flood Risk Management

The Hierarchist style of flood risk management explained above corresponds to one of the strategies for flood risk management discussed by Vis et al. (2003): The resistance strategy. This strategy is directed at reducing risks by river training and construction of embankments, i.e., measures aimed at the reduction of flood hazards or the frequency of flooding. It has, however, a number of disadvantages (De Bruijn and Klijn 2001). Firstly, the strategy is based on a so-called “design discharge”, i.e., the discharge capacity of a river (determined every five years from collected information on discharges and the river’s morphology) that allows a safe passage of a discharge with a probability of 1/1250 per year. The design discharge thus entails one safety level applied for the whole area implying that all land use types have the same probability of flooding (Vis et al. 2003). Secondly, the strategy gives little attention to the consequences of possible floods. Potential flood damage has increased over the years: industries, housing and various types of infrastructures (roads, railways, etc.) have been developed in formerly flood-prone areas nowadays protected by closed dike systems. Yet the dike systems give a false sense of safety, considering that these systems may break if not properly maintained or if affected by unforeseen processes (e.g., drought that may lead to cracks in dike systems) that weaken the dike structures like in 2003 near Wilnis in the Netherlands.

The other strategies discussed by Vis et al. (2003) are directed at minimizing the consequences of flooding or learning to live with floods, i.e., resilience strategies. These strategies focus on “living with floods” instead of “fight-

ing floods” (De Bruijn and Klijn 2001). They thus rely on risk management rather than hazard control, allowing flooding in certain areas while at the same time the adverse impact of flooding is minimized by adapting the land use and spatial planning in flood-prone areas. The development of new housing and industrial areas, for instance, are kept out of zones with high flood risk.

Flood risk, which is a function of flood probability and potential damage, is not only increasing because of climate change (causing more extreme discharges) but also because of the increased investments in areas at risk of flooding. It is believed that the most effective and sustainable reduction of flood risk can be achieved by reducing potential damage in flood-prone areas through adapted land use and spatial planning (Hooijer et al. 2004). The translation of flood management into spatial plans and policies can be facilitated by dividing a river basin into different action areas, each holding a different set of required actions. This approach is followed for example for the Rhine basin which is divided into eight action areas based on three criteria, i.e., prevailing flood danger, geophysical situation, and possible effects of retention measures (Böhm et al. (2004). The actions assigned to each area form together the framework for regional flood risk management in the Rhine basin and provide a systematic approach towards spatial planning needed to regulate land use in flood-prone and detention areas. Thereby a distinction is made between priority zones and reserve zones, the former directed at preventing increased vulnerability in high risk zones and the latter at delivering restrictions and demands on precautionary measures concerning constructions.

The systems of spatial planning in the countries of the Rhine basin show not only similarities but also differences in planning instruments and application (Böhm et al. 2004). Whereas in the Netherlands, Germany and Switzerland instruments for land-use control are available at the regional level (province, land/region, canton), in France the regional administrative bodies (région/département) have no authority for setting up binding land-use planning targets at the municipal level; it is the state that has the instruments for land-use control. Furthermore, in regional spatial plans, different focuses are set on individual fields of actions, which often fail adequate correspondence to the demands of individual action areas, being derived from differences in national planning systems and cultures. For example Böhm et al. (2004) report that in Switzerland the regional plans concentrate on “minimization of damage potential” because of the region’s legal focus whereas “the protection of existing retention areas”, also of high importance in this country, is hardly considered. In Germany, much attention is given to “the preservation of existing retention areas” by defining priority zones for areas safeguarded under water laws but contributions to the “the extension of retention areas” are not identified. In the Netherlands, “the protection of existing retention areas” is likewise addressed in land use plans but in this case through the function of “nature conservation and development”; “the extension of retention areas” receives little attention.

Integrated Flood Risk Management

Taking into account some, if not all, of the views discussed above, integrated flood risk management is based on a more holistic, comprehensive view, rather than a sectoral view, of managing flood risks in river basins. The main reason for this is the assumption that flood risk management is only sustainable if integrated with all other river management objectives because, whether unintentionally or not, measures of flood risk management will affect other planning objectives in fields of socio-economic, cultural and ecological development of river corridors as well. The latter also explains why the integrated approach is rather complicated and may delay the implementation of management measures, particularly where land acquisition is required to create space for rivers and allow for ecological rehabilitation. The translation of a long-term basin-wide view into a sound integrated management action plan, in which local solutions must meet the requirements of both a comprehensive strategy and local requirements, reveals that a win-win solution meeting requirements of all stakeholders alike cannot be found at all times (Hooijer et al. 2004). Some form of resistance will always be met, particularly where measures need more space laterally covering habited and inhabited areas, as suggested in the space-for-the-river strategy discussed below.

4.5 Living with Floods: a contemporary approach towards flood management in the Netherlands

Recent ideas for flood management in the Netherlands have been instigated by the concept of nature restoration and development in riverine areas. The concept promotes the creation of more space for natural processes in flood plain

areas (Cals et al. 1998). Two major plans, both launched by Non Governmental Organisations, i.e., the 'Black Stork' (De Bruijn et al. 1987) and 'Living Rivers' (WWF 1993), have formed the basis for this concept. Along the same line, the concept of resilience translated by De Bruijn and Klijn (2001) into "living with floods" has been introduced in the field of flood risk management. The concept, originating from ecology, has been described as a measure of persistence of (eco-) systems and of their ability to absorb change and disturbance while maintaining the same relationships between populations and systems' or state' variables. It refers to the ability of a system to recover from a disturbance and persist, i.e., a strategy that also is characteristic for natural ecosystems in flood prone areas. In terms of flood risk management resilience refers to attempts to minimize potential flood damage through adjustment of land use and spatial planning, as discussed earlier, whereas in addition measures may be taken to accelerate the recovery after flood events (Vis et al. 2003).

The current policy of the Dutch government is to allow rivers to take more physical space during events of extremely high discharges and high water levels, as stipulated in the space-for-the-river program (VROM & V & W 1996; V & W 1998). Thus instead of gaining land from rivers and sea, as practiced over many centuries, the Dutch approach today is to give land back to rivers and sea.

Compensation Measures in the Space-for-the-river Policy

The transition towards the space-for-the-river strategy has had far reaching consequences for the management of river areas. Actions resulting in a water-level raise (e.g. house construction, wetland reclamation) must be compensated for in a sustainable manner. This has resulted, amongst others, in controlled flooding of compartments of limited size. The compartments are areas along a river designated for temporary water storage, with large dike-enclosed continuous areas divided into smaller compartments with different flood probabilities (Vis et al. 2003). The compartments with high flooding probability are preferably situated where economic damage is limited, such as in agricultural or nature areas, whereas compartments with low flooding probability are usually near urban areas. Along this line Nienhuis and Leuven (2001) refer to different types of compensation measures, including the removal of obstacles in river beds (to allow for a quick river peak flow down to sea), the rebuilding of winter dikes land inward, the lowering of river floodplains by excavation over large distances, the creation of inland retention basins and inundation fields, the creation of calamity polders, spillways and overflows, and the use of inland abandoned land to retain water during extreme flood events.

Another measure arising from the space-of-the-river-policy is the lay-out of so-called green rivers Vis et al. (2003). These are wide compartment areas that are dry and green (i.e., vegetated) most of the year but where the probability of flooding has been increased and consequently is high (varying from once a year to once every ten years) in order to facilitate the river's discharge capacity. The green river strategy include three variants: the spontaneous development variant (few structures are made and nature develops without interference by man), the biodiversity variant (active interference by man to steer the development of vegetation and different habitat types in nature-poor river areas), and the multifunctional variant (adjustments are made in order to allow for other functions than nature such as outdoor sports and agricultural activities).

The efficiency of the above measures are still under investigation whereas new measures are being developed and debated, with some measures appearing controversial at first sight such as flood control measures and ecological rehabilitation (Nienhuis and Leuven 2001). More not all measures work as expected. A Ministers' communiqué brought out during the latest Conference of Rhine Ministers in October 2007 reported that the water retention measures taken since 1995 along the Rhine failed to result in a targeted extreme-flood-peak reduction of 30 cm. It was concluded that the effect of retention measures distinctly diminishes with increasing width of the river downstream (ICPR 2007).

Complexities of Implementation

Discussing the complexity of implementing the policy innovations of the space-for-the-river policy program, Van den Brink and Meijerink (2006) point at four forms of the (resource) interdependencies in the river policy domain. Firstly, interdependency is created through the division of formal decision making power among stakeholders in a river basin. While, like in the Netherlands, the national government may have the ultimate decision making power, adequate river basin management largely depends on the cooperation among (trans-) national, regional and local stakeholders. The latter possess power through crucial resources such as competencies in the field of spatial planning for the actual

implementation of compensation measures and access to media through which they can frustrate decision-making and prevent the implementation of policies they do not support.

Another form of interdependency is created by the often unequal distribution and accessibility of financial resources. Those stakeholders bringing in most of the financial resources (i.e., the state in the Space-for-the-river program) tend to have the highest influence on what objective to meet first (e.g. safety for inhabitants in river areas prior to economic development) and, on the basis of this, what type of compensation measures be given priority. The third type of resource interdependency is related to the distribution of expert knowledge among river basin stakeholders, whereas the fourth type is created by the cross-border hydrological relationship between upstream and downstream areas. The former type may entail conflicting views on flood risk management among stakeholder groups, with each group defending an approach based on its priority setting and expert knowledge. Approaches towards flood risk management are dynamic and change over time. An example is the change from traditional high-tech flood defense structures designed by water managers prioritizing water safety towards multi-functional land use in river basins promoted by spatial planners for whom improving spatial quality of river landscapes has first priority. The up- and downstream interdependency, and its effects on water policy making and implementation, can be illustrated by the debate on the future discharge of the river Rhine and the need to construct emergency flood polders in the Netherlands (Van den Brink and Meijerink 2006). Some believe that, once the Rhine exceeds future norm discharges (16,000 and 18,000 m³ s⁻¹ in 2015 and >2050 respectively), the sparsely populated polders need to be purposefully flooded (after evacuation) to protect the densely populated areas in the Netherlands. Others, however, argue that the prediction of future norm discharges for the Rhine are unrealistic reasoning that discharges at such rates would lead to large-scale flooding in Germany, and hence, lower Rhine water levels in the Netherlands. The opposing perceptions of the impact of future Rhine floods have resulted in a postponement of the emergency flood polder construction.

Vis et al. (2003) evaluated the financial impacts in terms of costs and flood damage for the compartment strategy and the three green-river variants. The initial costs of all resilience strategies proved to be high, especially in the short term, while the profit (the decreased flood risk) is only perceivable in the long term. The green rivers with biodiversity development proved particularly expensive because of the large (and expensive) space needed and great changes in land use (PV of 8 billion Euro). Continuation of the current resistance strategy proved least costly (PV is 0.9 billion Euro), yet may result in rare but enormous economic flood damage ranging from 1.5 to 36 billion Euro. Thus although flood risk management based on resilience is a good, more flexible alternative for the current policy of increasing resistance against flooding by raising the dikes, the financial benefits are limited. Whereas they offer more opportunities for nature and landscape development, it is questionable whether these opportunities counterbalance the high initial costs and the to-be-long-awaited-for benefits of decreased flood risk. In addition, it is a complex, if not impossible, task to divert from the traditional institutional path of hierarchical decisions making and fighting water through technical engineering and works towards a new institutional path of interactive modes of governance and river management through the resilience-based strategy of creating more space for rivers (see also Van den Brink and Meijerink 2006).

4.6 Discussion and Conclusion: Implications for Policies and Institutions

The different views and approaches presented in this paper leads to the conclusion that an integrated, multiple objective policy planning process is needed to come to successful implementation of flood risk management in both, national and transnational, river basins. In addition to this, the participation of all stakeholders from the start is a prerequisite for efficient and sustainable flood risk management. The public perception is important because it often is directed at a reduction of flood probability rather than an overall risk reduction that governments consider as their main objective of flood risk management. In this context, communication and awareness raising about flood risk management and its multiple objectives are imperative. Another complicating fact is that existing perceptions and approaches of the “best” strategy for flood risk management are related to differences in world views and management styles among river basin countries and may not correspond with “best” outcome of an integrated cost-benefit analysis of alternative strategies and thus needs investigation. Likewise, the “best” outcome will vary for river basins depending on topographical and geophysical conditions, and therefore needs validation in terms of field research. The “best” outcome is ideally based on priority targets agreed upon internationally by the concerned river basin states and associated stakeholders jointly and comprises a balanced combination of measures and instruments.

The discussion of the literature on flood risk management likewise presents various ways of preventing extensive delays and facilitating the process of reaching consensus among river basin states on adequate and efficient policies and policy implementation. These include moving from potential conflict to potential cooperation strategies and linking the resolutions of interdependent issues as a way of overcoming opposing interests and incorporating spatial planning by formulating different action areas and associated requirements as a means of translating flood risk management into a framework of activities for a given river basin.

Changing peoples' views, behavior and approaches towards flood risk management is not an easy task, particularly where risk is involved and traditional values and customary conducts are strongly embedded within society. Yet the case study of the Netherlands exemplifies that changes within this field are not beyond reach. From "fighting floods" and "gaining land from rivers and sea", as practiced in the past, the Dutch changed their approach towards "living with floods" and "giving land back to rivers and sea" in recent times. Water management changed over time as knowledge extended, allotted river functions varied and technology developed, and is expected to be adjusted again, with the ongoing climate change — and its effect on river discharge and flow behavior — as the main catalyst for improving flood protection.

Note:

Water has given rise to many conflicts all over the world. Moreover, many fear that these conflicts may worsen in the near future based on population growth and predictions of a 20-percent reduction in per capita water availability by 2025, as a result of which nearly half of the world's population will live in moderately or heavily water-stressed countries (Cosgrove and Rijsberman 2000). The World Water Vision presented at the Second World Water Forum and Ministerial Conference in The Hague in March 2000 also strengthened this fear referring to the existence of "a water crisis that only gets worse if no action is taken".

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From High Seas Fisheries to Marine Environmental Protection: A Transformation on Policy

Kuan-Hsiung Wang

Abstract: Globalization has already become an important phenomenon in modern internationalized society. The phenomenon is demonstrated production flows with an unprecedented speed and scale. Although globalization has been witnessed for several decades, it is still being debated whether if globalization will cause the collapse of national boundaries, or if states will disappear in the future because their functions have been restricted. Previous discussions or debates on globalization emphasize international financial transactions, technology flows, transnational co-operation, capital flows, cross border movements of people, and so forth. States are getting more interconnected and share common interests. As a consequence more functional fields of interaction, but also more disputes, are emerging. The chapter examines the development of high seas fisheries and environmental protection. The chapter finds that national sovereignty has been challenged by the above mentioned trends. Evidence comes from daily economic life, but also from the development of an international legal system, especially related to high seas fisheries and international environmental protection. The chapter concludes that globalization does not inevitably result in the elimination of national boundaries but rather that interdependence increases in areas like international organizations, trade in fish products, and the state of the environment. A great number of international policy instruments, such as conventions and treaties have been developed to protect fish stocks. These instruments should be used in an integrated mechanism so that the policy objects can be accomplished. The following elements are necessary for an ocean governance to proceed: harmonization of national legislations and regulations of fisheries and environmental protection, transparency in national policies, cooperation among states in relevant fields and contributions to be made by international organizations, either IGOs or NGOs.

5.1 Impact of Globalization on Sovereignty

Globalization in modern international society is evidenced, for instance in the economic sphere, which is characterized by an unprecedented speed and scale of flow of commodities. However, globalization does not mean the inevitably elimination of national boundaries. Rather it implies that members of an internationalized society increasingly depend on each other, especially where it concerns the development of international organizations, international trade in fish products, and other environmental issues.

There are a great number of international policy instruments, such as conventions, and treaties that have been developed to protect fish stocks. These instruments, however, should be used in an integrated mechanism, compatible with national, regional, and other global mechanism, so that policy objectives can actually be accomplished.

Globalization are multifaceted processes, primarily of global financial markets in which ever vaster sums are exchanged with increasing speed of movement, and of global actors, such as transnational corporations and the owners of huge media empires, whose power and wealth may exceed that of many governments. Multinational corporations, for instance, move components or semi-finished products in between different countries and even assemble them across the globe. In recent decades the production and delivery of single services has also been multi-nationalized. For instance, law, accounting, and advertising companies operate internationally and the same popular culture can be experienced all over the world, as if the world were borderless (Kegley and Raymond 2005: 272; Armstrong et al. 2004: 214).

The role and power of state authorities seem to be diminished as functions that used to be under its control, now become less relevant. For instance, in case of the SARS crisis, vulnerable states' actions were in vein unless their efforts were part of a cooperation with other states in similar conditions. Despite the need to cooperate, or relinquish control of sectors previously under government monitoring, members of the world community agree on the necessity of nation-states to offer its nationals identity, raise taxes, provide social safety nets, protect the environment, guarantee national borders, and protect the national and international order with the threat or actual use of military forces (Kegley and Raymond 2005: 272).

Hence, globalization creates a paradoxical situation: States have to cooperate with each other and relinquish supervision over certain sectors, but they still have to maintain some traditional functions. Supervising and regulating the fishing industry is one of them. Since the end of the WWII, rapidly changing technologies have made fishing considerably more efficient and increased capture capacity. The import and export of fish and fish products is an important area for national governments, in who's jurisdiction it takes place.

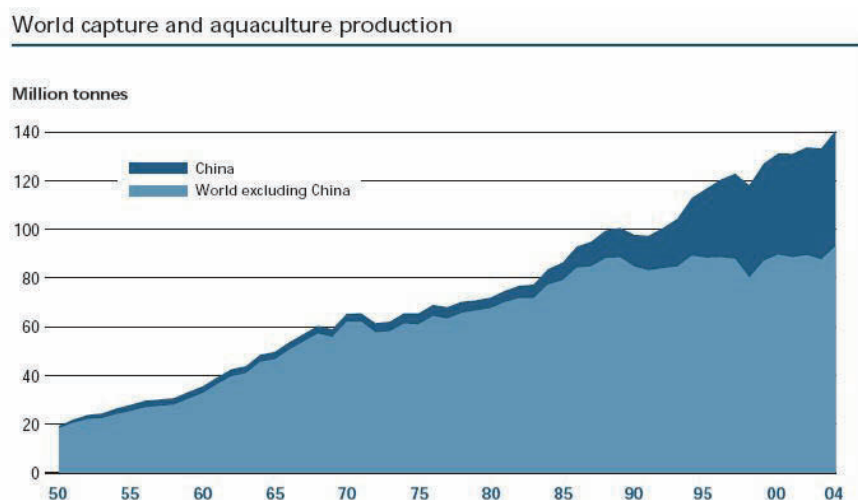
5.2 High Seas Fisheries Crisis: Depletion

Mankind is facing with three interrelated problems: those of a rising population, the provision of adequate food and the increasing production of carbon dioxide emitted into the atmosphere. The United Nations (United Nations 1992) predicts that by 2100 the world population will have more than doubled its 1990 level of 5.2 billion to about 11.5 billion. Providing enough food for this population is an urgent task already for today's world population. It is apparent that the ocean will continue to play an important role in the provision of animal protein in the future (Jones and Young 1996: 99).

Statistics from FAO show that global production from fisheries and aquaculture supplied about 101 million tons of food-fish in 2004, providing a live weight equivalent per capita supply of 16.6 kg, which is the highest on record. Aquaculture accounted for 43 percent of the total amount. Outside China, per capita supply has shown a modest growth rate of about 0.4 percent per year since 1992, as the growth in aquaculture supply more than offset the effects of static fishing production and a rising population. In 2004, per capita food fish supply was estimated at 13.5 kg if data for China are excluded. Overall, fish provided more than 2.6 billion people with at least 20 percent of their average animal protein intake. The share of fish proteins in total world animal protein supplies grew from 14.9 percent in 1992 to a peak of 16.0 percent in 1996, declining again to about 15.5 percent in 2003. Notwithstanding the relatively low fish consumption by weight in low-income food-deficit countries of 14.1 kg per capita in 2003, the contribution of fish to total animal protein intake was significant – at about 20 percent – and is probably higher than indicated by official statistics in view of the unrecorded contribution of subsistence fisheries. Preliminary estimates for 2005 based on reporting by some major fishing countries indicate that total world fishery production reached almost 142 million tons, representing an increase of over one million tons compared with 2004 and a record high production. Although the total amount of fish available for human consumption has increased, the global per capita supply remained about the same as in 2004 because of population growth (Figure 5.1; FAO Fisheries Department 2007: 3-4)

Figure 5.1 demonstrates that the production of both capture and aquaculture fisheries increased six times for the past five decades. Harvest from the ocean had doubled in the last 20 years of the 20th century suggesting that the fishery resources are under increased pressure, while it remains to be seen what influence it has on the environment?

Figure 5.1 World capture and aquaculture production



Atlantic bluefin tuna (*Thunnus thynnus*) for instance spend most of their lives in the cool waters of temperate zones. They are pelagic during all stages of their lives, and are extremely fecund, releasing millions of eggs each time a female spawns. However, “only a fraction of the eggs spawned and fertilized survive to become adults...” Notwithstanding the low survival rates of juveniles, commercial demand for bluefin has increased steadily since the 1960s. Consequently, Atlantic bluefin tuna have declined nearly 90 percent since 1970.¹ Other species are confronting similar situation: haddock stocks have declined 94 percent since 1960, Atlantic swordfish by over 50 percent, and Pacific red snapper by over 90 percent (Tyler 2006-2007: 47-48).

Overfishing of these species wears down food chains, leaving the ecosystem with “junk” species and a drop in biodiversity and biointegrity.² Depletion of fish stocks or removal of other food chains components can cause dramatic changes in the whole marine ecosystems (Broadus and Vartanov 1994: 58).

It is widely noted that the overfishing is originated from excessive fishing capacity. This could be found in the FAO International Plan of Action for the Management of Fishing Capacity 1999 (IPOA-Capacity). According to paragraph 1 of the IPOA-Capacity, “the issues of excess fishing capacity in world fisheries is an increasing concern. Excessive fishing capacity is a problem that, among others, contributes substantially to overfishing, the degradation of marine fisheries resources, the decline of food production potential, and significant economic waste.”

5.3 Solution: Global Governance

It is not the purpose of this paper to define the term “global governance” as there are a variety of definitions on this subject. Instead, the author would like to use the concept of co-operation to describe the on-going processes of managing and conserving fishery resources. Such processes include: international instruments, international organizations, and coordinated measures taken by states.

International Instruments

The 1982 United Nations Convention on the Law of the Sea³ (UNCLOS) and the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks⁴ (UNFSA) regulate co-operation among states on high seas fisheries.

The General Assembly of the United Nations in 1970,⁵ adopted a declaration that states that “States have the duty to co-operate with one another, irrespective of the differences in their political, economic and social systems, in the various spheres of international relations...”. UNCLOS and the UNFSA include articles that embrace the spirit of co-operation. According to Article 118 of the UNCLOS, for instance, states fishing on the same living marine resources or in the same area of the high seas shall cooperate in the conservation of these resources. With respect to straddling fish stocks and highly migratory species on the high seas, relevant coastal states and states fishing for these stocks in adjacent areas of the high seas are also expected to co-operate for the conservation of these stocks.⁶

Part three of the UNFSA includes several provisions for mechanisms of co-operation on the conservation of strad-

1. Jon Van Steenis, “Pirates as Poachers: International Fisheries Law and the Bluefin Tuna”, *Cap. University Law Review*, 29 (2001-2002), p. 661. Another research shows that “compared to its abundance before longlines were introduced (i.e., 1960), the population is now just 3% of its former level - a 97% decline. And, ominously, it is still slowly declining toward extinction.” See <http://www.bigmarinefish.com/bluefin.html>. Visited on 16 October 2007.
2. Biodiversity relates to the amount of different species within an area. Biointegrity reflects the strength of an ecosystem in terms of capacity to resist disease, species extinction, and other ecological infirmities. Peter Jacques and Zachary A. Smith, *Ocean Politics and Policy: A Reference Handbook* (Oxford: ABC-CLIO, 2003), p. 26.
3. The UNCLOS entered into force on 16 November 1994 and there are 155 states ratified this Convention. See “Status of the United Nations Convention on the Law of the Sea, of the Agreement relating to the implementation of Part XI of the Convention and of the Agreement for the implementation of the provisions of the Convention relating to the conservation and management of straddling fish stocks and highly migratory fish stocks”, http://www.un.org/Depts/los/reference_files/status2007.pdf. Visited on 28 October 2007.
4. The UNFAS entered into force on 11 December 2001 and there are 67 states ratified this Agreement. *Ibid*.
5. 1970 Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States in accordance with the Charter of the United Nations, GA Res. 2625(XXV), 24 October 1970.
6. UNCLOS, Articles 63(2) and 64(1).

dling fish stocks and highly migratory species. Although the introductory paragraph of Article 8 seems to leave states a choice whether to co-operate directly or through regional or sub-regional fisheries management organizations or arrangements, the ensuing paragraphs put radical limitations on this freedom. Where there exists fisheries management organization or arrangements to regulate the fishery for a specific straddling fish stock or highly migratory fish stocks, those states fishing for the stocks on the high seas and the relevant coastal states shall become members of the organization or participants of the arrangement.⁷

States fishing for the stock on the high seas may choose not to participate in these initiatives but are then obliged to apply management measures adopted by the organizations or arrangements to be entitled to fish on the stock.⁸ If the straddling fish stock or highly migratory fish stocks is not subjected to the regulatory competence of any organization or arrangement, states fishing for the stock on the high seas and the relevant coastal states are obliged to establish either an organization or other appropriate arrangements.⁹

Regional Fisheries Management Organizations

In the absence of a centralized global authority, regional co-operation is the only option to secure sustainable conservation and management of transboundary marine resources. Regional fisheries co-operation involves efforts by states to overcome collective action problems related to the use of shared and common fisheries. This co-operation arises when two or more states concerned identify a shared problem or goal which requires a common and co-operative solution. Such co-operation is often formalized through bilateral or multilateral agreements establishing principles, rules, procedures and institutional organizations for the implementation of co-operation between the parties. In many cases these agreements are institutionalized by the formation of Regional Fishery Management Organizations (RFMOs; Sydnés 2001: 350-351; Sydnés 2005: 117-133).

Most of the RFMOs with developing country participation, operative during the 1950s and 1960s were initiated by the FAO. They were had mandates to promote research, development and management but no regulatory powers. The organizations were established as development mechanisms and their operation depended on funding from FAO and other donors. To enforce regulations these RFMOs relied heavily on the political will of their constituting members (Sydnés 2002: 374).

Table 5.1 List of selected RFMOs.

APFIC	Asia-Pacific Fisheries Commission
ATLAFCO	African Atlantic Fisheries Conference
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CECAF	Committee for the Eastern Central Atlantic Fisheries
COREP	Regional Fisheries Committee for the Gulf of Guinea
CPPS	Permanent Commission for the South Pacific
CRFM	Caribbean Regional Fisheries Mechanism
FFA	South Pacific Forum Fisheries Agency
GFCM	General Fisheries Commission for the Mediterranean
IATTC	Inter-American Tropical Tuna Commission
IBSFC	International Baltic Sea Fishery Commission
ICCAT	International Commission for the Conservation of Atlantic Tunas
IOTC	Indian Ocean Tuna Commission
IPHC	International Pacific Halibut Commission
NAFO	Northwest Atlantic Fisheries Organization
NASCO	North Atlantic Salmon Conservation Organization
NEAFC	North East Atlantic Fisheries Commission
NPAFC	North Pacific Anadromous Fish Commission
PSC	Pacific Salmon Commission
RECOFI	Regional Commission for Fisheries
SEAFO	South East Atlantic Fisheries Organization
SRCF	Sub-Regional Commission on Fisheries
SWIOFC	South West Indian Ocean Fisheries Commission
WCPFC	Western and Central Pacific Fisheries Commission
WECAFC	Western Central Atlantic Fisheries Commission
WIOTO	Western Indian Ocean Tuna Organization

Source Internet Guide to International Fisheries Law, <http://www.intfish.net>

7. UNFSA, Article 8(3).

8. UNFSA, Article 8(4).

9. UNFSA, Article 8(5).

Some scholars observe that co-operative marine resources management requires three major conditions: the generation of adequate and reasonably consensual scientific knowledge to permit informed judgments about whether and how exploitation of resources shall be conducted; adoption of legitimate and appropriate regulatory measures to govern economic activities while taking heed of existing knowledge; and a system to promote compliance with such measures among those engaged in resource use in the area (Stokke 1999: 159, 162-170). The latter two conditions heavily rely upon members' positive practices.

Some of the RFMOs had taken steps to improve their performance in managing and conserving marine living resources. The paper examines the Inter-American Tropical Tuna Commission (IATTC) as an example to demonstrate progress that RFMOs have made. IATTC was established in 1950, responding to the 1949 Convention for the Establishment of an Inter-American Tropical Tuna Commission.¹⁰ After almost fifty years of functioning, it was decided that the IATTC and its 1949 Convention should be strengthened and modernized to take into account recently adopted international instruments, such as the 1982 UNCLOS, the 1992 Agenda 21 and Rio Declaration, the 1993 FAO Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, the 1995 FAO Code of Conduct for Responsible Fisheries, and the 1995 UNFSA.¹¹ An ad hoc Working Group was formed to review the 1949 Convention.¹²

Table 5.2 Tasks of the Committee for the Review of the Implementation of Measures
Adopted by the Commission, established under the Antigua Convention¹³

<p>Review and monitor compliance with conservation and management measures adopted by the Commission, as well as other cooperative measures; Analyze information necessary to carry out its functions; Provide the Commission with information, technical advice and recommendations relating to the implementation of, and compliance with, conservation and management measures; Recommend to the Commission means of promoting compatibility; Recommend to the Commission means to promote the effective implementation of the Antigua Convention; In consultation with the Scientific Advisory Committee, recommend to the Commission the priorities and objectives of the program for data collection and monitoring of this Convention and assess and evaluate the results of that program; Perform other functions.</p>
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In June 2003 an amended Antigua Convention was adopted.¹⁴ According to Article 10 of the Antigua Convention, a Committee for the Review of the Implementation of Measures Adopted by the Commission is established to undertake activities listed in table 5.2.

Article 18 of the convention provides that Parties shall take the measures necessary to ensure the implementation of and compliance with the Antigua Convention and any conservation and management measures adopted pursuant thereto, including the adoption of the necessary laws and regulations. Also, Parties shall provide the Commission with all the information that may be required for the fulfillment of the objective of the Antigua Convention, including statistical and biological information and information concerning fishing activities in the Convention Area. Parties shall also provide the Commission with information regarding actions taken to implement the measures adopted in accordance with the Antigua Convention.

Like IATTC, other RFMOs takes similar actions so that the conservation and effective management can be

10. For 1949 Convention, see http://www.iattc.org/PDFFiles/IATTC_convention_1949.pdf.

11. IATTC, Resolution on the Establishment of a Working Group to Review the IATTC Convention, June 1998.

12. Ibid.

13. Annex 3. Committee for the Review of Implementation of Measures Adopted by the Commission, Antigua Convention.

14. Convention for the Strengthening of the Inter-American Tropical Tuna Commission Established by the 1949 Convention between the United States of America and the Republic of Costa Rica (also known as "Antigua Convention"). For full text, see http://www.iattc.org/PDFFiles2/Antigua_Convention_Jun_2003.pdf.

achieved.¹⁵ It might be safe to conclude that RFMOs and the arrangements they engage in result in regulating the high seas fisheries of straddling fish stocks and highly migratory fish stocks (Henriksen, Honneland and Sydnes 2006: 16; Churchill and Lowe 1999: 309; Vicuna 2001: 40-42).

5.4 Conclusion: A Policy Transformation

Fishing or fishery is a vital aspect of the world's diet, economy, and biodiversity. However, overwhelming evidence shows that fish stocks are in danger and this constitutes not only a crisis for food, but also for the environment. The history of high-seas fisheries management over the last 150 years can be divided into three phases. The first phase until the early 1970s saw a rapid increase in the number of fishing vessels operating in single oceans and advances in technology to allow greater catches. During this phase, states had narrow coastal maritime zones and a large proportion of fisheries in the high seas fell under the jurisdiction of international or regional fishery commissions. The second phase between the mid-1970s and early 1990s saw the negotiations for the Third United Nations Conference on the Law of the Sea. During this period, coastal states extended their jurisdiction over seas to 200 nautical miles and many areas that were previously classified as high seas came under national jurisdiction. The area defined as high seas was thus reduced and consequently so was the area under the jurisdiction of regional and international fisheries commissions. Since the mid-1990s, high-seas fisheries management has entered its third phase. The phase reflects the international community's concerns about overfishing of the high seas. During the third phase, greater emphasis has been placed on the responsibilities of all nations to conserve ocean resources and on co-operation between states adjacent to the fisheries and those exploiting them (Sen 1997: 85-86).

To conserve and manage marine living resources, traditional ideas of *utilization* should be transformed to *sustainability*. Sustainable development is the development that "meets the needs of the present generation without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development 1987: 43) Governments should follow this principle when devising fishery policies and not concentrate only on increasing fishing capacity, especially considering FAO's warning of the critical condition of fishing stocks in its 1999 International Plan of Action for the Management of Fishing Capacity (Rayfuse 2004: 469-477). In addition, a "precautionary approach" should be followed. The concept of precautionary approach was developed during the mid-1980s, included in regional legal instruments for the protection of the terrestrial and marine environments, and finally included in Principle 15 of the 1992 Rio Declaration.¹⁶ It states that:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

The UNFSA specifically includes this approach as can be seen from its Article 6:

1. States shall apply the precautionary approach widely to conservation, management and exploitation of straddling fish stocks and highly migratory fish stocks in order to protect the living marine resources and preserve the marine environment.
2. States shall be more cautious when information is uncertain, unreliable or inadequate. The absence of adequate scientific information shall not be used as a reason for postponing or failing to take conservation and management measures.
3. In implementing the precautionary approach, States shall improve decision-making for fishery resource conservation and management by obtaining and sharing the best scientific information available and implementing improved techniques for dealing with risk and uncertainty.

Such consideration even have to be taken when a natural phenomenon has a significant adverse impact on the status

15. For example, on 27 December 2000, the International Commission for the Conservation of Atlantic Tunas (ICCAT) adopted a resolution under the title of "Supplemental Resolution by ICCAT to Enhance the Effectiveness of the ICCAT Measures to Eliminate Illegal, Unregulated and Unreported Fishing Activities by Large-Scale Tuna Longline Vessels in the Convention Area and Other Areas". Under this resolution, the ICCAT Commission urged Japan and Taiwan to take the necessary measures to complete the scrapping of IUU vessels built in Japan and Taiwan.

16. Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, A/CONF.151/26 (Vol. I), 12 August 1996.

of straddling fishing stocks or highly migratory fish stocks, States shall adopt conservation and management measures on an emergency basis to ensure that fishing activity does not exacerbate such adverse impact. States shall also adopt such measures on an emergency basis where fishing activity presents a serious threat to the sustainability of such stocks.¹⁷

Assessment of past policies is one of the most important tasks of policy-making studies. During a period when economic growth and international trade play a dominant role, exploring marine living resources and increasing production might be the right choice. However, in a globalized world it is hard to ignore the intricate links between trade and the environment. The same accounts for fisheries. Since we are in the phase of conserving and managing fishery resources, and international instruments and RFMOs have already adopted the concepts of sustainability and precaution into marine fishery, it is, therefore, the right time and right choice to adopt environmental deliberations as a key base for formulation of fishery policies.

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Branding Strategy: Self-Regulation of Sea Cucumber Fisheries in Rishiri Island

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Abstract: Global market of dried sea cucumber expanded in the late 1990s and this creates serious problems worldwide. One of the notorious examples comes from Galapagos Islands in Ecuador. Thus, the Ecuador Government proposed sea cucumber listed in the CITES in 2002, which triggered the international debates how to conserve sea cucumber involving all kinds of stakeholders: fishermen, traders, researchers, conservationists, NGOs and fisheries agencies. The chapter first explores the contemporary international debates how to conserve sea cucumber with relation to conservation of sea cucumber culture in Asia. Among the 30 to 40 commercially traded sea cucumbers, northern China traditionally prefers only a few spiky sea cucumbers (*tsu-shen*) that are mainly harvested in temperate waters. Among the temperate spiky species, the Japanese common species, *Stichopus japonicus* is highly appreciated. Furthermore, the dried products from northern Japan price the most expensive in the world market because of its sharpest spikes. The price of *Stichopus japonicus* in Hokkaido has been rising since 2000. The second part of the chapter introduces the case studies based on my fieldwork in Rishiri Island, northernmost of Japan: how fishermen began sea cucumber fishing, how they develop their qualitative brand, how they manage their resources etc. Competing with strong market pressure and poaching, fishermen in Rishiri Island have developed communal rules that has been the results of exchange of ideas and practices with outside societies. They have established the “Rishiri brand” after long trial and error periods.

6.1 Introduction

Globalization can be defined as the coming and going of things, capital, people, and information around the world at speeds that were unthinkable before. It also means that local systems and ways of doing are gradually being weeded out as we adopt global standards in many areas. As an example, we can look at the effect global environmentalism has had on various regions of the worlds since the concept became popular in the 1970s with slogans such as “Only One Earth” and “Earth the Spaceship.” After the 1972 UN Conference on the Human Environment in Stockholm, international environmental NGOs began to assert a need to protect endangered wildlife and ecologies around the globe. These movements have crossed national borders and have forced people around the world, including whalers in Japan, to change or even abandon the way they use natural resources if it does not fit the global standard.

With so many environmental issues surfacing every day, environmentalists have every reason to be concerned about the future of the Earth. At the 1992 UN Conference on Environment and Development (the Rio Summit), wildlife protection was a top concern and a convention on biodiversity was passed. But paradoxically, the preservation of biodiversity also requires the preservation of the diversity of the cultures that exist in those ecologies (Nettle and Romaine 2000, Dove, Sajise, and Doolittle 2005). Against this tide of global wildlife protectionism, I have focused on the history and current state of production and consumption of sea cucumbers to illustrate the shortcomings of the CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) and the environmental movement, and argue that management of natural resources is best carried out by “local” people (Akamine 2005, 2006, 2007).

In this paper, I would like to consider further the significance of promoting resource management at the regional level by presenting a case study of dried sea cucumber production in Hokkaido, where the highest grade of dried sea cucumber fetches over 100,000 yen per kilogram, and examining how the local people have managed their resources to maintain their fishing industry.

6.2 The History of Sea Cucumber Foodways

Presently, the use of sea cucumbers in cooking is without question limited to the Chinese food diaspora. This includes China, Hong Kong, Taiwan, and Singapore, as well Korea, Japan, and Chinese populations in the U.S., Canada, and

Australia on the periphery. Although Chinese cooking boasts a 4000 year history, the use of dried sea cucumber in China began to spread only during the late Ming and early Qing dynasties between the end of the 16th century and the beginning of the 17th century. In Chinese literature, the first reference to the medicinal qualities of dried sea cucumber was recorded in 1602 in *Wuzazu* (Dai 2002: 21-23), which stated that “sea cucumbers (*hai shen* in Chinese, literally means sea-*ginseng*) can be found in the coastal area of Liaodong...they rival *ginseng* in warming the body and replenishing the blood, hence their name (Xie 1998: 90).” Later, during the 18th and 19th centuries, sea cucumber dishes gained explosive popularity in the imperial court.

Although Japan was officially “closed” to the outside world during this time, it was actually importing Chinese silk goods and raw silk thread through Nagasaki and exporting silver and copper in return. Towards the end of the 17th century, however, silver and copper production began to fall. In response, the Tokugawa Shogunate ordered increased production of dried sea cucumbers, abalone, and shark fin to replace silver and copper as the major export products in trade with China. The people mobilized to produce these products were not only Japanese fishermen, but also the Ainu living in the Ezo region north of the Japanese border (mostly present-day Hokkaido). That is, these fishermen and Ainu people were set to work producing dried sea cucumbers to trade for silk that they themselves would never wear but would be worn by the samurai and aristocrat classes (Tsurumi 1999).

Under their trading monopoly, the Edo Shogunate concentrated all dried sea cucumber exports in Nagasaki and divided them into ten different grades according to size and quality. Table 6.1 lists these different categories, but what is most interesting is that sea cucumbers from Ezo were all almost unconditionally classified as top-grade.

Table 6.1 Classification of Japanese dried sea cucumber in Edo period

Classification	Length (cm)	Number of pieces per 600 g	Grams per piece
10	13.5	10	60
9	12	12~13	46~50
8	10.5	20	30
7	9	30	20
5	7.5	40	15
4	6	55	11
3	4.5	80	7.5
2	over 3	120~130	4.6~5
1	3	150~160	3.8~4
	below 3	200~300	2~3

Adapted from Fisheries Division (1935: 50).

According to “*An Illustrated Guide to Exporting Straw-bag Goods to China (Karakatawatashi Tawaramono Shoshiki Tairyaku Ezu)*,” compiled by the Matsumae clan during the late Edo period, a top grade of 10 could be assigned to a sea cucumber, regardless of size, if (1) it had sharp parapodia and came from Hokkaido or (2) it came from Aomori, Iwate, or Miyagi and was of good quality and had as sharp parapodia as Hokkaido specimens (Tajima 1994: 302). In other words, sea cucumbers from Hokkaido set the standard for the top grade rating and exceptions were made for mainland sea cucumbers only if they were similar to those from Hokkaido.

In a price spread that continues to this day, dried spiky sea cucumbers from Hokkaido commanded twice as much as non-spiky sea cucumbers from the inland seas or the mainland¹. There is no scientific explanation as to why spiky sea cucumbers were preferred, but I imagine that it appealed to the aesthetic sense of the Chinese that when the Hokkaido sea cucumbers were processed and dried, the parapodia stood out in miniature even more than when the sea cucumber was fresh, and remained so even when the sea cucumber was restored to size with water and cooked.

1. Average retail prices of dried sea cucumber are available at the inter-net online shop opened by one of the major dried marine products retail shop in Hong Kong, On Kee Dry Seafood’s website: <http://www.onkee.com/b5/index.htm>.

6.3 Cishen and Guangshen

Just as described in the section on sea cucumbers in *Bencao Gangmu Shiyi* (Zhao 1971: 494), compiled in 1765, the Chinese call sea cucumbers with spikes “ci-shen” (spiky sea cucumber) and those without “guang-shen” (shiny sea cucumber). “Spikes” actually refer to the parapodia lining a cucumber’s back and sides that harden when dried; they are especially prominent in the Hokkaido sea cucumbers described in the previous section. Cishen are most common among temperate sea cucumbers while guangshen are more typical among tropical sea cucumbers. The most common cishen is *Stichopus japonicus*, found in the Bohai Sea and along the Korean, Japanese, and Russian maritime coasts. Some types of tropical sea cucumber found in the Pacific Ocean and around South East Asia, such as *Thelenotia ananas* and *Stichopus chloronotus*, are also classified as cishen.

Chinese cooking is largely divided into Beijing, Shanghai, Sichuan, and Canton cuisine. The regional differences are most pronounced between Beijing and Canton. Traditionally, the Beijing style uses dried Japanese sea cucumbers while the Cantonese prefer tropical *Holothuria fuscogilva* or *H. scabra*. Of course, geographical location plays a part in these preferences for the temperate *S. japonicus* in the north and the tropical *H. fuscogilva* and *H. scabra* in the south. Although I won’t go into detail here, there are also distinct differences in cooking methods and seasoning. The major difference relating to sea cucumber cuisine is that the Pekinese prefer to serve food in small dishes while the Cantonese use a large serving dish placed in the center of a round table. It makes sense that these differences in serving style are behind the higher demand for small sea cucumbers in Pekinese cooking and large sea cucumbers in Cantonese cooking.

Like fashion, however, different foods go in and out of style. Cantonese sea cucumber dishes are now being served Beijing-style in small dishes. Rather than cutting up the larger *H. fuscogilva* into small servings, Cantonese chefs are using the smaller *S. japonicus*. This new movement in Canton style is known as *nouvelle chinoise*. As many Cantonese have immigrated to Southeast Asian countries, and Macau and Guangzhou have been relatively open to outside cultures, Cantonese cooking has been unrestricted by “traditional” styles and is more willing to actively incorporate ideas from other regions.

6.4 Sea Cucumber Fisheries and the Fisheries Law

According to the current Fisheries Law, originally enacted in 1949, sea cucumbers fall under either general fishery rights or licensed fishing. In addition, regional regulations control fishing seasons and equipment according to local conditions. Fishermen operate according to the fishing rules established by the fisheries cooperative association to which they belong. That is, they participate in a self-regulatory system.

The Fisheries Law places sea cucumbers under Type 1 common fishery rights, which means that only fishermen can harvest them. If dredge nets are used, a license is required from the prefectural governor for use of fishing boats weighing 15 tons minimum. The original purpose of the Fisheries Law was to modernize and democratize the fishing industry along the lines of the agricultural land reforms that took place after the World War II. Other than whaling, which requires licensure by the Ministry of Agriculture, Forestry and Fisheries, authority has been decentralized so that the national Fisheries Agency cannot oversee local operations. Consequently, it is difficult for the national government to intercede in poaching of sea cucumbers or resource management. Although the various regional fishing regulatory committees stipulate how and when to fish, actual practice is dependent on the self-regulation of local fisheries cooperatives (Akamine 2004).

Table 6.2 shows information I received during a March 2005 interview I conducted with Charlie Lim, the general secretary of the Sharkfin and Marine Products Association (SMPA) in Hong Kong that is composed of wholesalers of dried sea cucumbers. Lim explained that in Hong Kong, dried cucumbers from Japan are usually divided by size into fifteen different categories. Until around the year 2000, a regular size was an 8 or above in the table. Recently, however, sizes 7 to 11 are selling well while larger dried sea cucumbers do poorly. Lim explained that this is because *nouvelle chinoise* cuisine has taken root in Hong Kong. Instead of cutting up large, meaty sea cucumbers and presenting it in a big serving plate, single sea cucumbers are served in small plates. If a large sea cucumber is used for each plate, the cost per plate is obviously higher. But if smaller sizes are used, for example 400 pieces of dried sea cucumbers per 600 grams batch, the cost per sea cucumber would be just 140 yen even if the batch as a whole costs 60,000 yen.

Table 6.2 Classification of Japanese dried sea cucumber in Hong Kong

Classification	Number of pieces per 600g	Weight per piece (g)
1	20-30	20-30
2	30-40	15-20
3	40-50	12-15
4	50-60	10-12
5	60-70	8.6-10
6	70-80	7.5-8.6
7	80-100	6.0-7.5
8	100-120	5.0-6.0
9	120-150	4.0-5.0
10	150-180	2.7-3.3
11	180-220	2.4-2.7
12	220-250	2.0-2.4
13	250-300	1.7-2.0
14	300-350	1.5-1.7
15	350-400	

Source Interview Charlie Lim of SMPA, March 2005

Separate from this demand for smaller sea cucumbers in Hong Kong, however, Lim noted that the proportion of smaller sea cucumbers being exported from Japan have become large. Lim believed that the ultra small sea cucumbers were being fished in novice regions that had just entered into the dried sea cucumber business: “There’s a difference in the precision of resource management between places where sea cucumbers have been harvested for a long time and places that have only recently joined the market. We’re concerned about regulation in these newcomer areas.” He was apprehensive about the current state of sea cucumber harvesting in Japan, and remarked that “the Japanese government should take action and manage the resources. They did it with abalone, so there’s no reason they can’t do it with sea cucumbers.” It is impossible under the current system, however, for the Fisheries Agency to directly oversee activities in regional waters. Still, as Lim also acknowledged, Japan has a long history of local resource management to draw upon from around the country.

6.5 The Ebb and Flow of Sea Cucumber Fishing in Rishiri Island

Although Rishiri Island has been known for sea cucumber fishing since the latter half of the Edo period, the industry was revitalized only in the mid-1980s with the introduction of dredge net fishing (Akamine 2004, 2007). Of the four fisheries cooperative associations in Rishiri Island, Oshidomari, Oniwaki, Semposhi, and Kutsugata, the Oniwaki fisheries cooperative in the southeast harvests the least amount of sea cucumbers. What was most surprising as I began my research in Rishiri Island in 2003 was that the region was relatively new at sea cucumber fishing and really only had about twenty years of practical experience. I had always assumed that Rishiri Island, famous for producing gourmet sea cucumbers, had been fishing non-stop since the Edo era and communities in Rishiri had extensive experience in sea cucumber resource management.

As part of my research in Southeast Asia, the South Pacific, and other places as well, I have conducted interviews in finding out how sea cucumber fishing developed and technology progressed in each area. In the case of northern Hokkaido, many things remain unclear to me even though I had only a twenty year-old history to explore. Here, as much as my interviewing skills have allowed, I would like to reconstruct the picture I found by presenting two examples of the Oshidomari and Semposhi fisheries cooperative associations.

The Case of the Oshidomari Fisheries Cooperative Association (OFCA)

Satoshi Yoshida first got involved in sea cucumber harvesting in 1984 and began fishing in earnest with dredge nets the following year in Oshidomari, Rishirifuji Town. He began selling fresh sea cucumbers in 2003, but until then had dried all his harvested sea cucumbers at home. Of the 11 members dredge net fishing in the Oshidomari Fisheries Cooperative Association (OFCA), Satoshi has been the only one to do so consistently over the years. As chair of the sea cucumber section of the OFCA until 2005, he is the leading expert on sea cucumber fishing in Oshidomari area. Born in Sakhalin, he was two years old when World War II ended. Both his father and mother were from Rishiri Island, they came back to Rishiri after the war. Although the details were unclear, Satoshi's father worked in something related to the fisheries association and then later took to making salt from seawater and smoking sand lance (*Ammodytes* spp.).

When Satoshi was in his 30s, the fishing industry in Rishiri Island was booming, especially for tuna but also for sand lance, squid, and octopus fishing. Both pole and long line fishing were used for tuna, and Satoshi has kept the back fin of a 267 kilogram blue fin he once caught using only a rod and line. Reflecting the boom, Rishiri Island was featured in a 1981 NHK program called *Shin Nihon Kikou*, or "The New Japan Travels," when it was not uncommon for a fisherman to make one million yen in a single day. Of course, there was no reason to labor over sea cucumbers at the time. The sand lance frenzy was thanks in part to the 200 nautical mile exclusive economic zones implemented by the U.S. and U.S.S.R. in 1977. Prices increased as buyers speculated on a scarcity of sand lances as a result of the zoning. Suddenly though, perhaps because of changes in the ocean currents, both tuna and sand lances stopped coming north.

With both tuna and sand lances vanished, Satoshi had to turn to octopus and sea cucumbers instead. He explained, "I was always thinking about what was likely to make money." He knew that sea cucumbers used to be harvested in Rishiri Island by small surfboat, and when he heard that dried sea cucumbers were fetching a good price, he "figured there would be resources since the area hadn't been fished in years." He learned how to process sea cucumbers from a friend "Y" who then lived in Wakkanai, originally from Satoshi's place on Rishiri. With this shared homeland, Y taught Satoshi everything he knew. According to Satoshi, his was the only boat out of the eleven operating in OFCA in 2006 that had been fishing sea cucumbers for any extended period of time. Five or six boats had started in the spring of 2004, and by the summer the number had increased to ten. Octopus fishing had been sluggish in the summer of 2003, and interests shifted to sea cucumbers in the spring of 2004 around the same time that demand abroad was driving prices up.

Satoshi explained to me, "There are eleven boats operating now in OFCA because we don't make dried sea cucumbers and we sell them fresh instead. If we had to dry them, the boats would be cut in half. Anyone can make dried kelp, but sea cucumbers aren't that easy. It's smoky and it's hot." Unlike machine drying used today, sea cucumbers used to be dried naturally in the sun. As Satoshi's wife, Shizuko, recalled in our interview, "Sea cucumbers are just too hard on the body. Of all the different work I've done, sea cucumbers were the hardest." "You have to stay outside all day for sea cucumbers while kelp is done in one or two hours," and "once kelp is dry all you have to do is put it in storage, but with sea cucumbers, you have to dry it all day, put it away if starts to rain, and even if the weather cooperates, it still takes 20 days to dry."

Furthermore, Shizuko spoke about the hardship of collecting seawater and cutting sagebrush for processing the sea cucumbers. "Even though it costs money, we get freshwater if we just turn the tap. Seawater is free, but we have to get it ourselves, and that's not easy and neither is getting sagebrush." Today, sea cucumbers are harvested in the spring and summer before and after the no-fishing season from May 1st to June 15th. Previously, sea cucumbers were only fished in the summer, when there was plenty of sagebrush available to use for smoking them. Although cut sagebrush "can be cut today and used until tomorrow," sagebrush is no good if dry and fishermen essentially have to cut it fresh each time they return from sea. Although sagebrush grows naturally all over Rishiri Island, people have to separate it out from other grasses that grow in the same places. When sea cucumber fishing reopens on June 16th, the sagebrush is still not very tall yet and consequently, more of it needs to be cut. Without the sagebrush, the sea cucumber cannot be dried correctly, and it takes around 40 to 50 kilos of sagebrush to process 100 to 150 kilos of cucumber. Fresh sagebrush is so heavy that if it is strapped to the back of a motorbike, the front end will tip up.

Satoshi's routine was to get sea urchin in the morning, bring it home, and then set out again for sea cucumber dredging. Shizuko would peel the sea urchins, go out to collect sagebrush and seawater, and then keep a fire going until her husband came home. First, they would boil a large pot filled with seawater, scrap iron, and sagebrush. Only

iron pots could be used because stainless pots would not change the color of the sea cucumbers. After thirty minutes, the water would turn dark and the iron scraps and sagebrush were removed. The sea cucumbers were gutted and placed in the pot. After adding the iron scraps again, the sea cucumbers were simmered for about forty minutes and then smoked with sagebrush for approximately two hours.² If it had been a long day and Satoshi and his wife tried to cut down the smoking time to just one and half hours or so, the high-priced warts would come off of the sea cucumbers. If the weather was bad, they had to extend the smoking time up to three hours.

To smoke the sea cucumbers, the sagebrush was placed in two layers, fresh on the bottom and boiled on top. The sea cucumbers would burn if the flame grew too strong, so the fire had to be watched constantly. During a two-hour smoking, the sea cucumbers would also have to be flipped from side to side or stirred in a drain-board five to six times so that the heat and smoke spread evenly. Satoshi and his wife also recalled how the palms of their hands hurt from having to turn the spiky sea cucumbers as they dried in the sun all day. Shizuko described the sea cucumber business as follows: “When it’s calm, the land is tired,” referring to the fact that if the seas were friendly and fishing was good, it meant that she had more work to do processing the sea cucumbers. Aside from sea cucumber fishing itself, it is clear that women played an essential role in the domestic cottage industry of processing sea cucumbers.

Today, however, all four fisheries cooperative in Rishiri Island, including OFCA, sell fresh sea cucumbers only and do not process them at home. The main reason is a shortage of labor, but another factor may be that profits can only be made at the end of the year for dried sea cucumbers. As Satoshi recalled, “Bidding usually happened in November and we didn’t collect any money until around Christmas. Until then, we’d weigh our goods and dream about what we’d get for it compared to prices the year before.” This brief case study of OFCA revealed that sea cucumber fishing was revived by Satoshi when tuna and sand lance could no longer be caught. Although it is not apparent if his actions had any direct influence on other fishermen, sea cucumber fishing also began around the same time in Semposhi and Kutsugata in Rishiri Island.

The Case of the Semposhi Fisheries Cooperative Association (SFCA)

The first reference to sea cucumbers in the Semposhi Fisheries Cooperative Association (SFCA)’s business report was in 1980. The amounts and sale prices of dried sea cucumbers were recorded for four years through 1983 as shown in Table 6.3. In 1984, however, the sales shifted to fresh sea cucumbers. The reason for this switch was because “it took too much effort for too little money.” As one fisherman explained, “we wake up at four and head out at five. We come back between one and two in the afternoon with our catch. If we process it, we’d have no time for sleep.” Although it’s not exactly clear what triggered the start of sea cucumber fishing in 1980, the opportunity was indirectly presented through local government support for the transplant and replenishment of northern hard-spined sea urchin (*Strongylocentrotus nudus*) populations.

2. The “*Karakatawatashi Tawaramono Shoshiki Tairyaku Ezu*” from the Edo instructs how to boil sea cucumbers with sagebrush. The purpose of using sagebrush is likely because of a catalytic effect, but Satoshi noted that it prevented “strange bugs from getting into the product. Even when sun-drying, cats and crows don’t touch it and even silver flies stay away.”

Table 6.3 Sea cucumber production at OFCA

Year	Dried Sea Cucumber			Fresh Sea Cucumber			No of Operators
	Weight (kg)	Amount (yen)	Price per kg	Weight	Amount	Price per kg	
1985	303	2,876,475	9,496	9,085	2,277,358	251	Na
1986	435	3,897,145	8,959	0			7
1987	398	4,920,096	12,371	0			5
1988	662	8,015,812	12,107	0			4
1989	420	5,234,171	12,459	0			4
1990	401	5,646,933	14,068	0			4
1991	437	6,010,326	13,750	0			4
1992	471	6,549,775	13,900	0			Na
1993	431	6,319,227	14,648	0			4
1994	471	6,528,067	13,857	0			4
1995	340	4,280,526	12,593	0			3
1996	0			0			0
1997	0			151	59,305	393	Na
1998	0			520	227,763	438	Na
1999	249	3,770,349	17,649	261	113,000	433	2
2000	88	1,560,188		955	582,833	610	2
2001	0			3,908	1,933,666	495	2
2002	0			1,594	1,367,845	858	Na
2003	0			9,114	10,588,779	1,162	1
2004	0			52,900	81,964,000	1,549	10
2005	0			42,500	68,171,000	1,604	11
2006	0			58,000	141,759,000	2,444	11

Source *OFCA Business Report*; na = no data available

Table 6.4 Sea cucumber production at SFCA

Year	Dried Sea Cucumber			Fresh Sea Cucumber		
	Weight (kg)	Amount (yen)	Price per kg	Weight (kg)	Amount (yen)	Price per kg
1980	29.0	110,015	3,794			
1981	300.0	1,155,936	3,853			
1982	60.0	178,000	2,967			
1983	72.7	474,790	6,531			
1984	0			5,162	2,825,000	547
1985	0			16,000	3,917,000	245
1986	0			10,447	2,001,000	192
1987	0			30,378	8,741,000	288
1988	0			76,676	29,478,000	384
1989	0			58,556	21,567,000	368
1990	0			68,978	29,474,000	427
1991	0			63,719	26,846,000	421
1992	0			36,301	15,783,000	435
1993	0			65,436	28,432,000	435
1994	0			81,560	40,717,000	499
1995	0			75,708	29,759,000	393
1996	0			61,888	21,803,000	352
1997	0			52,397	21,334,000	407
1998	0			62,311	29,911,000	480
1999	0			50,739	27,256,000	537
2000	0			52,999	35,269,000	665
2001	0			50,259	27,179,000	541
2002	0			51,116	37,533,000	734
2003	0			51,052	64,615,000	1,266
2004	0			50,020	81,116,000	1,622
2005	0			51,000	87,002,000	1,706
2006	0			53,959	136,098,000	2,522
2007	0			51,954	156,339,000	3,009

Source SFCA Business Report

In the early 1970s, the Rishiri Municipal Government launched a project transplanting *nona*, or northern hard-spined sea urchin living deep waters to shallower waters. The government provided funding for dredge net boats to catch sea urchin from 20 to 30 feet depths and transfer them to shallow-water coasts. Dredge net made in Suttsu, southwestern coastal Hokkaido, were brought to Rishiri and copied by local ironworkers. However, the dredge net did not retain the sea urchin well, and in fact broke off their spines. With each year, the shells of the sea urchins also got smaller and smaller. What the nets did manage to catch were more sea cucumbers than sea urchins.

While the details of this project need further investigation, but it is certain that it opened the door to dredge net fishing of sea cucumbers in Rishiri Island. The fisheries association's report in 1980 reflected the first time dry sea cucumber production was conducted on a trial basis after the transfer project ended. Veteran fishermen taught sea cu-

cucumber drying methods to others in the association. If it was raining in Semposhi, people drove to where it was sunny to dry their cucumbers. So much sagebrush was used that it ran out in Semposhi district. Despite successful catches though, the fishermen could not make ends meet with dried sea cucumber. They switched to selling raw cucumber in 1984 and continue to do so today.

Dredge net fishing began full throttle in 1984 when sales turned to raw sea cucumber. The town of Rishiri issued financial support and dredge net were made to order by seven or eight fishermen at iron factories in Otaru. Presently, dredge net are made locally in two factories dotting the island. Fishing was not the only industry drawn to sea cucumbers in the mid 1980s.

Gake Seafood Processing, a local processor of marine products such as kelp and octopus, made dried sea cucumber for approximately five years beginning around 1985. After that, they bought fresh and sold sea cucumbers to buyers in Wakkanai. Although Gake had initially begun producing dried sea cucumbers because of orders from a trading company in Kobe, they were forced to stop processing and sell fresh instead because of a shortage of women factory workers. To process one ton of raw material, the Gake plant required 15 workers. But since the limited sea cucumber season coincided with the sea urchin and kelp (especially cultured crops) seasons, most of the female labor force in Rishiri Island was occupied with processing work in the home.

While we cannot generalize from the cases of Oshidomari and Semposhi, it is apparent that sea cucumber fishing was established in Rishiri Island around 1985 as a substitute for the formerly lucrative tuna and sand lance. Dredge net sea cucumber fishing boomed as a by-product of the northern sea urchin transport project, and companies such as Gake Seafood Processing profited from demand for sea cucumber outside the island.

6.6 Natural Resource Management: The Example of Rishiri Island in Hokkaido

Dredge net fishing of sea cucumbers by the SFCA in Rishiri Island, Hokkaido began in 1984, but it was not until 1988 that a sea cucumber section was established within the association. At this time, resource management was actively practiced and catches were limited to sea cucumbers weighing at least 80 grams. In 1989, this weight limit was raised from 80 to 100 grams and cucumbers less than 10 centi-meters in length were to be thrown back to sea. The next year, in 1990, the bar was again raised to 130 grams. In 1999, the association implemented a self-regulatory 50-ton limit to its total catch in the interest of preserving resources. This number was arrived at “roughly” based on market conditions and the calculation that each of the association’s boats would be allowed 0.5 tons.³

Since 1984, the SFCA has engaged in the fresh sea cucumber trade, but with the expectation that the sea cucumbers will be shipped to the mainland to be processed and dried. This is partly because there is almost no demand for fresh sea cucumber in Japan during the summer fishing season in Semposhi. In fact, the size and weight restrictions implemented by the sea cucumber section were influenced by the fact that the sea cucumbers would ultimately be dried. If the sea cucumbers were too small, buyers would bargain for cheaper prices. Although fine as a fresh product, small sea cucumbers were difficult to process and they fetched only low prices at market. These conditions led the SFCA to return not only small sea cucumbers, but also “anything damaged” to the sea. Beginning in 2002, each boat collected these small or damaged sea cucumbers and lined up each day to return them to the summer fishing grounds in the spring and the spring fishing grounds in the summer.

When the sea cucumber section in SFCA first imposed the 80 gram weight limit in 1988, it aimed to conserve resources and also make a greater profit since small sea cucumbers were bargained down at market. As discussed in section 6.4, however, the market price for smaller sea cucumbers has now increased because of recent demand from Hong Kong and China. But the fishermen seem to distrust buyers whom they believe are “suddenly saying they want smaller sizes because the price of sea cucumbers has gone up.”

Since the fishermen started trading fresh sea cucumber, one of the major marine product processing plants in Hokkaido has submitted several complaints. At one point, they required the association to make shipments using barrels that were labelled with the name of the boat that made the catch. Although the association made an effort to retain

3. The SFCA has set its upper limit to 50 tons “until July 20th” and the sea cucumber division has agreed to remove the limit if the sea cucumber population becomes too large do to preservation efforts.

moisture and shipped at a ten percent “premium”⁴, the buyers still complained about poor quality and demanded a higher premium. If the association agreed, they knew that they would eventually face the same demands again. Instead of raising the premium, they negotiated with the buyers to resolve their complaints. For example, both sides have agreed that water should not be put in barrels and that sea cucumbers should be divided up at sea and then checked again on land for size.

One member of the sea cucumber section boasted about nurturing the Semposhi brand, explaining, “It’s not a matter of gains or losses. If you cheat, it comes back to you.” Still, it was disappointing to him that after all of their efforts, there were no major differences in value compared to other regions. The fishermen blame this on buyers who “want nothing more than to get their hands on ‘North Sea cucumbers.’”

Resource management by the sea cucumber section was not limited just to size restrictions. In 2001, six members of the section and the association’s sales representative went to observe the sea cucumber business in Aomori prefecture. Unfortunately, sea cucumber fishing waters in Aomori were too shallow to be compared to Semposhi, where dredge nets were dragged at depths of 60 to 70 meters. Moreover, Aomori was focused on fresh food products but not on dried products, so they kept small, soft sea cucumbers and tossed large ones back to sea. Still, the Semposhi fishermen were impressed that the town of Yokohama had standardized fishing equipment and regularly checked for violations. As a result of their visit to Aomori, the Semposhi sea cucumber section was also inspired to re-examine the spawning period of sea cucumbers. In Hokkaido, sea cucumber fishing is banned in the Soya Sea area from May 1st to June 15th during what is believed to be the spawning period. However, some fishermen raised the possibility that sea cucumbers in the area were actually reproducing in July and August, leading to an investigation in 2001.

These fishermen are currently still appealing to Hokkaido to change the regulations related to fishing season dates. Informational meetings were held in Wakkanai and Oshidomari in 2005, but Hokkaido Government has otherwise been slow to move. Fishermen who attended both meetings said, “the content was the same— they’re using data from Sarufutsu,” and “the Sarufutsu results are exactly the same as the results from Semposhi,” “anyone who fishes sea cucumbers could tell you that.” The SFCA argued that they have been proactive about conserving resources. When they learned that starfish are predators to sea cucumbers, they stopped throwing back the starfish that came up in their dredge nets.

Presently, there are eleven dredge net fishing boats in SFCA. There were ten boats until 2004, and the eleventh boat was added in 2005 when the fisheries cooperative recommended a novice fisherman in his early 50s to the sea cucumber section when the man made an appeal that he needed money to support his three children. Previously, fishing boats had been unrestricted. The number of boats was limited to ten only in 1999 at the same time that the 50-ton limit on a total catch was implemented. Up until that year, there had been twelve boats operating, but one fisherman passed away and another retired. The eleventh boat was admitted in 2005 because the section felt an obligation to support a fellow cooperative member and because the price of sea cucumbers was on the rise.

During my fieldwork, one of the members of the cooperative lost a family member. Since three fishermen in the same area had to attend the funeral and were unable to fish even though conditions were favourable, the entire section took the day off. They explain, “we have this organization to work together,” “the 50-ton limit is there so that everyone uses resources equally, otherwise, everyone would just operate on their own.”

6.7 Conclusions

Together, the two cases studies of OFCA and SFCA illustrate sea cucumber fishing and self-regulation in local communities. Although Rishiri Island is only one of many places in Japan where sea cucumbers can be harvested, it is known for its especially high quality within the high quality market of Hokkaido. While fishing began in the late Edo period, it was not until the mid-1980s that Rishiri Island became such an active center for sea cucumber. Its success can be attributed to the pride of local fishermen who have striven to meet the insistent demands of buyers.

While the debate was divided and should be further investigated, another example of local self-management could

4. A “premium” or “*ire-me*” refers to adding an extra five to ten percent of product when it is weighed-in at market to compensate for the debris and seawater that are contained in sea cucumbers and shellfish. It is a customary practice out of consideration that when a raw product is processed, its actual weight will be less than what was purchased.

be seen in the cooperative attitude between the fisheries cooperative and the sea cucumber section regarding the issue of admitting new fishermen. It is an issue that is specific to sea cucumber dredge net fishing, as spoon-net fishing by small surfboats is open to all (for example, catch landings of sea cucumber by spoon-net in SFCA were 4 metric tons and 2.5 metric tons in 2006 and 2007 respectively). Fishing in Rishiri Island has tended to concentrate heavily on coastal resources such as kelp and sea urchin, both of which have developed strong regional identities that have also been applied to sea cucumbers as coastal marine products.

Self-management by local communities continues by trial and error. Certainly government can do its part to respond quickly to proposals born from experience regarding changes to fishing regulations. The CITES should be called upon only if every effort is made and there is still a fear of exhausting resources. Rather than depending on laws or imposed systems, local fishermen should tap into the power and knowledge that is inherent in their communities.

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Part Two

**Borderlands,
Transborder Resource
Management and
Conservation**

Political Boundaries, Divided Peoples and Transborder Conservation of Central African Forests: Two Congo Basin Cases

Rebecca Hardin, Marine Robillard and Serge Bahuchet

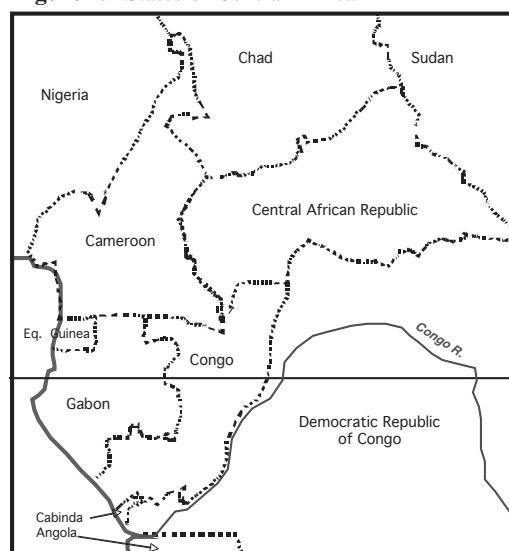
Abstract: Contemporary national borders in the natural resource-rich Congo basin are inherited from the colonial past of Central Africa, which was divided between France, Belgian, Great Britain, and briefly Germany (until WW-I). Through complex processes combining expeditionary science, diplomacy, and dialogue with local and regional indigenous leaders, the western Congo basin went through multiple processes of “delimitation.” These processes defined boundaries of colonial territories, but also of their internal trading concessions and conservation areas. The results divided and newly demarcated populations : the same ethnic groups are located on each side of many borders, including the Pygmy hunter-gatherers. Some group identities were themselves shaped by colonial exploration, exploitation, and delimitation. Some of these reference political and geophysical borders, such as the “Sangha Sangha,” who span ethnolinguistic groups across national boundaries in the Sangha River basin. This paper relates such complexity to efforts at transboundary conservation in the region today, exploring the dynamics of identity, territory, knowledge, and power that in constitute a complex social matrix shaping protected area policy in the region. We take as cases two conservation initiatives, themselves made up of several intersecting projects : the Tri-national Sangha Conservation area, containing three contiguous national parks (Dzanga-Sangha in Central African Republic, Nouabale-Ndoki in Congo and Lobeke in Cameroon) ; and the “Tridom” which is a project of corridors joining three national parks (Odzala in Congo, Dja in Cameroon and Minkebe in Gabon). We draw upon historical evidence from the Centre des Archives d’Outre Mer in Aix en Provence, France (in particular from “Missions et délimitations” dossiers on Moyen Congo and Gabon from the turn of the twentieth century), as well as on our field research as ethnographers in this region. We explore the fragmented and complex African identities across which alliances and competition have shaped resource use within these regions, while also recognizing the roles these regions have as “hinterlands” within the nation states that contain them, and as crucibles for geopolitical struggles among transcontinental economic actors. Situating our work in the context of current studies that chronicle a surge in ethnically-based approaches to claims about rights and partnerships for environmental governance in Africa, we chronicle the stirrings of cross-Congo Basin political identity among hunter-gatherers at present, with specific reference to our study sites. We thus offer insights about the colonial histories and emerging political valences of ecologically inflected identities in the governance of these transborder conservation zones, offering an analytical model that takes into account the cultural and historical components of current shifts in the theory and practice of protected area management.

7.1 Present Borders and Biodiversity Conservation

The natural resource-rich Congo basin is a repository of crucial mineral, wildlife, timber, water, and carbon resources for regional and global markets, as well as being an ecosystem known for its abundant wildlife. For the purposes of this paper, we focus on Cameroon, Equatorial Guinea, Gabon, Congo (Brazza), Central African Republic, bracketing the Democratic Republic of Congo which is in effect spans the economies and ecosystems of eastern and western central Africa. This enables us to focus on the intertwined and highly fluid transborder economies of the western central African countries.

As we shall see these countries are linked through their colonial history of trade and governance. In addition these countries are today associated in a commercial organization, OCEAC, which include trade and customs agreements. We can summarize the situation by saying that two “old” stable countries, Cameroon

Figure 7.1 States of Central Africa



and Gabon, which have been ruled by the same presidents for decades, are surrounded by more instable countries submersed by various levels of civil strife and regime change over the past 15 years, (the two Congos, CAR and Tchad). Central African Republic and Democratic Republic of Congo are still unstable and under unpredictable and conflictual context. This situation has resulting in a hudge regional destabilization with millions of refugees, fleeing from East to West.

Further complicating factors include the formal economic poverty of the region, and what we have called elsewhere economies of pillage, that prevent the exploitation of extant resources from leading to growth, development, and diversification of national economic structures. In other words, despite the increasing export of timber and mining resources, generating important profit, is not coupled with any improvement of wellbeing of the populations, as expressed in the bad indices of HDI. Despite increasing export of rich natural resources, biodiversity-rich Central African countries are among the poorest of the present world. Several of the countries of the Congo Basin are among the bottom list of the countries as far as GDP and HDI values are concerned: all the oil producing countries (Cameroon, Gabon, Equatorial Guinea and Congo) have moderate to low HDI values, HDI for CAR is really low (Table 7.1 ; *cf.* Bahuchet 2000 ; Bahuchet & McKey 2005). Indeed, in the Central African Republic, contrary to much of the word, lifespan has actual decreased, and infant mortality increased in recent years (Wakabi 2006).

Table 7.1 Human development index

Country	Population (Million)	GDP/Hab (USD)	HDI-2005	Rank
Gabon	1,311	6 954	0,677	119
Eq. Guinea	496	7 874	0,642	127
Congo (Br.)	3,689	1 262	0,548	139
Cameroon	18,175	2 299	0,532	144
CAR	4,265	1 224	0,384	171

Source PNUD Human Development Rapport 2007/2008, pp. 229-232

The global increase of population is associated with a very high rural emigration : in sub-Saharan Africa, increase of urban population was 4,7 % per year between 1990 and 1995 (to compare with 1,4 % for the rural population; Trefon 2000 : 310). Such a situation detracts from the efficiency of conservation programs, because states and non governmental actors are constrained to address fundamental economic problems, and to attempt poverty alleviation in contexts of inefficient governance. Indeed, a recent and detailed study on governance and biodiversity by Smith et al. (2003) shows that : “ ... countries rich in species and identified as containing priority areas for conservation have lower governance scores than other nations.” (Smith et al. 2003 : 68).

Despite these challenges, protected areas in these countries have dramatically increased in the last two decades. In fact, there has been a veritable flurry of prospecting and censusing wildlife, proposing of limits, gazetting and managing which have contributed to this overall increase in the surface of protected areas in this part of Africa. This reached its apogee in the Yaounde summit of 1999, and has continued apace since then (James et al. 2001, Wilkie et al. 2001).

Many of these new protected areas, like those of the colonial era —indeed in some cases extending and expanding those of the colonial era— are along borders that these indebted and unstable nation-states find it challenging to manage and defend. As such, the stakes involved in transborder conservation are at once scientific and economic, as well as being strategic, or geopolitical. This is particularly true given that military equipment and training for anti-poaching patrols, from U.S. and other agencies, has been a heavy percentage of overall aid to these countries for their conservation programs. Further, the prolific and vivid documenting by journalists and activists of uncontrolled hunting in and around the forest concessions of the region bolstered efforts to empower anti-poaching forces to suppress the illegal trade in wildlife meat and body parts, known internationally as the bushmeat trade (Wilkie and Carpenter 1999, Robinson and Bennett 2000, Barnes 2002, Milner-Gulland and Bennett 2003).

Such dynamics of suppression reflected the ascendance of animal rights movements as they both challenged and bolstered the growth of international conservation NGOs in the 1990s. Further, there were cases of broader popular drive among consumers and green political movements in western Europe and the U.S. to protect animals and their

habitat from the violence of commercial hunting that characterizes extractive industry in these tropical areas that were once colonial territories of Europe. Such concerns in effect enabled the emergence of the bushmeat issue as a crisis bolstered the extension of protected areas in African wildlife habitat, and gave rise to new models of what Lemos & Agrawal (2006) have called “hybrid environmental governance”. Hybrid governance refers, among other things, to partnerships between international conservation NGOs and transnational corporate actors. In equatorial Africa rather than leading to direct links between NGOs and communities, for instance, partnerships were formed between NGOs and companies for stricter monitoring and enforcement of anti-defaunation policies at the concession level.¹

More recently, in several sites, this suppression of illegal hunting by both national and private anti poaching forces has led to international scrutiny with respect to human rights abuses against particular peoples residing and hunting within these areas. In effect, popular concerns with animal welfare have had to accommodate growing concern from an international public about the protection of forest peoples from abuse at the hands of state or international actors (Salafsky and Wollenberg 2000, Sunderlin et al. 2005, Bennett et al. 2006, Brockington et al. 2006, West and Brockington 2006, Chan et al. 2007). This latter concern is bolstered by emerging policy and political agendas favoring the decentralization of resource management worldwide. And while the timber interests of the western Congo basin have resisted and reacted to such trends, they are themselves in transition. The incursion of Asian capital into the forestry sectors of these African countries has profoundly altered the possibilities for partnerships, policy implementation, and dialogue across the communities of residents, experts, elected officials, and business interests.

There is thus a pressing need to take stock of histories and trends in these regions and sectors. To do so with sustained ethnographic attention to the lived experiences of forest residence, and to the historical transformations in their links to one another and to outsiders is not easy. We write as ethnographers who have conducted long term fieldwork in the region, but also as experts who are increasingly interpellated by the policy and reform processes described in this introduction.

Crucial to our analysis is the fact that contemporary national borders throughout much of Africa have been created through an historical process, which ended with the independence in 1960. We explore the roles of natural science and social identities in the formation of those borders, contextualizing contemporary debates about transborder resource management vis a vis the area’s precolonial subsistence legacies, and colonial practices of territorial delimitation for resource use. Further, we will reflect on what we see as the relationship between these notions of borders or boundaries, and the postcolonial identity politics which, today, entail substantial tensions between the categories of “local” versus “indigenous” identities within national and transnational efforts at environmental governance. Before tracing the key trends in today’s social dynamics of transborder conservation, however, let us offer some elements of deeper historical dynamics.

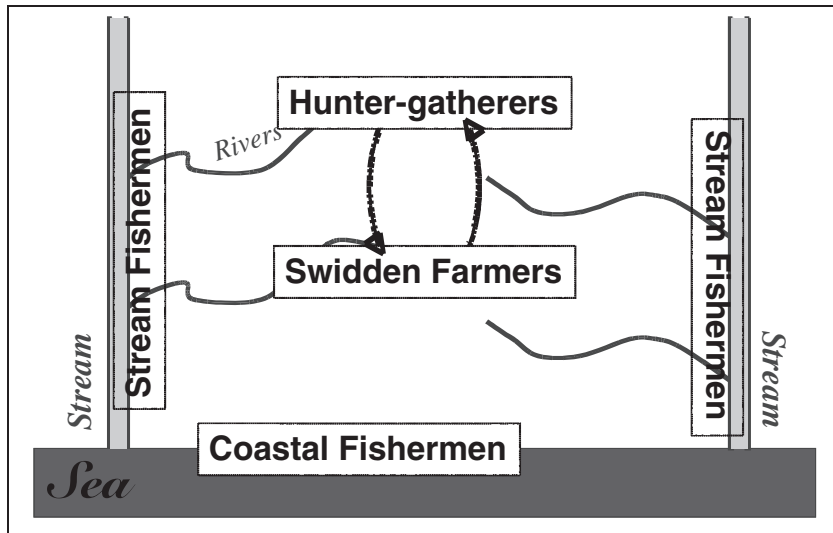
7.2 Precolonial Settings

Precolonial social contexts in the Congo can be summarized as a huge mosaic of cultures and languages in relationships of social and economic exchange. Today the Congo basin is fragmented into some 170 different languages, from three families, with Bantu languages forming the majority (Joiris and Bahuchet 1994). Within this variation are some 20 groups of hunter-gatherers, collectively known as Pygmies. These groups are scattered and internally varied both linguistically and in lifestyle. All Pygmy groups are living in complex socio-economic associations with farmers, which is reflected in the languages and cultures of both groups (Bahuchet 1985, Joiris and Bahuchet 1994). The non-Pygmy groups are the numerous swidden farmers who blend horticulture or agriculture with hunting, trapping, gathering and fishing in the streams and swamps (Harms 1987). Among many others groups, we can mention the Bulu, Bangando, Mpiemo, Ngbaka or also the Mbomo, or the BaKwele. Many of these groups have historically been associated with Pygmy specialists of hunting and gathering e.g. Mbuti, Aka, Efe, Baka...). They have thus formed pairs of groups with complementary economies, as well as complex social relations (Grinker 1994). However only about half of the broader sociolinguistic groups living in this region are in fact living in relationships with Pygmies.

1. Perhaps the most influential and well documented of these unfolded in the northern Congo Brazzaville timber concession where professionals from the Wildlife Conservation Society (based in New York City) worked closely with professionals from the timber company Congolaise Industrielle des Bois (based in Germany).

These pairs are in turn surrounded by other specialists, fishermen of two kinds, who hardly go inside the forest, but have developed hunting trade and horticultural practices along its banks. On the streams, professional fishermen which were also often producers of iron, and boatmen (e.g. Okande, Aduma on the Ogooue, Bondongo, Bobangi on the Congo, Monzombo, Yakoma on the Ubangi, Mbomotaba, Ngundi, and Pomo peoples on the Sangha...). Finally, along the Atlantic coast live coastal fishermen, like the Dwala, Batanga, Yasa, Benga or Vili.

Figure 7.2 The complex pluricultural settings of Central Africa



Mediated by the streams fishermen, these societies were forming long distance trade routes, diffusing iron, copper, ivory, feathers, raphia clothes, wood for dye, first between themselves, and then, from the 16th century towards Europe (Vansina 1962, Martin 1972, Sundström 1974). The same routes served as conduits for the Atlantic slave trade, starting at the end of 17th century. One century later, European explorers followed the same routes, using the same fishermen, at last initiating their not only commercial, but also administrative colonization of the heart of this continent.

Congo Basin Societies, unlike those of Africa’s coasts and dry regions, have been organized along clan lines with territorial “fission/fusion” dynamics, rather than lineage based hierarchies and corresponding tributary systems with more defined territories (Vansina 1990). Through complex alliance systems, they negotiated territorial and social relations with fluidity, enabling movement mainly along axes such as inland paths, or sometimes along water courses, by intersecting and sometimes intermarrying groups (Copet-Rougier 1997).

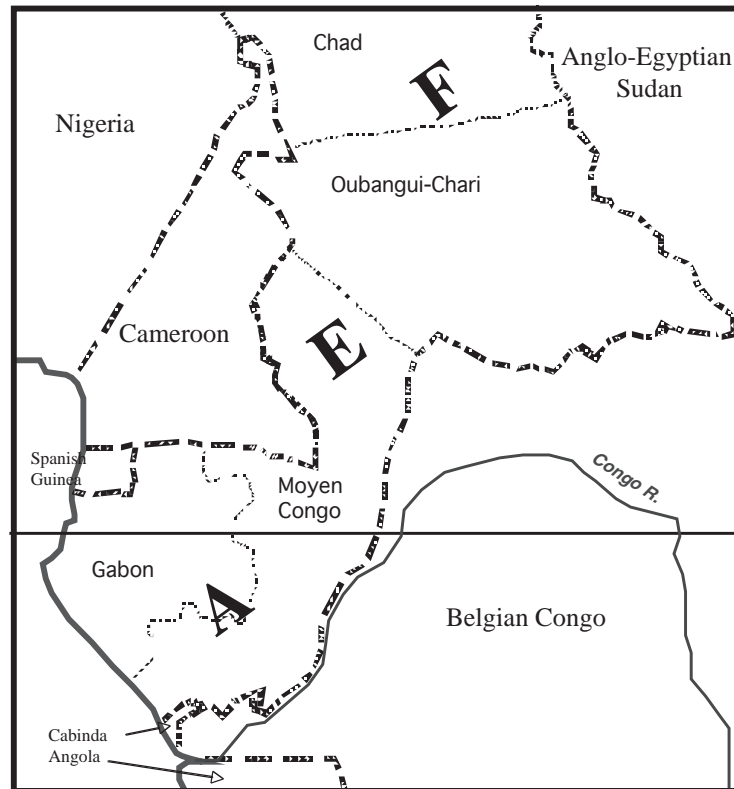
7.3 Colonial History and Consequences

Today’s national boundaries are inherited from this colonial past of Central Africa, which was divided between France, Belgium, Spain, Great Britain, and briefly Germany (until WW-I). Until early in the 19th century, Europeans and their direct activities were confined largely to a handful of harbours along the coast of Africa. Spain was present in the coastal Rio Muñi since 1856, this became later Spanish Guinea. They began to penetrate the forest not before the 1850s. It is only at the end of this century that the very heart was reached: the rapids were is now Bangui were reached in 1889; the junction with eastern Africa (British Sudan) in 1898 (mission Marchand).

The first European exploration missions did not appear in the Sangha River basin until the late 1800s. The explorers of three major imperial powers entered the resource rich heart of the continent. Henry Morton Stanley arrived in 1874 on an exploration mission sponsored by the *New York Post*. Later he followed the Congo River upstream, working for King Leopold of Belgium, mapping and opening the waterways of the interior Congo basin for trade (Hochschild 2000). Savorgnan de Brazza, an explorer of Italian extraction working for the French Republic, tried to penetrate the heart of the continent following Gabonese waterways, such as the Ogooue (1875). German explorers (Nachtigal and Tappenbeck in 1884, then von Morgen in 1889) tried to go northward.

The final results of this process were contingent not only upon these missions on the ground, however. The area was definitively divided during the conference of Berlin in 1884-1885: the German Empire claimed the Kamerun, King Leopold of Belgium claimed the Free State of Congo for himself (from the eastern bank of the Congo River) and in between the French Republic had jurisdiction over the territories now known as Gabon, Congo Brazzaville, Central African Republic (to the north and east of the River), and Chad forming the French Equatorial Africa (AEF). AEF had two territories with two administrations, Gabon and Moyen-Congo.

Figure 7.3 Colonial equatorial Africa until 1960

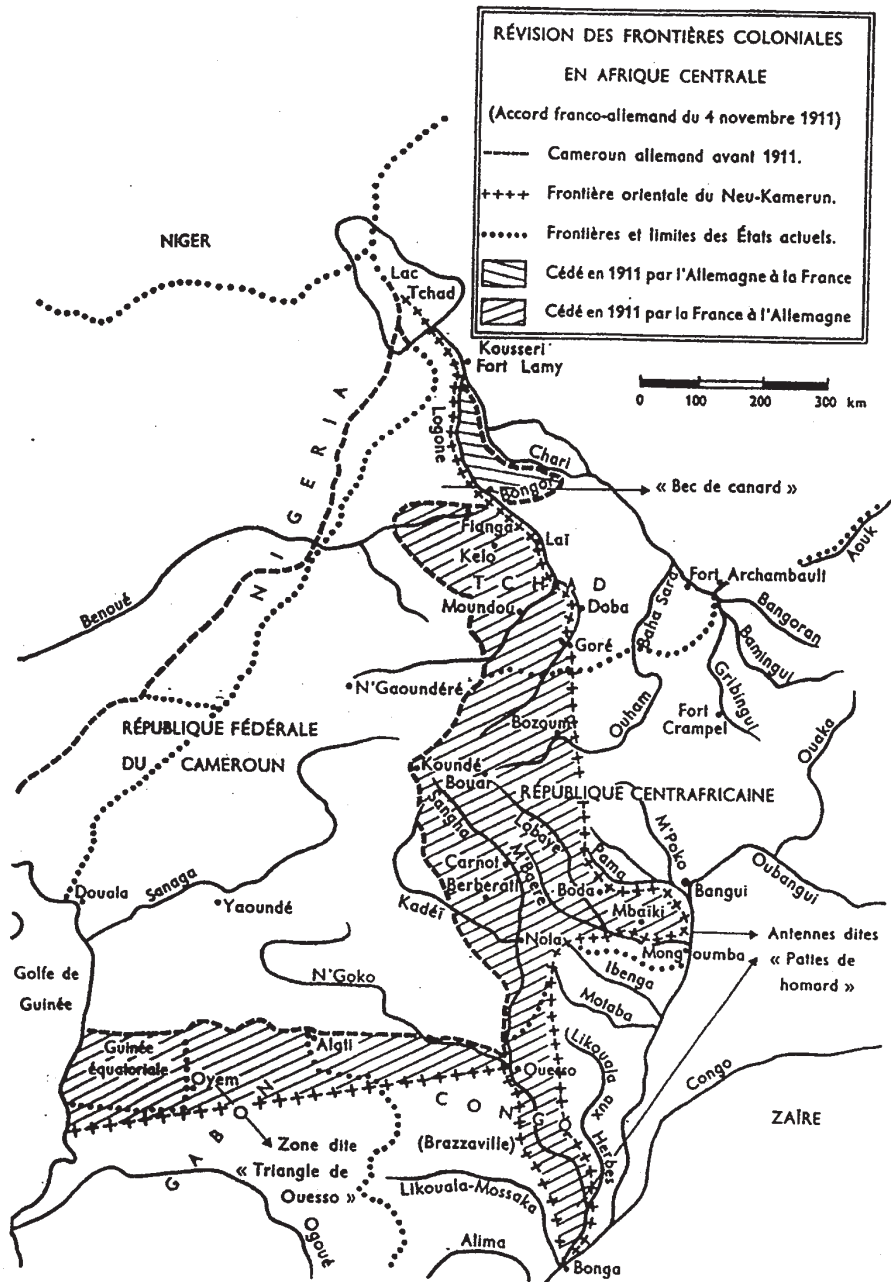


The multiple processes of “delimitation” did not cease with the conference of Berlin, however. Complex processes combining expeditionary science, military force, diplomacy, and dialogue with local and regional indigenous leaders continued within the western Congo basin during the 1900s. From 1900 until 1903 a German-French mission in the Sangha region, for example, was one of the first joint efforts to fix firm coordinates for the frontiers between the two colonial territories. Though the success of the mission depended upon the collaboration of the two teams, incidents of outright hostility often arose. In delimitation dossiers from both German and French colonial archives, the same general climate of subtle but severe antagonism seems to reign as French and German teams make their separate ways through the forests of the Sangha region:

“...as a result of a tendency which I have remarked among certain members of the German brigades, I felt it necessary to recommend that my Brigade leaders... maintain a certain reserve to prevent overly cordial relations: for example avoiding the exchange with our colleagues of the word: amicable.” (From a confidential report from the confluence of the Ouham, March 18, 1913, CAOM carton AEF 2d50).

In 1911, the French exchanged part of AEF with Germany against Morocco, with the result that border of Kamerun extended until Ubangui river, separating northern AEF from Congo.

Figure 7.4 Sangha basin territory ceded by France to Germany, then back again, around the turn of the century



"L'A.E.F. sacrifiée pour le Maroc", Kalck, *Histoire Centrafricaine*, p. 288

Later un-done by the Versailles treaty, the transfer rankled a great deal at the time. French Administrator Periquet's letter, December 12, 1911, to the Governor General of Equatorial French Africa illustrates the extent to which relations with local populations had already assumed a crucial importance in this contest for territorial and political control:

"Along almost the entire border the neighboring villages were French. The relations I had with them were excellent, they assured me of their Francophile sentiments, but in the end they allowed themselves to be tempted by the insinuations of the German authorities, insinuations about which the indigenous chiefs had briefed me and which

were the following:

- The Germans are richer and stronger than the French, who won't be able to protect you against us; if you don't come voluntarily we will bring you by force;
- The French collect taxes from you and we, on the contrary, we give you gifts;
- The French don't bring commerce to your homeland." (From CAOM carton AEF 2 (D) 50).

World War I thus occurred also in Central Africa, as French and German armies confronted one another, implicating locals as well. With the Treaty of Versailles, the previously ceded area known as *Neu Kamerun*, or the western part of what is now known as Cameroon, was taken from Germany and placed again under French "protection" while its eastern part, bordering Nigeria, was under British authority. AEF was thus reunited. In the 1920s, as the rubber boom unfolded, Moyen-Congo and Oubangui were separated, with two different administrative capitals (Brazzaville for the Congo, Bangui for the Oubangui-Chari. Cf. Suret-Canale 1977).

Slowly the colonial power set up its administrative organization, dividing territories in a network of counties and villages whose chiefs were not traditional but nominated to leadership posts by the administration. These processes simplified and rigidified the more nuanced political and territorial processes of forest residents. Further, these processes defined boundaries of colonial territories, but also of their internal trading concessions and conservation areas. The results divided and newly demarcated populations: the same ethnic groups are located on each side of many borders, including the Pygmy hunter-gatherers. Group identities still relevant today emerged from colonial exploration, exploitation, and delimitation practices of recruiting labor and forcing migration.

On the one hand, groups previously cohabiting were divided and developed distinct identities from this colonial boundary-making (both international and local). On the other hand, the regrouping of various ethnic groups into the same settlements, created convenient but artificial ethnic entities. Some new ethnonyms united distinct ethnolinguistic entities under new names, such as "Pahouins" in Gabon and Cameroon, covering all the people of the Fang linguistic group, as well as the groups of other languages but associated with them. Some such new identities referenced political and geophysical borders. The "Sangha Sangha" span ethnolinguistic groups across national boundaries in the Sangha River basin, encompassing both A80 and C10 Bantu Language speakers known to the earliest explorers distinctly respectively as "Ngoundi" and "Pande" (Hardin 2000). The same was true for "Pygmies," thus named by Europeans who were impressed by the smaller body size of foragers relative to their farming neighbours. However, this encompassing ethnonym took no account of the specific cultural identities of these small groups, nor of the diversity of their settlement practices (Bahuchet 1993a).

In short, the processes of defining, delimiting, and enforcing territorial boundaries has long been contested, yet formative of social identities for both Africans and the others who compete with one another for control over African resources in the western Congo basin. Such fluidity and complexity of cultural encounters did not, however, prevent the impositions of boundaries from becoming associated in social memory with processes of brutality and repression (Jewswiecki 1986). This brutality was most evident in the concessionary economies of the region, with origins at the turn of the 20th century.

The Concession Companies

French and German African colonies were allocated to private companies for their economic development. A decree from 1899 created the *Compagnies concessionnaires* in French Equatorial Africa. The land was divided into tenth of concessions were allocated to foreign companies for the exploitation of ivory, wild rubber and mineral resources:

"Thus the forty or so concessionary contracts that were signed in 1899-1900 for periods of thirty years granted the companies full usufruct of the conceded lands, including the rights to agricultural, forest, and industrial exploitation, but reserved mining rights in the hope of granting them at a later date. (...) In exchange for its prerogatives, the concessionary company paid the colony an annual fixed sum, which was augmented by a percentage related to area and profits." (Coquery-Vidrovitch 1998: 75).

Meanwhile, the colonial state did not invest in local infrastructures, relying upon the companies for it. So, according to Coquery-Vidrovitch, "With no administrative or judiciary controls in place, abuses were legion." (1998: 77). Cantournet (1991), however, notes that overall, human and other resources for effective concession management were lacking during the colonial era, and that much of the effort put into establishing them was a result of systematic over-evaluation of the area's productive potential. His description of the details of the concession system in French Equato-

rial Africa nuances Mahmood Mamdani's (1997) view of the concessionary system as a sort of "indirect rule" that was imported and perfected in Africa from the experiments in economic extraction and colonial administration in India:

"The status of the Congolese concessions was close to the ones of the East India Company, as they had a similar monopoly on exploitation of all natural products. But the fundamental difference was the total absence of the delegation of sovereignty. The local administration kept integral power, notably in terms of police, but in principle had to support as much as possible the commercial activities; that said there were to be no physical constraints for locals." (Cantournet 1991 :15 : Translations by the authors.)

The companies, in return, were to give the state 15 percent of their benefits, provide their own transportation, pay the cost of police forces requested in their zones, maintain plantations to compensate for tonnage exported, help with customs posts, and other minor requirements (Coquery-Vidrovitch 1998; Cantournet 1991:13). Ultimately, however, Cantournet cautions against thinking of the mosaic of concessions in the region as a full-fledged "concessionary system."

"Inasmuch as the word assumes a certain logic in these actions, with clear directive ideas and coherent execution, it seems not to suit the old Congo, nor even the French Equatorial Africa that was its successor. It seems that it is giving too much credit to the colonialists of the early part of this century, be they civil servants or commercial agents, residents or metropolitans, to think that they were capable of conceiving and especially of carrying out "systems" when in fact the scarcity of material means, financial and human resources condemned them to a kind of permanent improvisation, sometimes with tragic consequences." (Our translation, op. cit. 1991:15).

Perhaps they were not "systems." But they were powerful legacies, nonetheless, where kinship and alliance networks combine with circumstances of cruelty and shared cultures of wealth extraction and leisure to shape the exercise of political power by mixed European and African elites in much of the Congo basin (Bigo 1988).

Local populations were directly concerned by this process, as the primary labor pool for these Companies, collecting rubber on a permanent basis, which obliged them to live in camps in the forest, carrying the products, the goods and the equipment on their back. Further, communities were constrained to produce cassava to feed the workers. Hunter-gatherers as well felt the strain of these systems on their subsistence practices : many had to hunt harder for ivory, meat, and later on for animal skins to feed the growing glove and leather industry in Europe (Bahuchet & Guillaume 1982 ; Guillaume 2001).

These arrangements were unwieldy, and not always profitable. They persisted because the calculation of rewards for concession operators has never been, and is not today, merely economic. It is also profoundly political; strategic; symbolic. How did it apply to the early conservation efforts that also took place in these colonial territories where families became so intertwined through the intimacy of patronage and exploitation?

Environmental Protection

Discussions about establishment of protected areas began in the late 1920s in AEF. A decree issued on August 25, 1929, forbade Africans to live in or even enter parks. Efforts to identify areas where human settlement was scarce began what might be called *prospecting* for pristine places. M. Saint-Floris, a hunting inspector for the colonial administration, traveled in AEF for 20 months and submitted regular reports. He saw no need for protected areas in Gabon, due to the impenetrability of the forest and its few, big animal species.

In CAR and Tchad, however, game parks were recommended, in conformity with the procedures stipulated by article 25 of the decrees established on September 25, and December 10, 1933. A special commission submitted a proposition to the Conseil de Gouvernement of AEF. On January 5, 1934, that proposal was accepted, and conservation concessions, as it were, became a reality (Antonneti 1934 :2). By 1935 a system was elaborated that included the existence of scientific, sport, and commercial permits to hunt (Marchessou 1935). By 1944 decrees had been passed, formally recognizing the protected areas and providing for surveillance of some of the most important (or centrally located) ones (Anonymous 1942).

Despite the restrictive tone of the legislation, they were softened in the case of privileged European hunters and their Central African chums. Under lobbying pressure from the International Hunting Council international arms control was liberalized. This facilitated the circulation of arms across international borders, lowering taxes and requiring a simple title by an appropriate authority (such as the Council itself) stating that the weapon was used only for hunting

(Edmond-Blanc 1937: 2). The spatial definitions of bounded territorial units for management were bolstered by strict legislation constraining use by all except certain elites. Thus emerged a precedent that persists in today's frequent border-hopping practices by logging interests, safari operators, and, increasingly, conservationists.

The power of concessionary arrangements lay precisely in what was to become their expansive reach, both across national territories and between elites and other actors over time. Such understandings, still present in the forms of dynastic families that have persisted in trade (perhaps particularly in mining and logging) bind contemporary actors to one another, and to the past, even as they transform the present. In this sense, areas protected for their biodiversity or heritage value are also, concessions. They are similar to extractive concessions in their establishment through processes of prospecting, delimiting, and negotiating with local actors. And, like extractive concessions, they entail intimate engagements between local and transnational actors for their success. While in tension with proliferating extractive concessions, protected areas also resemble them, and point to the ironies of discourses about the protection and management of nature in African contexts where so many actors, Africans and others, elites and laborers, have long been co-authoring land management systems in powerfully flexible and fragmented way.

7.4 Today's Rainforest: Expanding Conservation, Intensifying Industry

The Congo Basin is not considered as a *biodiversity hotspot*, a designation based upon a given area's number of endemic species (Myers et al. 2000, Myers 2003). However, the large scale of a rain forest ecosystems very rich in biodiversit has made impossible to neglect this region from a conservation standpoint. It has been primarily described as a *wilderness area* (Mittermeier et al. 1998, Mittermeier et al. 2003) ; an ecoregion (WWF) and more recently a living landscape (WCS) :

“Whereas the hotspots consist mainly of heavily exploited and often highly fragmented ecosystems greatly reduced in extent (usually < 25 % of original pristine vegetaton remaining), the major tropical wilderness areas are still largely intact (> 75 % of original pristine vegetation remaining) and have low human population density (< 5 people/km2).” (Mittermeier et al. 1998: 516).

“A wilderness area is defined in The World Conservation Union (IUCN) Framework for Protected Areas as “a large area of unmodified or slightly modified land and or sea, retaining its natural character and influence, which is protected and managed so as to preserve its natural condition” (Mittermeier et al. 2003: 10309).

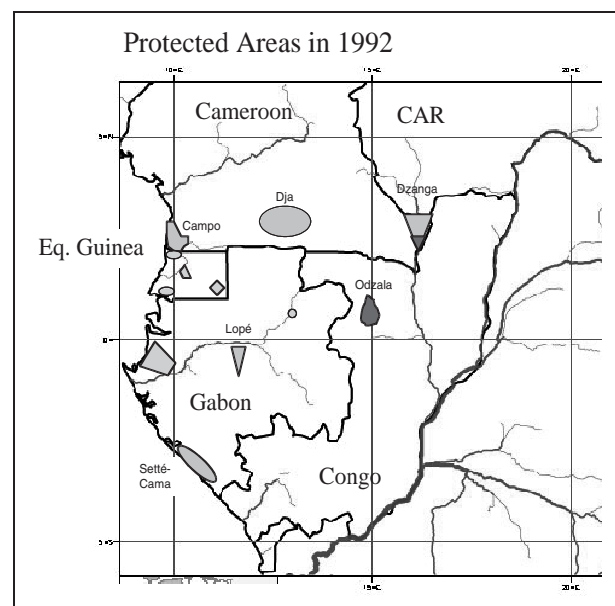
Nevertheless, conservation was, and still is for this region, highly influenced by the presence of very large mammals: forest Elephant (*Loxodonta cyclotis*), forest Buffalo (*Syncerus caffer nanus*), Bongo antelope (*Boocercus euryceros*) and the Apes (*Gorilla gorilla* and Chimpanzee *Pan troglodytes*).

Conservation In The Congo Basin : Proliferation of Protected Areas

Colonial rulers had established a few faunal reserves in order to preserve these prestigious mammals for trophy hunting. That process had privileged areas with low human population densities for such reserves. Alternatively, the designation of an area for conservation purposes entailed making people restrict their use for those areas, and even at times entailed destruction of the settlements without regard for whether, as temporary or permanent settlements, they reflected ancient access and use patterns such as those described above.

During the postcolonial era in these regions, state elites held romantic views of such conservation areas and indeed of their human residents. Authors of policy reports and novels alike depicted forest dwellers as pure primitives, repositories for elements of primor-

Figure 7.5 Protected areas, 1992



dial African pasts that offered alternatives to and redemption from what Mbembe has called “the banality of power” in African postcoloniales (Hardin, in press). Such attitudes did not recognize the contributions such forest residents had made to national economies and political histories. Nor did they overturn dominant practices of “coercing conservation.” Rather, in the latter decades of the 20th century, many African states received military aid and training for “anti poaching” patrols to whom it then fell to monitor and secure the overlapping political and park boundaries. These relationships between increasingly well armed and trained park guards and park inhabitants became increasingly tense as the parameters of forest use were gradually transformed among Africans themselves, in conjunction with expanding international capital and non governmental interests in the resource rich region.

Then, following the Rio conference, came an acceleration, catalyzed by two different developments. On the one hand, growing public and scientific awareness of the richness and fragility of the rainforest ecosystems, leads to the rehabilitation of existing protected area, issued from the colonial period. In 1992, the European Union launched the international program ECOFAC (“*Ecosystèmes forestiers d’Afrique centrale*”), a network of five countries, whose aim was to develop one protected area per country: Cameroon (Dja), Equatorial Guinea (Monte Alen), Sao Tome (Obo), Gabon (Lope), CAR (Ngoto). The concept followed the ICDP model of Integrated conservation and development projects, which had emerged in part as a response to increasingly overt clashes between rural populations and park management forces, especially in East Africa. The WWF-US created the Wild Lands and Human Needs Program, the first in a long series of NGO initiatives to include residents of protected areas in the planning and zoning processes, and to generate economic revenues to offset their constrained access to their resource base. Expert knowledge in methods such as rapid rural appraisal, focus group meetings, and mapping of community needs became for the first time a key component of conservation process. Further, management became increasingly integrated across national contexts; the experience of one area was supposed to be shared by the others, thanks to regular meetings of the steering committee, every time in a different protected area of the network.

On the other hand, the presence of the large mammals came into force in the conservation policy in the early 1990s. Balance between single-species management (of flagship, umbrella, endangered species..., cf. Simberloff 1998) or conservation of whole regions or ecosystems (e.g. Noss 1996) is not an easy one:

“...flagship species will still come in handy for fundraising and education. But there are signs that public cares about ecosystems. For example, people want to save the rainforest, not just monkeys and parrots.” (Noss 1996 : 351).

Not surprisingly, forest species such as elephants, gorillas, and chimpanzees, as well as whales and sea turtles in the Atlantic Ocean, played a role of flagship species (i.e. “a charismatic large vertebrate, (...) that can be used to anchor a conservation campaign because it arouses public interest and sympathy” Simberloff 1998: 247) for fundraising in the North. However, some of these species were considered by rural farmers as pests for agriculture and source of danger; such differences of perception led to any intercultural management challenges in the increasing networks of protected areas. What is important to retain for the purposes of this paper, is that the coincidence of what Walley has termed “social drama” in conservation with massive mortality of flagship species played an important role in enabling the emergence of transborder conservation.

Elephants and Gorillas

In the early 1990s, a dramatic slaughter of forest elephants was reported in various parts of the Congo basin (Fay et al. 1993). This was due to the shift from African savannas to the rainforest regions of ivory trade for Asian countries, after the ban of Elephant hunting in the CITES (1990). At that time, the rainforest regions had comparatively few protected areas and those that existed were without adequate monitoring. In response to these massacres, and media attention to them, conservationists and their backers created an international monitoring project at the 11th conference of the parties of the CITES, in 2000. The project was known as the MIKE, or “Monitoring the illegal killing of elephants” (Blake & Hedges 2004).

In the same period, novembre 1994, ape corpses were discovered by tens in the Minkebe region of North-east Gabon (Walsh et al. 2003, Bermejo et al. 2006, Lahm et al. 2007). A few weeks later, a first human outbreak of lethal haemorrhagic fever occurred in the same region, around Makokou, killing some 30 persons within a few days. This was the first occurrence in the western Congo basin of a fever first observed in northern DRC in 1976, along the river Ebola. From 1994, several outbreaks of Ebola haemorrhagic fever occurred in northern Gabon and along the western

border between Gabon and Congo, three times from 1994 to 1997, and again twice in 2001 and 2003, killing some 400 persons. Every time, the outbreak began with a hunter manipulating a dead body of chimpanzee, gorilla or even duiker, found in the forest.

International public attention had been captured ; this fever is highly contagious, death occurring within two weeks, with a mortality of 80 % ... (Formenty et al. 2003, Leroy et al. 2004, Pourrut et al. 2005). Each time observers reported dramatic and extremely high mortality of any kind of animals, not only apes, but guenons and ungulates as well (duikers, bush pigs). It is estimated that tens of thousands of apes were killed by the virus (Bermejo et al. 2006). Without doubt, transmission occurs between individuals in the same groups. Further, such transmission can diffuse an outbreak between ape and human populations, killing both hosts equally quickly (12 days) and surely (80 % mortality, see Bermejo et al. 2006, Lahm et al. 2007). It seems quite clear that ape populations, previously very high in this region, has been in a very few years decimated and by this viral disease, and thereby also fragmented and made more vulnerable to intensifying hunting pressure:

“Add commercial hunting to the mix, and we have a recipe for rapid ecological extinction. Ape species that were abundant and widely distributed a decade ago are rapidly being reduced to tiny remnant populations.” (Bermejo et al. 2006 : 1564).

Conserving Landscapes

These dramatic events, together with the realization by biologists from international NGOs and IUCN that large areas of inland rainforest were still under relatively low pressure from logging (Ruggiero 1998), were seized as an opportunity for the creation of new protected areas, on large scale, according to the concept of ecosystem, “...the best conservation strategy lies in a synthesis organized around the central concept of ecology: the ecosystem.” (Noss 1996).

In order to offer large zones for the threatened big mammals, the model of connected protected areas overlapping state borders was privileged (Fay 1998 ; Doumenge et al. 2001: 14). While conservation biologists were trying to attain conservation planning at the right scale (cf. Redford et al. 2003 for an overview), several researchers at the WRI coined the term “frontier forests” and thereby attracted philanthropic attention to the truly vast forests left on the planet ; the Great Northern Forests of North America (and Siberia) ; the Amazon, and the Congo. WWF invented a new concept to structure their policy and project efforts: the *ecoregion*. WCS concomitantly committed itself to ideas of *landscape*, albeit with a very weak relationship to actual landscape ecology, if we trust the reports. It is also true that this notion of landscape is used in a variety of sense (see Sanderson et al. 2002, defining the concept of “landscape species”).

In April 2000, WWF convened in Libreville an expert workshop, during which biologically important areas were identified (covering 54% of the basin!). This led to the delineation of 11 “priority landscapes” for conservation intervention (more than 700 000 km² ; Kamdem-Toham et al. 2003). These landscapes consist of:

“...forest blocks with the highest conservation value (their selection was based on a region-wide evaluation of a broad range of biodiversity features, such as species richness, species endemism, higher taxon uniqueness, and unusual ecological or evolutionary phenomena)...” (Kamdem-Toham et al. 2003: 346).

The most striking feature in this brief history of shifting conservation paradigms and practices is not the impulse to protect entire extraordinary ecosystems. Rather, it is that local states and administrations are in many respects reduced to the role of bystanders in this process. They have to be convinced of the rightness of the choices made by (mostly) foreign researchers, after wildlife inventories (or, in more historically and economically evocative terms, prospecting) by (mostly) foreign researchers, and based upon ideas created by (mostly) foreign researchers, policy makers, and donors. Local administrations have only to sign on the dotted line, and in some cases impose conditions of service and infrastructural provision by the NGOs and private companies (such as tourism or hunting operators) who thus become, in effect, “cessionnaires”. In Central Africa, then, whether issued from colonial heritage or present day creation processes, not a single protected area can be said to have been born from a local initiative. This is not a nuanced anthropological observation, however it is an important one, connecting as it does the cultural and territorial logics of conservation with those of extractive industry in the area since the late 1800s.

But let us return to the history of the present, and to conservation initiatives currently underway : in the Congo Basin, two different transborder projects have been set up.

TNS: The first to emerge was the Tri-national Sangha Conservation area, starting in late 80s (Fay 1998). Three

new national parks were created in contiguity: Dzanga-Sangha in Central African Republic, managed by the World Wildlife Fund, Nouabale-Ndoki in Congo, managed by the Wildlife Conservation Society, and later Lobeke in Cameroon, also a WWF project on both banks of the Sangha River. These U.S. based NGOs have been joined by Swiss and German organizations as well, but through their novel partnership with a powerful logging company WCS held a kind of leadership role in the initiative. It is to be noted that timber concessions cover 71 % of the area of the new WWF TNS landscape.

TRIDOM: The aim of the second project, the more recent “Tridom” (for “Tri-national Dja-Odzala-Minkebe”), was to link three existing protected areas, but not in contiguity, Dja in Cameroon, Odzala in Congo (two old reserves) and Minkebe in Gabon (the most recent one), through corridors joining them. WWF is the initiator and leader on the TRIDOM. This project was recently enlarged to encapsulate more protected areas, meanwhile Odzala was tripled (2001). In 2005 a cooperation agreement was signed between the three countries, for setting up and managing collectively the transboundary complex of protected areas. This complex now includes nine different protected areas covering 25 % of the whole area, together with logging concessions, and one huge iron mine (Belinga, to be exploited by a Chinese company)... How all of that will work remains to be seen.

Box 7.1. Conservation Phases In The Congo Basin: Protected Area Proliferation

1. Colonial era : Creation of faunal and forest reserves, with forced displacement of local populations (often brutal).
2. Postcolonial era 1960-1980: Increasing dependency on multilateral and bilateral organizations, attempts to “settle” and sedentize forest peoples and other nomadic or semi-nomadic peoples. Initial transnational investment in logging and transport sectors.
3. Era of Expanding Non Governmental Organizations 1980-90s : Integration of conservation and development projects ; transnational implementation of biodiversity conservation through resuscitation of protected areas.
4. The Closing of the Forest Frontier 2000-2005 : Zoning Processes and proliferation of protected areas ; Implementation of Legal Reforms, and Intensification of economic activities.
5. Emerging Enforcement Paradigms 2005-: Territorial and resource control increasingly linked to concepts of international security ; bushmeat crisis extends enforcement of codes and laws in and around protected areas ; development of corridors, certification processes, customs and policing capacity building transnationally...

Congo Basin Forestry: Political and Policy Context

As NGO actors have been honing their tools and terms toward more effective and comprehensive conservation processes, international diplomatic and policy processes have been encouraging central African heads of state and government officials to seek more integrated political and economic regional organization. This slow and recent set of transformations has been punctuated by several highly public and novel moments:

- In 1999 the Yaoundé Heads of State Declaration was approved by the UNO general assembly by a decision of 54 to 214;
- In 2000 The Congo Basin Forest Partnership was born, pouring unprecedented amounts of US aid money into regional level meetings and planning sessions aimed at coordinating across government, industry, and civil society sectors;
- Also in 2000 the Conference of Ministers of Forests of Central Africa or COMIFAC came into being with the general objective of helping the countries of that region “sustainably and collaboratively manage the forest resources of the subregion, along with a network of protected areas that represents the biological diversity of these ecosystems for the wellbeing of their populations, and for the health of the planet” (translation ours).

We can thus see the emergence of several key strategic axes along which state, corporate, public, and community actors are increasingly engaged: harmonizing fiscal and forest exploitation regimes; the elaboration and implementation of international conventions and agreements; the formulation and reforms of forest policies; obtaining better data and analytical understanding of forest resources (through inventories, regional observations, and remote sensing technologies); management; conservation (especially focused on transborder conservation areas); certification and supply chain transparency, tracability, and accountability.

The most recent developments include a new articulation of UNESCO mechanisms such as the “Central African World Heritage Forest Initiative” with what Counsell and Arnaud (2006) have called the neopatrimonial African state. They describe that state as one constituted by complex cross cultural relationships among economic elites, where concessions are crucial to power relations and territorialized patron client relations of national governance for and with the interests of transnational capital at heart.

Finally the FLEGT: “Forest Law Enforcement Governance and Trade” declaration gives concrete shape to what we are terming a new era of emerging enforcement mechanisms (see text box). To date, most reforms of forest use have been at the policy level rather than at legal levels, and we now see:

- Changes in Laws, regulations and policy
- Significant increase in financing for forests
- Higher profile and role for industry, community, NGOs.

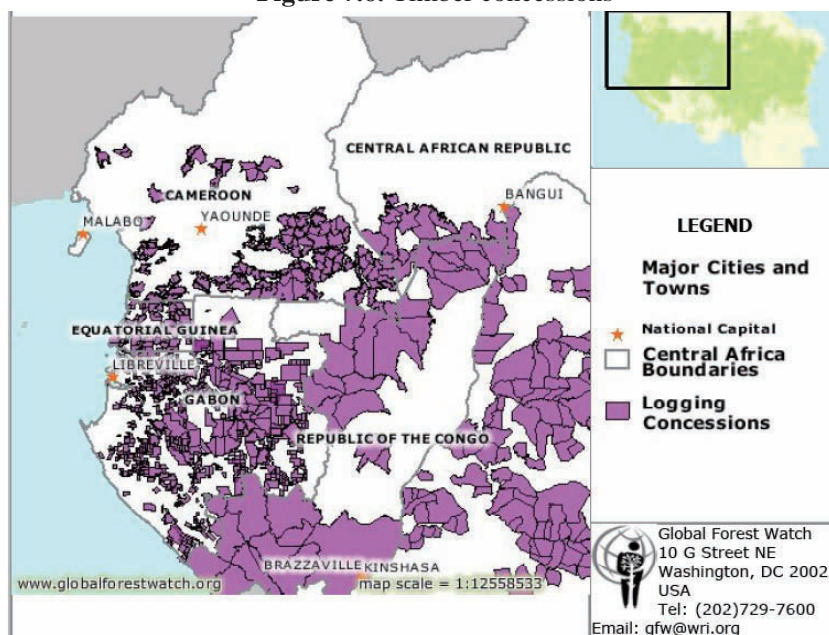
All of this is fostering an emerging Forest Peoples’ Political Movement.

Timber Industries in Transition

The innovations in and impositions of conservation strategies we have just described are far from occurring in vacuum. Today’s Central African economy is in many ways the result of colonial organization. Land and forest belong to the State at 90 % (“Domaine de l’État”). Private and foreign companies get long term permits for logging and mining (Karsenty 1999, Grut et al. 1991, Hardin 2002). A transboundary business elite is also more active than ever in prospecting, delimiting, and managing concessions for the extraction of natural resources. We will focus here on the timber trade, since it is the one at this time most tightly intertwined with conservation in the western Congo basin.

In the last twenty years, timber production has doubled (from 8 millions m³ to 16 millions m³), and States have allocated now almost the totality of their rainforest territories to exploitation.

Figure 7.6. Timber concessions



In Central Africa, the logging industry is highly selective, removing a small number of trees (one to two per ha or about 6 m³/ha) from a very small number of species (three species accounting for 66 % of the total production, and 16 sp. counting for the next 33 %... on a total of 35 sp ; Ruiz Pérez et al. 2005).

A recent survey gives a picture of the logging in Central Africa (Ruiz Pérez et al. 2005). The results suggest two clearly differentiated logging periods: an old phase (1950 to 70), dominated by large, foreign concessions, and a new phase, the last 15 years, where national concessions are gaining space. The younger concessions are more varied in size, ownership and markets, with significant contribution of national capital (Ruiz Pérez et al. 2005: 225, 234). Size varies from 1,800 to 1 million hectares, but the general size is around 400,000 ha. The mean rotation is 30 years, but

smaller concessions tend to operate on shorter rotations (15 years or less). There are indications of a general trend for large-scale concessions to respect cutting area rules whereas small concessions may be less inclined to do so (Ibid: 232).

Authors underline a gap between forest laws and regulations requiring management plans and their actual implementation :

“The lack of human, financial and technical resources for the national forest administrations is one of the key factors at the root of this problem. Old, large foreign owned concessions tend to use management plans more frequently than recent, small, nationally-owned concessions.” (Ruiz Pérez et al. 2005: 234).

However, we can observe a change in the overall organization of logging activities, due to :

“...a dramatic increase in foreign investment in tropical logging, especially by Malaysia, Indonesia, South Korea and other Asian nations. These nations are rapidly depleting their own timber supplies and have begun to tighten domestic controls on their aggressive logging corporations. These logging corporations are now moving overseas, to the Pacific, Latin America, the Caribbean and Africa, in search of new sources of timber.” (Laurance 2000: 433).

China is particularly active in seeking economic influence in Africa, based upon a principle of “non-ingerence”, which differs from the policy of occidental countries (Europe, USA). Niquet (2006) has noted that more than 80% of African timber, whether logged by Chinese companies or not, is exported to the PRC. She also notes a predilection for the timber sector among Chinese investments in Liberia, Gabon, Equatorial Guinea, RDC, and Cameroon. Further, Niquet documents the Chinese takeover of western companies and their vast exploitation zones in Congo and Cameroon. In the last ten years, China’s total forest product imports more than tripled in volume, from 40 million to 134 million m³, among which Central Africa (Gabon) counts only for few percent at present (White et al. 2006: 6, 12). What changes in these numbers may mean for African forests is difficult to predict. Models for the value of forests in terms of carbon production are emerging, but are still inadequately informed by detailed ethnographic, ecological, and economic research on the ground. Meanwhile, what we do know about different types of operators in this sector suggests that while European companies are increasingly constrained to participate in certification processes, many Asian ones are not eager to do so, and nor need they do so (*cf.* Karsenty 2007).

We have noted, in field visits to newly Chinese and Malaysian company sectors, that the intensification of road networks within these concessions also appears to characterize the practices of these newer operators. Laporte et al. (2007) document an accelerating rates of logging road construction, accounting for 38 % of the length of all roads. This underlines the context of rapid frontier expansion inland Gabon, southeastern Cameroon, northern Congo, as well as central DRC.

The map of this increasingly fragmented concession actually shows several generations of roads. The polarization of the roads towards the Sangha river reflects the fact that in the 1970s and 1980s timber was transported on the Sangha southward toward Brazzaville and Pointe Noir by navigation. Today, that same orientation is because timber from northern Congo reaches the Atlantic harbour through the roads of Cameroon.

More work is needed on these elements, which constitute a complex social matrix shaping forest policy in the region. Many of the most successful operators in the logging sector are also inveterate border-crossers. Powerful companies such as Rougier and Thanry have concessions in several countries throughout the Congo Basin region and some operators have known histories of evading taxes and promised provision of salaries or services by crossing the border and operating in the same forest, often with some similar regional elites or entrepreneurs, but within a different national context.

Almost all of the wood harvested in northern Congo and southwestern CAR is evacuated on roads that connect these regions to the port in Douala, Cameroon... so although policies vary widely, the region represents an integrated economy in many ways that presents a puzzle. Structurally it is incompatible with biodiversity conservation in the long term given the ecological and economic demands it creates and the way it relates to further in-migration by laborers to these fragile forest areas. Infrastructurally, however, it has contributed to the ease with which scientists, ecotourists, and project managers in transnational conservation areas can circulate, communicate, and carry out their work in the short to medium term.

7.5 Political Consequences of of New Functions for the Forest

Together with the creation of new protected areas, the Central African countries have come increasingly together to plan regionally for development. States delineate specific zones of use: forest exploitation, conservation areas, and then, some territories for the villages... Looking at the maps, it is obvious that these village areas are designed after the other uses, and only by reference at the major roads. In some cases (Cameroon), concessions are attributed for trophy hunting, surrounding protected areas (Lindsey et al. 2007). In many ways, this zoning seems the contrary of an integrated management approach.

Local people are forbidden to enter and to practice any kind of activity in the protected areas, forest management units and of course trophy hunting concessions.

This exclusion of the forest is a consequence of two considerations, one concerning slash and burn agriculture, another concerning the bushmeat hunting. The uncomfortable feeling is that biologists maintain confusion (consciously or by ignorance, who knows), between events of unequal importance, diverse historical roots and different actors. The myth of the virgin rainforest (reinforced by the misleading appellation of “wilderness area”) is never far... At the minimum, a real ignorance of the human history in the rainforest is perceptible, despite important books in the last decades (cf. among others Vansina 1990). Concerning the hunt, biologists lead since 10 years a campaign against it, under the term of “bushmeat crisis”. The number of papers is unnumerable (Milner-Gulland & Bennett 2003). However they all have in common to focus exclusively on the game, never trying to give any picture of the human context of the trade, neither to propose alternatives. The result is an increasing policy of repression, which is now extended far from the protected areas, provoking more and more problems towards the local populations. Only recently, biologists propose a new approach, less repressive and more realistic:

“We believe there is a need for international development and conservation agencies to adopt a more consistent and supportive approach to bushmeat policy development” (Bennett et al. 2006: 884).

Since half a century, all the theories concerning nature conservancy were tried in Central Africa, starting with the repressive policy of the colonial period, with displacement of inhabitants, followed by the tentative integration of conservation and development. For instance, the Dja “Réserve de faune” was classified as Unesco Biosphere reserve in the 70s. Rapidly, ICDP were discussed, their efficiency being unconvincing neither for the conservation nor for the development (Newmark & Hough 2000). However we can question the planification of these ICDP in Central Africa; it seems that the development part of them was constructed after the conservation project, as a complementary part – never the reverse. Even the creation of the new protected areas at the end of 20th century does not look to be linked to socio-economic impact studies. At the end of the 90s, biologists decided to stop development and to concentrate on the conservation part (cf. Gartlan 1998). Began then a strong repressive policy, not by the State agents, but by employees of the NGOs (“ecogardes”), which is still going on nowadays, as an application of the theories following the “bushmeat campaign”.

Despite some gentle papers in books, in the field the conservation policy is only repressive, as the misconception of the virgin rainforest... It should be so much better if only there were no humans... Maybe except the Pygmies... In Central Africa more than elsewhere, conservancy opposes wildlife to human beings.

As underlined by Chan et al. (2007), there are tensions between goals (conservation vs. human welfare), which can even lead to some kind of oppression:

“The question is how to achieve conservation given that economics is more likely than ecology to inform policy and that the same ethics that justify conservation also demand that we be mindful of poverty and associated human suffering.” (Chan et al. 2007: 60).

Given that protected areas concern only 10 to 25 % of the forest area, even in the transborder areas, what about the other zones?

Much ink has been spilled regarding the national and regional precedents set by Cameroon’s 1994 reform of forest laws to create “community forests”, specifically attributed to the local groups. While this approach has worked well in some other parts of the world (India, for instance) and even in some parts of Cameroon (the northeast, for instance) it has been applied only with difficulty to dense rainforest areas within Cameroon and the broader Congo basin. The reasons for this are myriad, and many can be inferred from the historical ecology of the region we have offered here. Most basically, given the DBH of mature rainforest tree species, they often require substantial mechanization to harvest. So,

while exploitation is submitted to community based management, that community must find ways to afford the coast of the planning for delimitation and planning, and find industrial allies to assist them with actual implementation of their plans. Very few have succeeded. However, until now, only very few of such forests have been delineated (some tenth of forests are classified)².

There is an uneasy fit between these decentralized parcels of forest management and the practices of transborder conservation, which seek larger expanses of land with effectively protected corridors for the movement of wildlife through landscapes. Those villages are under pressure of the so-called 'landscapes protection areas'. People who used to live in the forest on their own are now forbidden to use many forest resources and to engage in some activities. Geschiere (2004) goes so far as to suggest a "xenophobic" effect between communities in Cameroon after the introduction of legal reforms to the forest sector in 1994; how can we understand this in terms of space, place, and practices of subsistence? How can we consider it in terms of emerging possibilities for new environmental politics?

7.6 Conclusions: Emerging intercultural conflicts

Recent years have seen volatile accusations of human rights abuses perpetrated against hunters and gatherers by locals armed as anti-poaching guards. This has occurred in the Nouabale Ndoki National Park area of northern Congo, and in the Dzanga Sangha Reserve area of the CAR. Elsewhere, in North Gabon, the tables are turned, yet tensions still simmer. Along the border of Minkebe National Park (TRIDOM area), Baka Pygmies are selected as park guards, producing increasing conflicts between farmers and Baka, former associated partners in the exchange of forest products (cf. Castro-Larrañaga 2004).

These social dynamics of conflicts, and emerging new partnerships, claims, and social movements within transborder conservation areas must be considered in their broader political, economic, and geographical context of decreasing implication of State agencies, at the local level, toward more implication of international NGOs and transnational corporate actors. One key tension in contemporary debates about trends in forest tenure worldwide has to do with trends toward reinforcing the security and clarity of rights to land. Far too little is being debated about the concomitant reinforcing of political identities in these regions.

A novel event took place in April 2007, in Impfondo, in the middle of Congo: a very new "Network of Indigenous and Local Peoples in Central Africa for Sustainable Forest Management", founded by Congolese (RDC) Twa-born Kapupu Muti Manwa, held its first large meeting, thanks to funds by WWF, World Bank, GTZ, UNICEF, UNEP, WHO, FAO, IUCN, and National Forestry Private Sector Congo.

The aim of this network is to link the various "indigenous peoples" of Central Africa, and for this, its founder travels tirelessly throughout the region, visiting as much Pygmy groups as possible. This is a key example of a surge in ethnically-based approaches to claims about rights and partnerships for environmental governance in Central Africa. Recall, however, that many of these ethnic identities emerged from cross cultural encounters during the colonial era, and were strengthened or idealized during postcolonial politics. Do meetings such as this signal the stirrings of cross-Congo Basin political identity among hunter-gatherers at present?

Because of their dispersion, groups of hunter-gatherers generally have no knowledge of the existence of other similar groups in other countries. One exception, the Hunter-Gatherers of both banks of the Sangha River. They use now the identity of Bayaka (or Yaka) to connect together Mbenzele (Bantu speakers) and Baka (Ubanguians speakers) :

"Mbenzele refer to all Pygmy people they know as Yaka (...) and consider them to be forest people regardless of which language they speak" Lewis (2002:50).

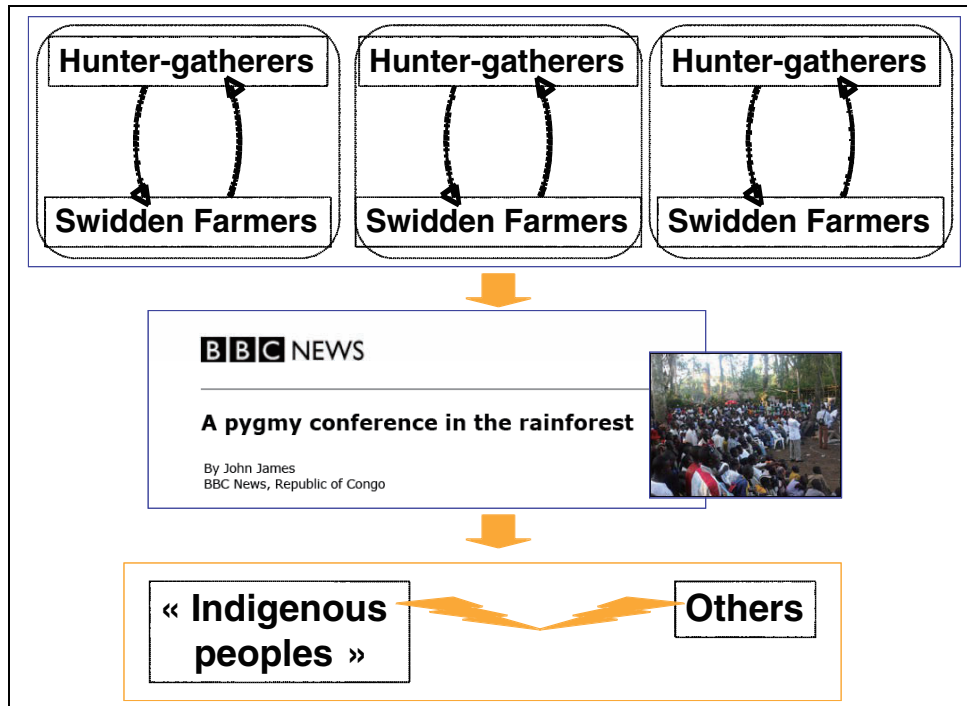
At the same time, many development projects have focused with a kind of "positive" discrimination on bringing health care, formal education, and agricultural development models to Pygmies. Such initiatives, in part because they exclude other local populations, can create a diffuse jealousy from farmers towards hunter-gatherers. This sentiment is not unfounded, given the weakness of public services in the forest provinces. For many farmers are themselves also

2. "Experiences in Cameroon with institutionalized "community forests" have shown mixed outcomes, where replication of the rent-seeking pattern (i.e. where actors seek to take advantage of any monetary advantage they can grasp thanks to their social connections and through rights claims, without being held accountable for their practices) was observed, rather than autonomous development." (Karsenty 2007)

“forest people”, or long term residents who claim deep belonging to these lands, stating “my mother’s placenta is buried in this place...” (Hardin field notes). They, too, are accommodating new neighbors and new ways of valuing and using land. No more than forest foragers with whom they have long been involved should they be expelled from their territories.

Indeed, the kinds of pair these peoples ancestrally formed was based upon both economical and social relations that entailed complementarity but also inequality and sometimes violence. With their own ways of managing alterity, these historically rooted relationships might be instructive for those seeking to assuage tensions today. Sundering them, while it may create the social space into which various NGOs, experts, and advocates can enter and “save” or “reform” them, occurs at many social costs.

Figure 7.7 Toward a frontal opposition between “indigenous” and “local”



The generous and principled attitude based upon the wish/will to include “rainforest peoples” in the conservation process on terms that accord them rights and respect (e.g. Sheil and Lawrence 2004) is also playing into emerging political identities that may contrast categories such as “indigenous” and “local.” Further, the impassioned but imperfect initiatives underway to decentralize forest management and improve environmental governance through the devolution to “communities” or “villages” of forestry or hunting practices merit careful attention. For they can inadvertently constrain or circumscribe complex groups with multiple affiliations to clan, trading partners, patrons, and place to acting as a kind of unitary partner or actor in neoliberal international economies of forest use. Community members, conservationists, policy makers, politicians and those in the private sector deserve—and many desire—a body of engaged scholarship that can assist them in critically assessing the consequences, intended and unintended, of their interventions in the closing frontiers of the Congo basin.

As such “conservation where people live and work” (Miller & Hobbs 2002) is crying out to be better studied in Central Africa. In the Congo Basin what will be the impacts of such trends on such flexible economies of socially mediated and physically mobile access to forest resources? Regionally rooted social relations of exchange have persisted through the brutal colonial past and through the challenging postcolonial period.

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State-Making and Transnational Process: Transboundary Flows of Resources in a Borderland of Western Borneo

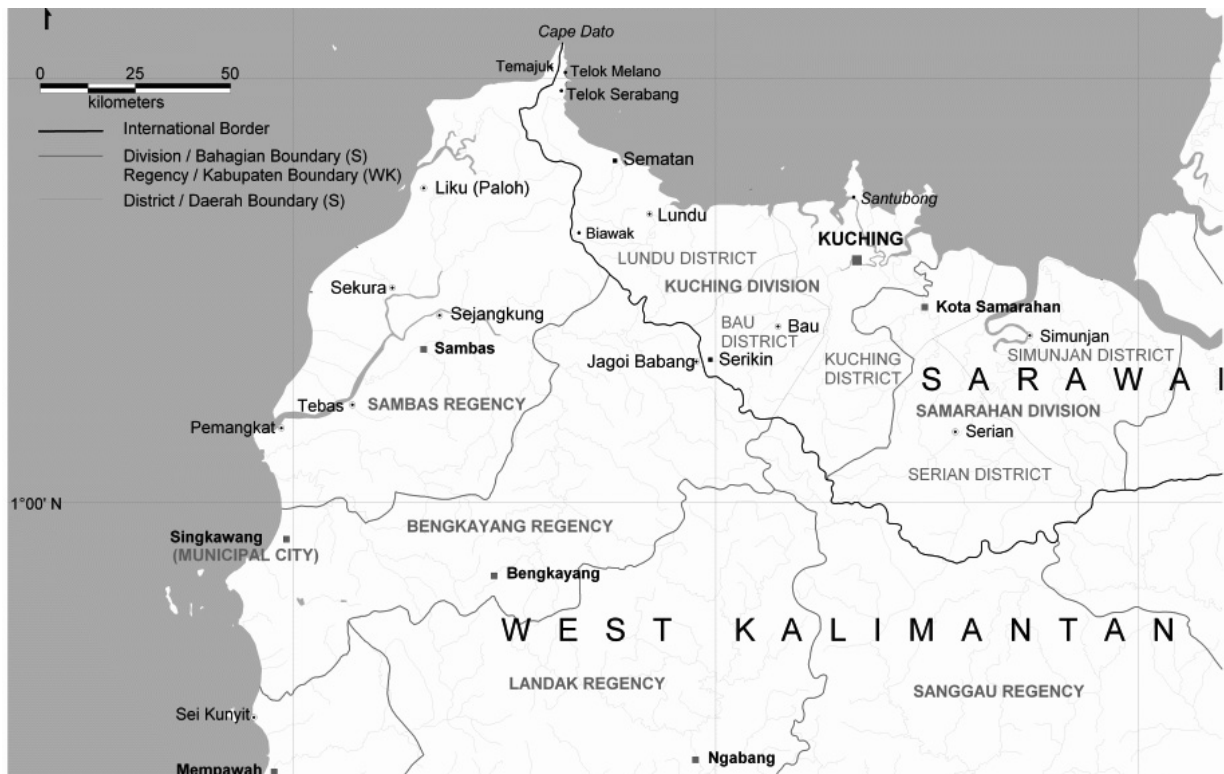
Noboru Ishikawa

Abstract: This paper scrutinizes the relationship between state-making and transnationalism with special attention to the flows of human and natural resources and agricultural commodities at the margin of the state. Are boundary-making and transnationalism oppositional in the process of state-making and is the relation between the two zero-sum? Are national space and transborder social flows antagonistic in nature? Or can we suppose the nation-state and transnationalism are mutually constitutive rather than exclusive? To provide answers to such inquiries, this paper looks at simultaneous process of construction and deconstruction of national boundary in the Sarawak/Kalimantan borderlands of western Borneo from the 1870s to the present. The mobility of people and commodities demonstrates organizational forms of governmentality as well as structural forces of capitalism, reflected in flows of natural and social resources channeled and regulated over time and across space. Simultaneously looking at separation and linkage as well as severance and articulation at the interstices between nation-states, the paper focuses on the long-term historical process where parochial transnationalism inherent in Bornean border societies has been transformed and endowed with new forms and functions under the territorial states, placing the transnational flows of resources both in a larger matrix of mercantile and industrial expansion in maritime Southeast Asia.

8.1 National Space and Frontier

The Anglo-Dutch Treaty of 1824 began to transform the fuzzy and unbounded geo-bodies of Southeast Asia into the bounded territories of two European empires. The transfer of Bencoolen in Sumatra to the Dutch and Malacca on the Malay Peninsula to the English divided maritime Southeast Asia into two domains: one north and one south of Singapore. This division was useful in settling claims in Sumatra and Malaya, but it was of little use on the island of Borneo, where the frontier between local sultanates was more important in forming the boundary between colonial empires. In coastal western Borneo, parallel to Singapore across the South China Sea, the frontier between the Sambas and Brunei sultanates was based on the natural watershed of a central mountain ridge. In the process of colonial division that followed 1824, the interface between British and Dutch territory in this region long remained a fuzzy political buffer zone. It was in this border zone that a British ex-officer of the East India Company established his own kingdom in 1841.

The region under analysis has always been a social interface between sets of political systems: from the pre-colonial world of the Brunei and Sambas sultanates, through the colonial realms of white rajahs and British and Dutch governments, to the post-colonial era of independent Malaysia and Indonesia. Over time it has changed from a mercantile crossroads in a Malay maritime world to an obscure periphery of a modern national territory. Lundu District, 722 square miles of the western corner of the First Division was one of the oldest administrative districts under Brooke colonization, sitting at an extremely porous international boundary with Netherlands East India. The borderland area was divided by the low mountain ridge running from Cape Dato on the coast to Mt. Raya in the interior. On the Sarawak side, the Lundu, Tuba, and Serikin rivers run into the South China Sea. On the Dutch side, the Sambas, Landak, and Sparan rivers run down to the plain. Marked only by this watershed, the boundary between the Brooke territory of Sarawak and Dutch Sambas originated in and coincided with the symbolic frontier between the Brunei and Sambas sultanates (Map 8.1).



Map 8.1 Sarawak and West Kalimantan, and the locations referred to in the chapter

In 1841 the district was incorporated into Sarawak when it was granted to James Brooke by the sultan of Brunei. The district was a relatively unproblematic colonial territory compared to the Second Division, where Iban resistance was constant. The first fort was established here in the early 1870s where it functioned as a training station for young British officers in their first years of duty from whence they transferred to further outstations. The development of the plantation industry in Lundu was also encouraged by the rapid growth of the Singapore commodity market during the latter half of the nineteenth century. The 1869 opening of the Suez Canal significantly boosted worldwide trade and the value of Singapore's trade increased by 154 percent in five years¹. Tanjong Dato, at the western tip of Lundu District, was located in the heart of the trading network that linked Singapore, the west coast of Dutch Borneo, Sarawak, and Brunei.

8.2 The Development of Lundu's Plantation Economy

Lundu's plantation economy was based on different modes of crop production employed by the Chinese, Dayak and Malay residents. Chinese plantations were operated by wealthy merchants from Singapore, Pontianak and Kuching who employed coolies from Dutch Borneo. Dayak cultivation was family managed, with labor rarely involving more than a longhouse or group of kinsmen. Malay plantations were opened by Malay merchants from Sambas and other coastal areas in Dutch Borneo, under the leadership of Malay and Bugis ship captains (*nakoda*) turned merchants. Except for a small number of Dayak and Malay laborers employed at Chinese-owned fields (*SG*,² November 1, 1893:173, Lockard and Graham 1992:28), Lundu plantation industry was based on this ethnically segmented labor organization.

1. From \$58,250,915 in 1868 to \$89,632,235 in 1873.

2. *SG*: Sarawak Gazette; *SG-LDMR*: Lundu District Monthly Report, Sarawak Gazette; *LDR*: Lundu District Report.

Chinese Taukay-owned Pepper and Gambier Plantations

According to the census of 1889, the Chinese population in Lundu was 947, with a male/female ratio of 5:1. Most of these were indentured laborers from western Dutch Borneo working on pepper and gambier plantations. Chinese planters, taking advantage of the special incentives offered by the Sarawak government, cultivated cash crops “by living on the premise or put[ting] coolies in charge” (SG, August 1, 1899:261).

The terms “plantation,” “garden,” and “estate” were used interchangeably in Lundu District reports to describe Chinese-owned cultivated fields. The size of the fields and the number of laborers employed varied significantly. Pepper-gambier gardens recorded in 1893 ranged from 3 to 8 hectares.

Those containing less than 200 pepper vines could probably have been managed as smallholdings. Gardens with more than 1,000 vines would have demanded a labor force well beyond that of a household, especially in harvest season. The *Sarawak Gazette* reported that in Sematan district, gardens “...with over 100 vines numbered 37. The number of vines on the said plantations amount to 50,250, and the aggregate number of labourers employed on the same appear to be 81 males” (SG, July 1, 1893:114). A Pontianak Chinese was recorded to have employed 28 coolies and cleared 600 acres for a coffee plantation, one of the largest in the district (SG, April 1, 1895:66-67).

The larger plantations under the management of wealthy taukay merchants with various holdings were often described as “firms” or even as “kongsi,”³ independent units patterned after their clan-based organizations in China (SG, April 1, 1895:66). Large plantations had on-site clerks for daily operations and were equipped with accommodation facilities for coolies (SG, April 1, 1895:67).

Table 8.1 Population in Lundu District 1889/1898 (SG August 1, 1898:166).

Ethnic Group	Male	Female	Total 1898	Total 1889	+/-
Chinese	629	168	798	947	-150
Malays	737	659	1,396	1,023	373
Sibuyau	429	436	865	844	21
Silakow	366	333	699	804	-105
Larah	135	120	255	333	-78
various	61	66	127	149	-22

The Chinese cultivation system was exploitative in nature. But securing revenue from taxes levied on export commodities was the government’s priority. It therefore focused on ensuring the smooth operation of Chinese plantations, even if this hampered efforts by laborers to circumvent exploitation by *taukeys*. This is best seen in the distribution of agricultural produce in local markets, an issue of major concern to Chinese plantation owners. Not a small number of coolies secretly sold crops to Chinese merchants outside the Lundu bazaar rather than to their own employers (SG, June 1, 1889:78).

Nakoda Entrepreneurs and Malay Coconut Plantations

Malay commercial activities on the coast of Lundu District were part of the development of a larger trading network in the region encompassing the east coast of Riau, Singapore, the Natunas, Sarawak, and West Dutch Borneo ports such as Sambas, Mempawah, and Pontianak. The coastal area between Lundu and Tanjong Dato was directly linked to commercial hubs in Java and Singapore by the trading network of Sambas and Bugis *nakoda* merchants.

Even after James Brooke came to power, Malay trading activities survived for a time linking Pontianak and Brunei via Tanjong Dato, with Sematan and Lundu port functioning as important strategic points connecting West Dutch Borneo and Sarawak. From the mid-19th century, *nakoda* trading activity accelerated in response to rising demand

3. For a discussion of *kongsi*, see Daniel Chew (1990).

for timber in Singapore's market, and *nakodas* engaged in the timber business in the Lundu coastal district, employing Sambas men as coolies and carpenters. In the early 1890s, *Sarawak Gazette* recorded substantial contact between *nakodas* and Lundu officials regarding timber and ship-building businesses: *nakodas* asked for monopolies on certain types of timber (especially tengar bark and pinaga wood) and jungle produce; the Brooke government ordered them to pay export duty on each shipment to Singapore and Java; and Sambas Malays were ordered to pay tax on each *sampán* (boat) they built (*SG*, February 1, 1893:26, September 1, 1893:146, December 1, 1894:208, April 2, 1894:56, August 1, 1895:144, December 2, 1895:220). Logging activities by *nakodas* on the coast between Lundu and Tanjong Dato, as well as on major river lines such as Kuala Lundu, Kuala Sematan, and Kuala Samunsam, facilitated the later development of coconut plantations in the area.

Since the cultivated interior of Lundu and Sematan had already been exploited by Chinese pepper planters, there was little room for *nakoda* traders to open up new pepper estates when they turned to agricultural production. At the same time, pepper prices on the international market had collapsed, making it less attractive. But Sambas *nakodas* (Malay and possibly Bugis merchants), long engaged in coconut planting in coastal districts of western Dutch Borneo, had the necessary expertise to open coconut plantations. Copra, the resulting commodity, was a low profile export that experienced no dramatic price increases on the international market. Compared to pepper, copra was insignificant to Sarawak's international trade returns, but had been a stable income source for coastal populations. These factors led to the formation of a coconut plantation belt on the frontier coast near Tanjong Dato that encouraged Malay migration from the Sambas area to the coast between Lundu and Tanjong Dato in the 1890s.

Opening a new coconut plantation along the previously uninhabited coast required the clearing of virgin forest. Intensive labor was also needed for planting seeds, daily maintenance of estates—especially weeding *lalang*—harvesting, husking, and drying seeds for copra production. *Nakoda* plantation owners therefore brought Malays across the Sarawak/Dutch Borneo border to act as on-site estate caretakers and laborers, providing their workers with staple food for their settling-in period. They also brought a range of fellow community members, including children and grandchildren, traditional medicine men (*bomoh*), midwives (*bidan*), and carpenters (*tukang*). The bond between early settlers and *nakodas* is characterized as a patron-client relationship.

Plantations and *kampung* (villages) were on virtually the same spot, a characteristic of the Malay mode of production in the region. Plantations of greatly varying sizes aggregated at river mouths or sandy beaches such as Bakuching, Belingsah, Bedaun, Sungei Limo, Kuala Samunsam, Telok Serabang, and Telok Melano. Colonial officers reported that “the whole coast from S. Blinsah to Telok Milano has now been practically taken up for cocoanut planting” (*SG*, July 1, 1898:142).

Village organization in the plantation belt gradually took shape from loosely structured aggregates of several coconut plantations to an administratively independent community with a village head. By 1899, six *kampung* were established with officially appointed *tua kampung* (village heads) and a *penghulu* (district head): Belingsah, Bedaun, Sungei Cina, Simunsam, Serabang, and Telok Melano. By the end of the nineteenth century, *nakodas* from Dutch Borneo were fully incorporated into Sarawak's government-backed plantation economy. Malays had maintained their community-based labor organization under the leadership of *nakodas* and migrated to open new plantations which became their home villages.

8.3 Frontier Expansion and Forest Resource in the 1880s

What happened to the flows and movements of people and goods when the colonial state tried to inscribe a linear territorial boundary upon a zonal frontier between Sambas and Brueni sultanates? The experience of the borderland in Lundu District shows us distinctive developmental phases of a transnational space from the 1880s to the present, that is, the frontier expansion and the commercialization of forest resource in the 1880s, the contraband trade of rubber in the 1930s, and newly channeled commodity flows for industrial expansion since the 1990s.

Jagoi Dayak and Transborder Swidden Practice

During the early period of development of Lundu District, one of the first recorded border disputes between Sarawak and Dutch Borneo in western Borneo occurred over the affiliation of the Dayaks who engaged in swidden cultivation in the border area. Both governments claimed as their subjects the Jagois (a group of Land Dayak residing in upper

Sarawak) and thus the right to collect their head tax. As early as 1874, the Committee of Administration of Sarawak and the Dutch authority discussed the matter of border crossing by Jagoi Dayak (SG May 16, 1874:n.p.) and the demarcation of the Sarawak-Sambas boundary (SG July 24, 1874:n.p.). The affiliation and farming practices of the migratory Jagoi population remained unresolved and was discussed into the 1930s, involving high-level officials in both Kuching and Pontianak, the respective capital cities.

From the beginning of Brooke rule, claiming subjects was crucial, even in the sparsely populated mountain region of southwestern Sarawak, because the head tax contributed substantially to district revenue. In 1892, for example, the Dayak head tax constituted 39.37 percent of the total of revenue for Lundu district, followed by court fees and fines (34.66 percent), the exemption tax (17.13 percent), licenses (4.6 percent) and assessments (4.2 percent) (SG May 1, 1893:78). Interestingly, neither the national affiliation per se nor the permanent presence of these swidden cultivators was a critical issue for either government. As long as head tax was paid, mobile Dayaks were allowed to engage in shifting cultivation in both Sarawak and Dutch Borneo (SG April 1, 1935:51).

Apart from the payment of head tax, authorities were indifferent to Dayak mobility because they were not important to the commercial estates where control of labor was indispensable. For those workers, Chinese and Malay agriculturists working on commodity production such as pepper and gambir, state surveillance took different forms. In the plantation belt between Lundu and Cape Dato, as securing and mobilizing a labor force became more important, control over the national affiliation of agricultural laborers became ever tighter.⁴

Under the Brooke government, the traditional tributary system was replaced by import and export duties. This transformation required two distinct processes. The first was the commodification of natural and agricultural resources. Whether jungle or cultivated produce, goods had to pass through the mechanism of market exchange. Second, for taxation to be levied on the import and export of goods—the government’s ultimate aim in the promotion of cash crop production—articles of merchandise moved spatially between the territories of modern states. The inter-colonial border, an imaginary construct to begin with, thus came to have real meaning in the flows of commodities.

Timber and Jungle Produce

During the initial period of Brooke colonization, timber and jungle produce were the focus of management. The commodification and taxation of natural resources only became possible with the formation of colonial governments on both sides of the Sarawak-Dutch Borneo border; the national affiliation of things in Sarawak proceeded after all unoccupied land was declared a national possession in 1871. Because jungle produce such as damar, jelutong, beeswax, gutta-percha and camphor, commanded high prices on the Singapore market, Sarawakians collected them as far inland as Dutch Sambas. In 1876, in response to a complaint from the Sambas Sultan, Charles Brooke issued an order discouraging border crossing to gather jungle products. The order alerted Sarawak residents that the Sultan would demand “a payment of ten per cent on primitive produce... before such produce can be taken out of his country” (SG June 5, 1876:3). But even into the 1890s, when a monopoly on jungle produce collection in Sambas district had been granted to a Mr. T.W. Kaat of Java, the exploitation of forest resources by Sarawak subjects there had not ceased, occasioning further complaint and notice of prohibition from that government (SG October 10, 1890:125).

Natural resources within Sarawak’s claimed territory were similarly attractive to outsiders and gave the state an opportunity to level taxes. Because of its proximity to Singapore and such regional commercial centers in Dutch Borneo as Pontianak, Mempawah, and Sambas, the coastal area of Lundu District was frequented by non-Sarawakian *nakoda* traders who came to cut timber and build *sampan* boats. The Lundu authority reported enforcing the regulation that “[n]o strangers are... permitted to work timber without first obtaining a permit at the Court House,” and in at least one case, “in lieu of taxation [collected] one boat out of ten...” (SG February 1, 1893:26). In other cases, government officials were able to collect the tax in cash (SG April. 2, 1894:56; SG August 1, 1895:144). At least some evidence appears that government officials succeeded in instilling the mindset of territoriality, as when “Haji Matsalli, a Sambas Malay, asked and received permission to work tingar bark with 13 companies, and export the same to Java” (SG August 1, 1895:144).

Charles Brooke ordered his officials in Lundu to open up forest in Sematan to facilitate timber work by anyone

4. For the detailed description and analysis of the emergence of an ethnically segmented labor market and pepper, gambir, and coconut plantations in Lundu district, see Ishikawa (forthcoming).

wishing to do it (SG December 1, 1894:208). Consequently, officials at the Lundu District Office were kept busy collecting export duties as the volume of exports from Lundu and the Sematan coast increased. They kept an eye on incoming and outgoing vessels to ensure the legal traffic of goods and devised ways to improve their surveillance (SG September 1, 1900:175).

As the timber market expanded in Singapore and Java in the latter half of the century, a substantial number of traders cut timber on the coast. These exploiters of forest resources were not regarded as foreign intruders. Instead, the outsiders were welcomed as long as they paid duties on the timber they exported. The Brooke's colonial management of commodity flows drastically transformed its nature with the advent of rubber production to western Borneo, which subsequently led to the emergence of primordial form of national economic space at the margin of colonies, both Dutch and Sarawakian.

8.4 Rubber Smuggling: Transnational Mercantilism in the 1930s

The transborder swidden agriculture by the Jagoi Dayaks and exploitation of forest resources by the Sambas Malays became the subject of the state control from the 1880s to the 1920s, the period corresponding to the frontier expansion of Sarawak under the second Rajah Charles Brooke. With the demarcation of colonial boundary between Sarawak Kingdom and the Dutch West Borneo, the utilization as well as exploitation of forest resource by "the Sambas subject" across the border became an issue at stake for the government revenue generation. In terms of scale of the operation and the complexity of the organizational arrangement involved, rubber smuggling from Dutch West Borneo to Sarawak in the 1930s greatly differs from the previous mode of transnational flows and movements.

The advent of rubber cultivation in western Borneo marked a new era for the borderland, tying the periphery of the European colonial empire directly to the international rubber market. The 1920s was the turning point, as the focus of commodity production shifted from timber, pepper, gambir, and coconut to rubber. Demand for rubber rose as the supply was restricted through the Stevenson Scheme (1922-28) and the temporary price recovery peaked in 1925 before declining toward the end of the decade. Thereafter, the Great Depression resulted in a prolonged slump of the market and further intervention by the government in rubber production and export.

The International Rubber Agreement (INRA) of 1934 was invoked by rubber-producing colonies in the tropics in order to maintain market price after the Great Depression. Under the terms of INRA, all new planting was forbidden and state-wide "Tapping Holidays" were declared every fourth month. Regulation of cultivation and export through a national quota system resulted in tighter control of the cross-border movement of dutiable rubber sheets. As a result, some hinterland peasants abandoned rubber and replanted coconut and pepper vines, but also the transnational smuggling of rubber from western Dutch Borneo to Sarawak began to flourish. For instance, some Lundu peasants began to replant coconut and pepper because of the embargo on rubber planting, but also because of the success of other coconut gardens on the coast (SG October 1, 1936:242).

Other peasants turned to smuggling of commodities from Dutch Borneo and their sale to Chinese *taukay* shops in Sarawak. By the 1930s Lundu District as a whole had been incorporated into the state-led commodity production system, and transnational networks were swiftly established on a corresponding scale to evade tightened border controls. The smuggling of rubber and other dutiable commodities between western Dutch Borneo and Sarawak reflect response of hinterland peasants and merchants in western Borneo to both the limitations and opportunities presented by production quotas. In addition, however, rubber cultivation in western Dutch Borneo had started earlier than in Sarawak and produced considerably more. In the late 1930s, when rubber smuggling into Sarawak was at its peak, western Borneo accounted for as much as 15 percent of the NEI's total rubber acreage excluding Java (Aikawa 1944:188). In Sambas rubber production was carried out mainly by Malay peasants along the major rivers and by interior Dayaks located along the border.

The smugglers profit represented a loss in government revenue. In Lundu District from the mid-1930s, it became an important task for officers to arrest and punish those engaged in the illegal transaction of rubber and coupons (SG April 1, 1936:86; SG May 1, 1936:107).

The development of a smuggling economy coincided with the socio-economic development of a national as well as supra-national order. In fact, it can be argued that the Sarawak colony became recognized as a full-fledged territorial state precisely with its incorporation into the world-wide rubber production system and especially the rubber restric-

tion schemes. Its participation in rubber restriction gave Sarawak internationally recognized status as an independent economic unit required to control the production and distribution of an important commodity within its territory. Over the course of the 1950s and early 1960s, the economy of Lundu became dependent on the smuggling industry. With the Kuching-based distribution network far away, bazaars in the frontier district obtained Indonesian goods from smugglers and redistributed them to the local merchandizing network. Many peasant communities adjacent to the border gave up planting any commercial crops and chose the more profitable smuggling business (*LDR* 2nd Half Year 1959).

The hinterland of Lundu District adjacent to the border remained in curious isolation at the periphery of the colonial space during the heyday of smuggling. In responding to imperial networking within and beyond state territory, local communities on both sides of the border established socio-economic symbiosis through the transnational flow of people and goods. These transnational chains were suddenly broken, however, when the Republic of Indonesia and the newly-formed Federation of Malaysia engaged in geo-political rivalry from 1963. The borderland was then transformed into a politically charged new frontier where a series of violent events directly related to international politics occurred—first military confrontation between Indonesia and Malaysia, known as *Konfrontasi*, then guerilla activities by communist cells in the jungle adjacent to the border.

8.5 Osmotic Pressure between Malaysia and Indonesia since the 1990s

From Jalan Tikus to Jalan Gajah

The widening economic gap between Indonesia and Malaysia has accelerated movements of natural resources and agricultural commodities from Indonesian Kalimantan to East Malaysia. In response, the two countries have studded the international border with official immigration posts and customs houses that eventually give further impetus to official flows of traded goods and documented laborers. The Cross Border Agreement of 1984 proposed the opening of ten points of entry and exit (*Pos Lintas Batas*) along the Kalimantan-East Malaysia border: Paloh, Sanjingan, Sungai Aruk, Saparan, Jagoi Babang, Sidding, Bantan, Merakai Panjang, Nanga Badau, and Entikong. On October 1, 1989, the completion of the first sealed road linked Kuching with Pontianak via the border towns of Tebedu (Sarawak) and Entikong (West Kalimantan), creating a new entry/exit point where border trade increased by leaps and bounds. Between 1988 and 1990, customs revenue jumped sharply on a volume of trade that increased 679 percent from previous decades (SDI 2001: 12).

As hubs for local crossborder traffic are transformed into official entry/exit points under the statistical supervision of postcolonial nation-states, the small paths traditionally called *jalan tikus* (rat roads) are replaced by larger roads that facilitate greater traffic. Some of the paths through which raw rubber sheets were illicitly brought to Sarawak during rubber boom have been upgraded to the major pipelines connecting state capitals of Pontianak and Kuching. As a local newspaper put the matter, traditional *jalan tikus* became *jalan gajah* (elephant roads) connecting border towns to the capital cities of Pontianak and Kuching and other major towns in Kalimantan and East Malaysia.

The border-crossing inspection post of Entikong functions as a crucial commercial hub between the two countries. The development of Entikong-Tebedu trade has provided more economic profit to West Kalimantan than to Sarawak. In 1998 the trade surplus reached three million US dollars due to the depreciation of the Indonesian rupiah. For instance, the rise in crossborder trade of traditional agricultural commodities increased from 25 percent in 1996 to 40 percent in 1998. The rise in export values of black pepper and cocoa increased significantly from four and eight percent in 1996 to 29 and 22 percent in 1998 respectively (SDI 2001). And actual export values could be much higher than recorded values due to the impossibility of recording all traditional trade activities undertaken along the border.

Many traders I talked to at Entikong depended upon the continuation of a weak Indonesian rupiah. The outflow of commodities from Indonesian territory, both documented and undocumented, will continue as long as a much-depreciated Indonesian rupiah renders a profit to locals who are marginalized from the Pontianak-based commercial network. The opening of the Entikong Post did not eliminate illicit cross-border trade. The most common smuggled goods are cigarettes, rice, bird's nests, clothing, household items, and hewn timber. The illicit trade is tolerated, although the transboundary trade of timber reduces local capacity to sustain economic development. In fact, a substantial number of wood processing industry in West Kalimantan has already run out of timber, causing its workers to be laid off.

The downturn of the Indonesian economy during the last phase of President Soeharto's leadership was regarded as

favorable by the Indonesians at the margin of the national territory. Their weak economy meant a stronger Malaysian ringgit—to which they had peculiar access as residents of the borderland. Saving capital in ringgit was safer and more profitable for many of borderland villagers of West Kalimantan, because the longer they kept capital in the form of a foreign currency, the higher its monetary value became. In this sense, Indonesians migrating to the national periphery adjacent to the border transgress the spatial limitations of a national economy as determined by the compulsory use of a single currency within the national territory. Many villagers explicitly expressed the hope that the Indonesian economy would continue to decline to preserve the value of their ringgit savings and earnings against their own currency.

National Currencies on the Border

Not only traders engaged in commercial activities at frontier marketplaces, but also peasants at the margin of the national territory are well aware of the monetary difference. The dramatic depreciation of rupiah after the economic crisis transformed the life of cultivators of commercial crops, especially pepper. From Telok Melano, a Malaysian village adjacent to Sarawak/West Kalimantan border in the Cape Dato, a walk of approximately 30 minutes along a small path through cultivated fields, secondary jungle, and barren grassland takes us to another border village of Temajuk, straddled by pepper fields stretching out into both national territories. The words “Selamat Datang di Indonesia” (Welcome to Indonesia) painted on a simple wooden gate are the only indication of the presence of an international boundary, as the border crossing lacks an immigration office and police checkpoint. When I visited Temajuk in 2002, I found that the villagers had made a substantial profit from trading their pepper seeds to Malaysian middlemen from Telok Melano, a Malaysian village across the international boundary.

8.6 Mobilization of Indonesian Labor

In addition to the cross-border movements of agricultural products and natural resources into Malaysia, the mobilization of labor has become more crucial than ever for Malaysian industries and for peripheral Indonesian peasant communities structurally drawn into Sarawak’s production system. Lying on the geographical periphery of the Republic of Indonesia, West Kalimantan has become part of the economic infrastructure of Sarawak and its flow of human labor is indispensable for the development of Sarawak’s economy. So-called “3 D” jobs (dirty, difficult, and dangerous) are filled by Indonesian migrant workers in sawmills, at construction sites, and on palm oil plantations. Female labor is also found in households and restaurants in East Malaysia.

People from Sambas regency have long worked in the timber industries. Out-migration began in the 1950s and increased in the mid-1970s after the military presence put a halt to contraband rubber trading across the border. Domestic labor migration to other parts of West Kalimantan first went to logging areas near Pontianak and Ketapang. The people of Sambas have since become well known for their proficiency at the felling and hauling techniques required by the logging industry. During the 1970s, labor migration to Sarawak was common, largely oriented towards logging sites and Federal Land Development Authority (FELDA) oil palm plantations. Moreover, local logging companies recruited Sambas Malays for operations in Riau, Sumatra.⁵ In this decade and one that followed, migrant labor from Sambas was still largely adult males, but female workers began to work outside Sambas during the 1990s. At present, the destination of labor migrants has expanded to include plywood factories and sawmills in Kuching, Sibul, Bintulu, and Miri. Along with Javanese contract workers from east and central Java, Sambas Malay workers constitute the majority of the work force in these workplaces.

According to a labor agency based in Sambas which regularly sends local Malays to Sarawak’s timber companies, the number of Indonesian laborers (Tenaga Kerja Indonesia, TKI) sent to Malaysia peaked between 1990 and 1995, when an average of 700 workers per month were mobilized from Sambas. Even after the Asian economic crisis set in, the agency still managed to send 120-130 workers monthly from Sambas in 1997. In 2003, 150-200 laborers were sent per month.

Labor recruitment agents usually come directly to villages in Sambas and offer candidates a choice of companies

5. The Federal Land Development Authority is Malaysia’s largest palm oil producer, and indeed the world’s largest. Originally created in 1956 to channel financial assistance to state governments for land development programs, FELDA’s role was later expanded to include the task of implementing land development programs throughout the country.

and of destinations. Male applicants must pay Rp. 600,000 in advance (in 2000), a sum that covers Malaysian work permits and transportation. The costs of preparing the required documents to obtain a passport, birth certificate, family certificate (*Kartu Keluarga*), and passport photo are extra. Male workers have to obtain their own passports, while work permits are arranged by the agencies. For female workers, the cost of passport fees and other necessary documents (RM 300) is paid by the agencies and deducted six months later from their salaries.ⁿ

The labor migration of the Indonesians across the international boundary is indispensable to the development of the economy of Sarawak, and as a result, deterritorialized borderlands have emerged everywhere – on assembly lines of plywood manufacturers, in oil palm plantation fields, and in kitchens of middle class families, where Malaysians employers and the Indonesian workers, especially Foochow entrepreneurs and Sambas Malays from the border region of West Kalimantan, work side by side. Not only labor, but also agricultural commodities and natural resources have flown into the Malaysian market. The agricultural frontier under the Brooke white rajahs has become an industrial frontier, and resourceful Indonesians has contributed to its formation.

Since the Asian economic crisis of 1997, the economic gap between Indonesia and Malaysia has widened, and the weak rupiah has been a prime factor in generating massive flows of national resources out of Indonesia. When out-migration is tolerated by the state and local institutions emerge to support it, a nation's people become a labor reserve for foreign production systems. And when the transnational movement of agricultural commodities and natural resources is also incorporated into the system across the border, the expansion of capitalist production never comes to an end.

With the development of commodity markets and timber-related industries in Sarawak, outflows of labor became an integral part of the rural societies of West Kalimantan. Sawmills, plywood manufacturers, and oil palm estates are heavily dependent on Indonesian labor recruited from the region's peasant communities, and the flow has been accelerated by the opening of official immigration posts and the construction of road networks directly connecting local villages with Sarawak's main economic hubs of Kuching, Sibul, Bintulu, and Miri.

8.7 National Boundary and Power

The transnational mobilization for production is an important element in social dynamics on both the local and supra-local level. Malay *nakoda* traders and Chinese *taukay* entrepreneurs transformed the frontier of colonial Sarawak into plantations by bringing in foreign laborers. A century later, Malaysian timber and plantation industries are employing labor from the Sambas region of West Kalimantan and other parts of Indonesia. Although the mode of labor deployment and the organizations and institutions involved vary from time to time, the direction of labor movement is the same. Sarawak has been always a frontier land. It is now undergoing a transformation from an agricultural to an industrial frontier.

From the time when J.H. Boeke (1953) developed his notion of a dual economy, Indonesia has been a primal case where two separate economic systems have coexisted, one geared to local subsistence needs and the other to wage labor. The Dutch deliberately divided Indonesian rural society into two labor sectors, one for subsistence-oriented agriculture and the other for plantation-based commodity production. The Indonesian state does little to limit the movement of people and goods. The current movement of undocumented resource and labor along numerous *jalang tikus* are a modern manifestation of older transnational commodity and labor flows between Indonesia and neighboring countries. Under the current international division of labor, the colonial element in the production of agricultural commodities has been replaced by foreign capital. Production sites are located abroad, while rural agricultural communities generate and maintain steady outflows of labor.

To examine the borderlands of western Borneo as a field of dynamic tension where labor is mobilized, deployed, and organized for production, it is useful to use a set of conceptual tools, namely the *organizational power* exercised in the state's spatial encroachment and consolidation, and the much larger *structural power* organizing and orchestrating the various operating units for organizational power at work (cf. Wolf 2001: 383-397). The borderland of western Borneo is a point of articulation between the two forces; one is responsible for the formation of markets both for commodity and labor, where organizational power is brought into play and the other for the capitalist expansion that links the periphery of maritime Southeast Asia with larger economic forces.

Organizational power is concerned with how individuals are deployed and social fields arranged for production. The classic *plural society* was a colonial case of the exercise of this power, where multiple ethnic groups became en-

meshed in the system of colonial production. In colonial Malaya, for example, Chinese labor was typically mobilized for tin mining, and Indian labor for rubber plantations. Operating units such as mine sites and plantations growing rubber, tobacco, pepper, and gambir, as observed in the borderland of Lundu District, were supported by colonial policies, and labor was controlled by plantation owners, entrepreneurs, labor recruiters, and colonial officials. Everyday supervision of work, the sale of produce, eating, drinking alcohol, and even gambling are examples of how operating units circumscribe the actions of others. This kind of organizational force is also at work in the current economic regime where flexible accumulation of capital and transnational labor mobilization are underway. The “off-shore” labor market in the present, as well as agricultural fields in the colonial past, have been the niches where organizational power operates. The arena of the operation is varied; from coconut plantations, to plywood factories, and to the territorial state at large.

Structural power emerges when the changing form of capitalism engages local social formation, and it creates the operating units for organizational power, which is closely related to the emergence and transformation of community, labor and commodity market, and territoriality of the state itself in the case of the borderlands under analysis. Larger forces such as colonialism, internationalism, transnationalism, and globalization all structure political economy and labor processes on the ground. This mode of power “not only operates within settings or domains but also organizes and orchestrates the settings themselves, and that specifies the distribution and direction of energy flows” (Wolf 2001:384).

The border zone of western Borneo serves as a useful window to see how the nation-state becomes a territorial as well as a trans-territorial entity under both organizational and structural power. The making of national space by the Brooke government begun with the alchemy of land administration. A series of laws made land previously under the jurisdiction of Brunei Sultan as well as local Dayak chiefs *terrae nullius*, unoccupied land. Under the second rajah, all unoccupied land, now the property of the government, became available to “Sarawak subjects” for commercial production, but reverted to the state if left uncultivated. With the state directing the energy of the people into the cultivation of commodities, Chinese and Malay workers, under the leadership of *taukay* and *nakoda* entrepreneurs respectively, were allowed to enter Sarawak, leading to the formation of an ethnically segmented colonial society adjacent to western Dutch Borneo territory. These arrangements created numerous operating units for organizational power, within which two distinctive modes of social grouping were observable: the formation of Chinese *taukay*-owned estates and Malay communities with continuous transboundary inflows of Chinese laborers and Sambas Malay laborer-cum-settlers. The way these flows of labor were handled differed from one ethnic group to another, as the analysis of the formation of Malay and Chinese communities above showed.

Once the production system became operational, the government attempted to make sure that the laborers and community members stayed within the colonial space, and that commodities produced there generated tax revenues when traded across the territorial boundary. To clarify and confirm the affiliation of labor and of agricultural or forest commodities, Sarawak authorities created a series of ordinances regulating the movement of people and dutiable commodities. The regulations covered compulsory possession of passports, the arrest and extradition of criminals who crossed the border, the pursuit and arrest of runaway coolies, a prohibition of border-crossing during pandemic outbreaks, control of the opium trade, a prohibition against cross-border swidden cultivation, and registration of cultivated land. Another series of regulations dealt with naturalization, marriage registration, the prohibition of bigamy by non-Sarawak subjects, and spousal support and child rearing with intention to make mobile locals sedentary.

The advent of rubber changed the way people on both sides of the border interrelated. The operating units where both organizational and structural forces were at work became transnational as well as global. Under the International Rubber Agreement of 1934, the Dutch and British imperial delineation disrupted quotidian trade ties over the border. The implementation of this agreement was epoch-making because it linked the international market to rubber merchants and smugglers in the borderlands of western Borneo, with the latter exploiting cross-border trading to increase profits. The imperial cooperation, peculiar to the interwar period of internationalism in the 1930s, resulted in the formation of a new social field where local agency utilized micro transnationalism at the national margin.

A crucial change in the nature of transnational flows in the borderlands of west Borneo took place in the late 1980s, when the labor force on the Indonesian side became the subject of deployment by the Sarawakian industries. Uninterrupted transnational flows of labor require systematic organization of recruitment, immigration, and transportation. Once plywood production got underway, a regular supply of labor from Sambas in West Kalimantan was necessary for

the factories, which operate 24 hours a day and 365 days a year. With the establishment of an Indonesian labor market for timber-related industries and agro-plantations in Sarawak, Indonesian border society in Kalimantan became part of the infrastructure underlying East Malaysia's industrial expansion.

The contemporary transboundary flows of labor, capital, and technology are an articulation of organizational and structural power. The state's apparatus for establishing new niches for labor and resource mobilization is now deeply tied to global arrangements for new kinds of industrial production such as palm oil for biofuel and *Acacia mangium* for pulp. The transnationalism being formulated by Malaysia and Indonesia requires deliberate state action to systematize cross-border flows of labor and resource with the participation of a wide range of private entrepreneurs and public sectors.

8.8 National Space and Transnationalism

The sanctioned neglect of the importance of a spatial understanding of history has been a prime motive of my study. The chapter has undertaken an examination of the general process at work in the borderlands of western Borneo; mercantile and capitalist development, relationships between the national and the transnational, location work of border society and the state. What are implications of national boundary making for the transnational allocation of resources? How have exercises of power, both organizational and structural, shaped the social interface of the territorial states? In what way have interactions between the state, market and border society historically patterned transnationalism? These questions could have been unattended if my study focused on either time or space as a basic starting point of inquiry, but not both.

Relationships between transnationalism and nation-state as a territorial entity deserve the final consideration before I conclude this chapter. The examination of social dynamics at the state margin makes us rethink whether we can treat the national and the transnational as something oppositional. The emergence of national territoriality in Weberian sense and the inflows and outflows of people and commodities across the porous border are seemingly allelic in nature. The examination of the borderland history, however, attests that the very resonance between the two is the basis for the construction and evolution of the national space. In other words, the spatiality of the state is molded in the flux of people and goods, which, in turn, generates policies and implementation practices of the state to respond these flows. The appearance and maintenance of national space requires the dialectics between border society and the state.

The historical and ethnographic study of the borderlands of western Borneo suggests that nation-state and transnationalism have been mutually constitutive rather than exclusive. The relation can not be seen in either-or opposition. The functionality of the state has been strengthened by the development of transnationalism and vice versa. As transnational flows become more fluid and intense, national boundaries become more rigid; the clearer the boundary becomes, the more tense trans-border flows become. Without the socio-economic difference between Malaysia and Indonesia, most notable in the difference of monetary value, the national space has no meaning to the borderland nationals.

Looking back over recent two decades of socio-economic development along the border, the state's involvement in the transnational projects has been strengthened as a result of national policies deliberately aiming to utilize border niche for national development. The borderland is now in an advanced phase where the state development is creating a new state-society dialectic. The state's control of the national boundary, both in practice and as image, seems to start taming the borderlands, where transnational flows of labor and natural resources have been tolerated as they have no negative effect on entrepreneurial and national interests.

The physically porous border between Sarawak and western Dutch Borneo has become a social field characterized by disparities between the two sovereign territories, whose existence people on both sides of the border accept as long as benefits for them is generated. Intentional transgressions of the international boundary are the acts of denial of national space that simultaneously confirm its existence. The realization of territoriality is through the presentation of antithesis to the state, which in turn leads to policy implementation. Cases of offence and punishment continue as local people maneuver for personal gain. State and society thus exercise multiplier function. The dialectical process between state policing and adaptive transnationalism of local society contribute to the genesis of nation space. Clarifying how these two intersect is the way to understand how two seemingly contradictory social movements—the construction of national space and the simultaneous deconstruction of a state boundary through parochial transnationalism—are

general features of a borderland where two geo-bodies adjoin.

We are all latecomers in the eyes of people on the border where transnationalism is normative in their quotidian life. Observing the current spatial compression of communication, trade, and movement of people, we have just begun to think as if we have entered a new phase of spatial modernity. But this is not new at all. People have lived in transnational world from the age of commerce, when the search of merchant wealth went beyond the colonial map of maritime Southeast Asia, and the trans-sovereignty mobility of peasants and merchants was norm than exception. The genesis of the community in Lundu District lies in the transnational dynamics of the Malay maritime world of the late 19th century. After the decline of the Malay trading networks, which was brought by the Brooke colonial policies favoring the Chinese mercantilism to *nakoda* maritime trade, the Chinese *taukay* commercial networks played the major role in shaping the transnationalism in borderlands of western Borneo, whose illicit and ungrounded networks transcended the boundary of national economy.

Facing transnationalism in our everyday life, we now feel that the nation-state is not a single organizational principle for connecting us. The feeling that what we know about the state is very little has gradually replaced our confidence in all-powerful states. "Is the state really powerful?" For borderland residents, this question has been age-old, and the answer has been quite obvious. They have taken a look at the every move of the state as an exogenous institution, both colonial and postcolonial. They have observed the genesis of the national space in their village compound and forest, and their spatial identity or mental map differs from the school map.

Market, both the international market and local marketplaces, and borderland needs each other. Commodity and labor markets make use of the fundamental difference between two nation-states for profit. The prime force behind the creation and maintenance of borderland as a special socio-economic interface has been mercantile wealth and capitalism. The speed and volume of transnational flows, both documented and undocumented, are subject to the fluctuation of market price and the foreign exchange rate, production demand, the supply of natural resources, and the change in international economic climate.

Now social and natural resources become the subject of the state mobilization, and the total system of capitalism is in the process of incorporating the last frontier across the border. How will the residents of borderland cope with the transition from mercantile transnationalism to state-led capitalism based on cross-border deployment of labor? Would people be totally drawn into the larger system to accept its impact and become its agents or would they show us another way of re-entering and re-exiting national space? There is so much to learn from the location work of the people on the border, who have already entered transnational modernity much earlier than the majority of us.

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Who's Borders and Who's Resources in Transborder Natural Resource Management

Wil de Jong

Abstract: Transborder environmental and natural resource management is increasingly considered a necessary option to achieve sustainable resource management across or outside national borders or to reduce negative externalities across-borders. The chapter argues that proposals of transborder environmental and natural resource management should consider differentiated views between national level actors who consider national interests, and local actors who live in borderlands and who have different views of national borders and priorities for the environments and natural resources that are proposed for transborder management. In addition, the chapter argues that a historical review of differentiated views related to borders, territorial integrity and foreign access to national environments and resources, clarifies existing opposite positions. The chapter reviews the constrained relations between groups in Loreto, Peru and Central Government related to various bilateral negotiations that have affected territorial integrity and access of neighboring countries to environments and natural resources within Peruvian territory. The chapter gives much attention to the latest conflict between Peru's Central Government and various groups of the Department of Loreto of northeastern Peru, when President Fujimori signed an agreement with Ecuador that gave rights over Peruvian territory to Ecuador. The proposal was widely rejected in Loreto, leading to violent protests. The chapter draws general conclusions of some critical aspect that need to be considered when moving forward with transborder environmental and natural resource management proposals.

9.1 Introduction

Transborder environmental and natural resource management refers to a broad range of activities, as suggested by the chapters in this volume. As an analytical scholarly activity, a few prominent fields dominate the debate. Since environmental and sustainable natural resource use issues have entered the public arena, a process that took place during the 1970s and 1980s, the international community has proposed and enacted an important number of international treaties and agreements that aim to regulate the exploitation of environments and natural resource that have transborder effects. The debate is, among others, held in the peer reviewed academic journal *International Environmental Agreements*, as well as in numerous monographs that have been dedicated to this topic in the last decade (e.g. Conca 2005; e.g. Castells and Ravetz. 2001). A second field that is relevant to highlight here is a debate on borderlands, which has become prominent again in recent years (Horstmann and Wadley 2006; Humphries 2007). Borderland studies refer to crossborder exchange in borderland regions, as well as to often complex and tense relations between borderland and Central Government. A third relevant field of debate is related to transborder conservation initiatives, a topic that has received much analytical attention often based on actual projects since the 1990s. The initiatives sought to improve conservation outcomes through a coordinated transborder conservation management of contiguous natural areas that straddled from one country into a next (e.g. Plumptre et al. 2007; Portman 2007; Wolf et al. 2006).

Proposals for transborder environmental and natural resource management in many cases assume clearly defined, national borders. In addition, decisions related to transborder management are in many countries, and certainly in countries that hold tropical forest, the prerogative of Central Government. These conditions, however, as has been adequately proven by numerous borderland studies (Horstmann and Wadley 2006), do not adequately consider differences in views between Central Government and actors who operate in peripheral regions, related to territorial integrity and access rights to resources. This suggests that a debate on transborder environmental and natural resource management necessarily needs to consider who the protagonists of the borders are and whose interests are being addressed when transborder management of environments and natural resources is being considered.

The present chapter will discuss this point by analyzing the case of transborder natural resource management agreed between the governments of Peru and Ecuador, in a treaty signed by the two countries in 1998. This agreement, as the chapter will demonstrate below, was severely questioned by the population of the city of Iquitos, Capital of the Department of Loreto, who went out to the streets to violently protest the signing of the treaty a few days before it

actually happened.

A second point which the chapter makes is that the understanding of the constrained relationship between actors who have differentiated views on borders and access rights requires a historical perspective of these differentiated views. Current differentiated views often appear to be the product of historical processes in which opposite positions have lingered and hardened over decades or centuries. Transborder environmental and natural resource management proposals need to consider differentiated views, and in addition, need to consider their historical evolution.

The paper will proceed with reviewing four historical moments related to the definition of borders and access to the environments and natural resources by foreign countries of the region of Loreto, the northern Amazon region of Peru. Section 9.2 summarizes the process that led to the incorporation of the Department of Loreto into Peru. Section 9.3 and 9.4 summarize two moments of conflict between Loreto and Peru's Central Government, which are directly related to borders, territorial integrity and access of foreign countries to environments and resources in Loreto. Section 9.5 in turn discusses in detail the latest expression of this conflictive relationship between Peru's Central Government and important sections of Loreto's population, related to solutions to a territorial conflict with Ecuador. The territorial conflict and the violent responses of the Loreto population to the solutions proposed by the Government took place between 1995 and 1998. Section 9.6 draws general conclusions from the cases discussed here.

9.2 The incorporation of Maynas into Peru

The modern division between Spanish speaking countries of South America and Brazil is a result of how Spain and Portugal initially occupied the interiors of the continent. In 1542, the Spanish Crown created the *Virreinato* of Peru, with the capital of Lima. Its territory at that time stretched all the way from Panama to the south of the continent, but with administrative subdivisions called *Audiencias* and *Comandancias Generales*. The Tordesillo Treaty, which had divided the world in a Spanish and Portuguese area of influence, stipulated in theory the South American area of influence between the two countries. The Spanish incursions into the Amazon, mostly initiated from Quito following the Napo river route, began mid 16th century. During that time the Portuguese expanded rapidly their incursions westward into the Amazon territory. The Spaniards, on the other hand, mainly focused on Andean territories and invested little to assure their control on the Amazon lands that were theirs under the Tordesillo Treaty.

The Spanish crown, in cahoots with the pope, facilitated the establishment of the missionary estates of South America (Saavedra Perera 2006), to be administrated by the religious orders in charge of christening the natives. The establishment of the estates had both a religious purpose, but was equally meant to contain the advance of the Portuguese. The Jesuits became in charge of the Spanish missionary states, although a parallel secular government structure was also established. The *reducciones*, the settlement to which the Jesuits relocated entire groups of indigenous people, contributed importantly to the social disruption of the Amerindian population. At the same time, however, the Jesuits intended to protect them from the scrupulous raids and exploitation of the Portuguese mainly interested in cheap labor, as well from the narrow exploitative interests of the Spanish crown. This critical position of the Jesuits, and the threat to the European interests that it included, contributed importantly to the expulsion of the order in 1767 from all South America. The missionary states of Maynas, later the *Comandancia General* of Maynas, included territories that are now part of the Peruvian and Ecuadorian Amazon.

Maynas was a province of the *Audiencia* of Quito, when it became a missionary state. In 1739, when the original *Virreinato* of Peru was subdivided into three *Virreinos*, Maynas became part of the *Virreinato* Nueva Granada which largely included what is today Ecuador and Colombia, and not of the new but smaller *Virreinato* of Peru.

To address the South American territorial division quagmire, Spain and Portugal signed the Treaties of Madrid (1750) and Ildefonso (1777) which established a more detailed division between the Spanish and Portuguese territories in South America. The treaties appointed border commissions to undertake *in situ* border identification and demarcation. While both countries sent their members, the Spanish participants were provided with little resources and the efforts were dominated by the Portuguese commission members. The efforts of the Spanish commission members under leadership of Francisco Requena, a prominent and well known South American expert at that time, failed to force the Portuguese to recognize the divisions between the two territories. One important outcome however is that in response to Francisco Requena's recommendation, the Spanish crown in a Royal Decision of 1802 reassigned the territory of Maynas from the *Virreinato* of Nueva Granada to the *Virreinato* of Peru. Only two decades later Peru

and Ecuador became independent countries, and the 1802 royal decision remained a crucial argument to defend the incorporation of Maynas into the new country of Peru.

The decision where to allocate Maynas, was taken in the city of Moyobamba, today located in the Department of San Martín, in the foothill of the Andes. This decision was in line with the accepted principle that the new countries were to include the territories that were under their administration before independence, and the 1802 Royal Decision had indeed allocated Maynas to the *Virreinato* of Peru. The decision failed, however, to consider the voice and aspiration of the diverse populations that lived in the various settlements within Maynas, who might have preferred a different allocation, or even to become an independent state (Saavedra Perera 2006). The validity of the 1802 Royal Decision has repeatedly been questioned by Ecuadorean governments when trying to restore control of an important part of what is the Peruvian Amazon today. The exact limits between the new nation states were not at all yet clearly defined.

9.3 Declaration of the Federal State of Loreto

During the 19th century the name of Maynas was changed to its current name, Loreto. The region suffered from insufficient attention and support from central government. The region's isolation can be demonstrated by how communication with the Capital took place. Governor Ricardo Seminario y Aramburu, who occupied his new post in 1895, now in the city of Iquitos, traveled from Lima through the Magellan Strait, north to Belem and up the Amazon river, a trip that took four months. The new Peruvian state was incapable of controlling the limits or the internal affairs of the vast territory of Loreto. This led to a progressive encroachment of neighboring states Brazil, Ecuador and Colombia. In 1851 the then president José Rufino Echenique solved this problem by applying the *Uti Possidetti de Facto* principle: he who occupies the land, owns it. Hence he transferred important parts of Maynas as it had been demarcated by the end of the 18th century, to neighboring countries.

This process coincided with a change of Brazil into a federal state in 1889. The Peruvian president Nicolás de Pierola had also hinted in his presidential campaign to support changes to a Peruvian Federal Republic. Under these circumstances, Governor Ricardo Seminario y Aramburu, being tired of the lack of interest and resources from Central Government and offended by the liberty with which Loreto territory was handed over to neighboring countries, declared the Federal State of Loreto of the New Federal Republic of Peru on May 2nd 1896. The initiative was widely supported by the Loreto population everywhere (Morey Menacha 1996).

In Lima, on the contrast, the declaration was considered a revolutionary step with behind it a desire to unsettle the reigning president and to strive for separation from Peru. Lima sent a warship, ironically with the name "*La Independencia*" (The Independence), following the Magellan Strait-Belem-Amazon route, while a different group of soldiers traveled via the Pichis river. Noticing the disapproval from Central Government, and with perspective of having to face a battleship and a small army, Seminario y Aramburu announced his resignation as the first president of the Federal State of Loreto. The Minister of War arrived in Iquitos on October 10, 1896 and took control of the departmental government.

9.4 The Revolution of 1921

The background to the 1921 revolution in which a military person, Captain Cervantes and his associates declared the independent state of Loreto, are the collapse of the rubber industry in the entire Amazon basin, and the Peruvian Government policy of resolving border disputes.

The Amazon rubber boom had started late 19th century with the invention of the rubber vulcanization and the demand of rubber by a growing car industry. The virtual monopoly that the region had over rubber production brought great wealth to its people, but provided also significant revenues to the State Coffers. The substitution of Amazonian natural rubber by plantation rubber produced in Asia caused the virtual collapse of the industry during the second decade of the 20th century.

In addition to the personal losses, the collapse caused a great reduction in income to the Peruvian State. This had two relevant consequences: (1) It probably contributed to the sell out attitude of Peruvian President Augusto B. Leguía in his efforts to settle border disputes with neighboring countries Brazil, Colombia and Ecuador, and (2) it also drasti-

cally diminished the flow of government funds from Lima to Iquitos, the administrative capital of Loreto.

The border disputes between Peru and its four Amazonian neighbors that characterized the 19th century continued into the 20th century. The sales of Acre by Bolivia to Brazil in 1902, for instance, at a time when the disputed territory was still under arbitration, totally ignored claims by Peru over land that it was given under the territorial division between Spain and Portugal during the 18th Century (Anonymous. 1907; Morey Menacho 1996). In 1911, Colombia invaded the Rio Caqueta, then formally still part of Peru, to annex it into Colombian territory. The Loreto military staff sent Coronel Oscar Benavides to the region and he actually succeeded in recuperating the territory. But President Leguia ordered his return after having signed an agreement with Colombia that agreed to a territorial division based on the *de facto* occupation at the time of signing the agreement. In 1922 the same president signed the Salomon Lozano Treaty, which gave the Caqueta basin, the northern bank of the Putomayo river and all the adjacent lands, and the Amazon Trapezium to Colombia. Similarly, during the last decade of the 19th century and early decades of the 20th century Ecuador made repeated incursions into Peruvian territory, often leading to armed clashes, for the sake of effectuating its territorial claims. These incursions were responded to by military located in the border regions, but these efforts received little support from the Leguia Government.

The decline of the export of rubber and the related decline in lucrative incomes that entrepreneurs and the Peruvian Government obtained from this trade, lead to serious political tensions between Lima and Iquitos since 1918. Several specific events demonstrate this tension. One is the sacking of all administrative personnel born in Loreto by the then Governor, Emilio Soyer y Cavero, because the people from Loreto were considered to be opposed to the Leguia administration. The Loreto natives were all replaced by people from Lima (Morey Menacho 1996). The group of people who were negatively affected by these measures organized the *Liga Loretana* and organized public meetings, at one of which the region's Senator, Enrique S. Llosa, was assassinated.

Worse was to come. Since 1921, Lima failed to send funds to finance of what had become a highly inflated and inefficient bureaucracy. For two years the administrative personal did not receive any salary and people abandoned their posts. Administrative personnel located in border posts was totally abandoned and left to fetch for themselves. At the same time, the military commander and soldiers from the Andean region engaged in abusive acts towards their Loreto counterparts and the public in general, while the Governor spent the little resources that were irregularly sent by Central Government on personal and political interests.

Under these deplorable conditions, on August 5, 1921 Captain Guillermo Cervantes Vasquez and a group of sympathetic army officials rebelled against the Leguia Government, giving as their mean reason the lack of interest and support from Central Government for the region, and the progressive handing over of Peruvian territory to Colombia. The rebelling group declared itself the: *Movimiento Pro Patria Amazonica* (Movement for an Amazonian Homeland) and it was widely supported by the Loreto population. It took indeed various measures to solidify independence, including emitting its own currency, and setting up defense in various strategic locations of Loreto.

The declared independent Amazonian Homeland did not last long. Central Government sent troops via two different routes to Loreto. In addition, the independence movement soon lacked food and ammunition for its troops. The rebelling officers fled to Guayaquil, in Ecuador and on January 2nd 1922 the Peruvian Government took control again of Iquitos and Loreto.

9.5 The Peruvian State and the Territorial Conflict with Ecuador

The borderland dispute between Peru and Ecuador has been much publicized in international media. It was the last true armed clash between two countries in the American continent contesting sovereignty over territory. The dispute and subsequent steps taken by the then Peruvian president Alberto Fujimori, to resolve the tension and mend ties between neighboring countries have been widely discussed in the media. A more localized event in the city of Iquitos, located within the territory that was contested by Ecuador, has received almost no international attention. In the weekend before the final signing of the new peace agreement between Peru and Ecuador, on October 24 1998, the city of Iquitos turned into a war zone, because several parties protested against some of the territorial concessions made by the Central Government.

As suggested in the previous sections, the territorial dispute between Peru and Ecuador has a long history. Animosities, negotiations, arbitrations and many armed clashes (34 since 1884 according to Simmons 1999: 10) have

marred the relations between the two countries. In 1941 the two countries fought their previous war, which lasted for 10 days. After Peru defeated the Ecuadorian army, and under the arbitration of Brazil, Argentina, Chile and the US, the two countries signed the Rio de Janeiro Protocol, which established the boundaries as they are today. The protocol allocated some 200,000 km² of disputed land to Peru. Under the protocol, all but 78 km of the 1421km long border that Peru and Ecuador share, were marked. The unmarked stretch was located in the *Cordillera del Condor*, east of the city of Zamora, an area believed to be rich in gold, uranium and oil (Franco 1997). Already the protocol signed in 1942 includes clauses that Peru will facilitate Ecuador's access to the Amazon River, and that Ecuador has the right to hold land in concessions as trading posts along the route that Ecuadorian vessels need to follow to reach Brazil.

Even though the Rio Protocol was hailed as a final solution to the border conflict between the two countries, not many years later Ecuador questioned its validity, arguing that it was forced upon Ecuador as the losing party of the war (Maier 1969). Ecuador argued that new geographic evidence concerning a particular watershed that had not been adequately recognized in the border demarcation invalidated the protocol (Simmons 1999). In particular, Ecuador claimed some 130 square miles in the *Cordillera del Condor* region, which under the Rio Protocol was assigned Peruvian territory. In 1960 Ecuador officially declared the protocol invalid (Simmons 1999: 10).

The lack of clarity in the Rio Protocol allowed the disputing parties to continue with irreconcilable claims. Fujimori, elected president in 1990, went to great efforts to appease neighboring countries because of Peru's precarious political situation (Simmons 1999). Already in 1992 he proposed the completion of the demarcation of the shared border in exchange for navigation rights through the Napo and Amazon Rivers inside Peru, and the use of port facilities (Simmons 1999: 10-11).

Every year around the 29th of January, the date that the Rio Protocol was signed, within Ecuador ill feelings about the border arrangements flare up, and the same happened in 1995 (Elbow. 1996). That year the residing president of Ecuador, Sixto Duran Ballen, declared a national emergency and mobilized the national reserve. When Peru mobilized its army near the border in response, Ecuador accused Peru of invading its sovereign territory. The fighting that occurred, including intense bombing (Franco 1997) killed soldiers on both sides, but also 28 indigenous inhabitants who were against their will made to join the fighting and who suffered displacement and habitat destruction (Ibid.). Simmons (1999: 12) estimates between 200 and 1500 casualties.

While the 19 day war was intense, neither party was interested in letting the situation escalate. On February 27, 1995 the two parties signed the Itamaraty Peace Agreement, but skirmishes continued, followed by subsequent rounds of negotiation. The February fighting, and skirmishes in following months positioned the Ecuadorian army as the victorious party. Finally, on October 26, 1998, the new Ecuadorian president Jamil Mahuad, who had replaced Durán-Ballén, and Fujimori signed the Brasilia Presidential Act, which was the final settlement of the conflict (Simmons 1999: 20).

Important for what happened in the city of Iquitos, are the terms of settlement of the conflict. Under strong influence from the Guarantors, the disputed stretch of the border was to be demarcated as originally envisioned in the Rio Protocol. Although this constituted a major concession on the side of Ecuador, the country in return received a one square kilometer area of land across the border to be held under conditions of private ownership, but remaining under Peruvian sovereignty. The two countries established an ecological park stretching across the border with unimpeded transit, but not to be entered by any military force. Ecuador was also given navigation rights through the Napo River and further down the Amazon River, as well as the right to establish two trading centers along that trajectory.

Violent Responses in Iquitos

The solution brought to the border dispute between Peru and Ecuador has been hailed widely as an excellent and outstanding achievement. Simmons (1999), for instance, argues the relevance and importance of Guarantors in the settlement of these kind of conflicts, while Mcneeley (2007) and Ponce and Gherzi (2003) refer to the settlement as a successful example where so called peace parks have contributed to resolve armed conflicts. More sobering, however, are the events that took place in Iquitos, by then a city with about half a million people located in the middle of what Ecuador once claimed as its sovereign territory.

After the 1995 conflict between Peru and Ecuador, but especially when negotiations between the two governments took place, sentiments became strong about territorial integrity, or actual concerns about threats of Ecuador taking over parts of Loreto and expulsing Peruvians from their houses and land. These sentiments were fed by the public

media and the campaigning of the Patriotic Front, a local grass roots organization that was set up in the late 1970s to claim a larger share of oil revenues generated in the region for Loreto's development. During the years after the latest Ecuador-Peru clashes, the Patriotic Front organized public events initially to reaffirm national frontiers while the border conflict unfolded, but later to protest the Government who it accused of not considering local voices in the negotiations while contemplating a settlement that included ceding national territorial (Chirif 1999: 1).

Violent protests in the city occurred in the weekend October 24-26, 2007, when large numbers of protesters in Iquitos took to the streets. The turbulences caused five deaths, while protesters burned about a dozen buildings, including six offices of state administrative agencies. The protesters also attacked private businesses held by Chinese descendents and recent migrants, and plundered numerous shops and restaurants (Chirif 1999).

The triggers of the protested apparently was a meeting organized by two Peruvian State Ministers on October 22, who had come to Iquitos to convey and seek approval for the terms of the Peace Agreement between Peru and Ecuador to be signed on the following Monday, and to set up a Committee of Assistance to the Peace and Development of Loreto. At this meeting the Patriotic Front was severely criticized by various participants. The newly formed committee then planned a public meeting on Saturday 24-10 in the city larger public squares. In addition to the protagonists of the meeting, two other groups showed up at this event, one supposedly consisting of people belonging to the Patriotic Front and another one likely supporters, or hired thugs, of one of the candidates who had participated in the mayoral elections two weeks earlier (Chirif 1999).

Soon after the several groups, arrived at the location where the meeting was planned, participants started to burn cars before their anger was directed at the public buildings. The second day of the turbulences, Sunday October 25, shops owned by Chinese entrepreneurs became targets, apparently because their owners were identified as being of the same nationality as the country's president, Fujimori, who had sold out the country.¹

The Iquitos clashes are much less documented than the Peru - Ecuador conflict itself, but additional studies give some confirmation of the underlying sentiment of the local population against the outcomes of the border settlement. For instance, a report on possible threats to security in Peru that has Iquitos as one of the locations where research on this matter was carried out, mentions as one of the grievances the selling out of the government to Ecuadorian interests (Gray 2000).

9.6 Discussion

Transborder environmental and natural resource management can be conceptualized using its three composing terms, border, environment and natural resources, and management. Its non-transborder equivalent, environmental and natural resource management is a concept that has been widely analyzed and discussed in recent decades as part of international development efforts and a worldwide concern for the pressure that human society is putting on its resources. Environmental and natural resource management can be analyzed from numerous technical, economic, social and political perspectives.

The transborder dimension in the case of transborder management necessarily implies a higher profile of the political perspective, because the resources in question or the externalities of its management across nation state borders. The nation state and its Central Government have as a principal task to preserve territorial integrity and national sovereignty over its territory. The latter aspect is affected when some kind of transborder management is being considered. Transborder management proposals, at least in an initial phase, become a national affair that requires some kind of state position, from Central Government, or its implementing agencies.

While the Peruvian case discussed here may appear somewhat atypical, because it concerns settlements of border conflicts by means of granting territorial concessions to a neighboring nation, the case has common features with other cases discussed, for instance, in this volume. It concerns resources that cross national borders and one of the parties has a need for these resources across its borders and is prepared to undertake actions that are meant to address those needs. In the recent Peru-Ecuador territorial dispute these actions involved armed skirmishes in an undeclared war. In a later phase the actions involved negotiations and a settled agreement that allowed Ecuador to undertake "natural

1. Fujimori is of Japanese descendents and holds Japanese nationality. However, he is identified as "El Chino", suggesting Chinese nationality.

resource management” within Peruvian territory. The management implies one km² of land under private property, a contiguous conservation area that is located partly in the two country’s territory, use of waterways by Ecuador in Peruvian territory and use of trading posts along these waterways on land that is held under concession by Ecuador.

The atypical character of the Peru case discussed here, partly explains the extreme and opposite views on borders, territorial integrity and access to resources of foreign nationals. Where it concerns environmental and natural resources management in a non-transborder setting, such different views and subsequent contestation are common when the environments and natural resources are of interests to more than one party. Complex mechanisms define the outcomes of these contestations that usual involve national or regional legislation and an authority that holds the prerogative to allocate exclusive or shared access rights to parties based on some generally accepted principles. Needless to say, that rent seeking activities or political manipulation of some of the parties involved may influence these outcomes. There is no reason to assume that the latter conditions are substantially different in cases of transborder environmental or natural resource management, as this chapter demonstrates.

A last point that needs to be made here is that the opposite views and positions about the destination of environments and natural resources, which is largely influenced by the allocation of access rights, is a product of current interests and needs of the parties involved, but in the case of a geopolitical circumstances may also highly be influenced by political schism that have historical roots. This is particularly relevant in transborder environmental and natural resource management cases, because of the very complex nature of modern nation states and especially those within tropical forest regions (e.g. Swatuk 2006). Modern nation states while founded on the basis of a population that share common features and aspirations are more often than not compounded of sub-populations that differ in ethnicity, language or culture. This is especially the case where it concerns groups who live in remote borderlands with ethnic, linguistic or cultural differences. This in consequence is bound to lead to diverging views between Central Government and borderland populations when the former is proposing or negotiating transborder environmental and natural resource management. Historical trajectories are one contributing factor to these differentiate views.

9.7 Conclusions

Transborder environmental and natural resource management has taken place throughout human history, but it is becoming increasingly common worldwide because of the interlinking of modern economies that rely one common pool resources or because of crossborder effects of resource use in single countries. While many proposals and projects of transborder environmental and natural resource management are being developed in fairly conflict free circumstances, bi-national or multination political tensions are certainly one triggering factor for such proposals or projects. Border disputes and subsequent settlements by means of transborder resource management arrangement is therefore a relevant type case that allows drawing general conclusions that will be helpful in understanding future similar cases.

The case of Peru, and how it proceeded with settling its border dispute with Ecuador, suggests two important principles. One is that in transborder environmental and natural resources management proposals, diverging views of the terms of agreements are likely to occur between actors on the same side of the border, and in some cases these views may actually lead to serious internal conflicts. These conflicts on the one hand need to be addressed and on the other hand they are likely to influence the outcomes of the transborder management proposals or projects. And finally, when trying to understand diverging views between parties on the same side of the border, it is relevant to understand the historical trajectory of these opposing views. A historical perspective is likely to contribute to the understanding of the opposite and conflicting views, and may contribute to more adequately addressing them.

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Transboundary Resource Management: The Case of the Marine Turtle Conservation in the Philippines¹

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Abstract: In the Philippines, one of the pressing transborder concerns is the marine resources protection and management, specifically, the Turtle Islands protected area, home of different species of sea turtles that are presently endangered. Like any other natural resources that are becoming more politically, legally and ecologically complex, the Philippine government does not just seek more coordination between different agencies, stakeholders both local and national levels but also with governments who must work across jurisdictional boundaries. This chapter looks at how collaborative resource management is different when an international border is involved as in the case of the Turtle Islands Heritage Park Management (TIHPA) between Malaysia and the Philippines and partially on the bigger Sulu-Sulawesi seascape bordering the Philippines, Malaysia and Indonesia with regards to marine turtle conservation. The paper outlines the relevance of transboundary cooperation, the evolution of policies and the modalities forged, the needs, interests and roles of various stakeholders, policy implications, constraints and updates on such initiatives intended to protect and conserve the marine turtles in southern Philippines.

10.1 Introduction

The Philippines as a nation faces a variety of trans-border problems with its neighboring countries. Being an archipelago of more than 7,100 islands with a land area of about 300,000 square kilometers, the country has more internal land border than land trans-border problems. The country is bounded by countries such as China, Vietnam, Malaysia, Indonesia, Japan and others. Such characteristics make the Philippine authorities helpless in enforcing laws to protect and conserve the vast natural resources in the marine ecosystem habitats where many of the species are considered endangered.

Presently, one of the most pressing issues on resource movement and governance are related to the marine natural resource sustainability. Blessed with one of the rich and diverse marine resources, Philippines' marine waters cover 2.21 million square kilometers with a coastline of 22,450 kilometers and an estimated 27,000 square kilometer of coral reefs. The marine products provide substantial contributions to the country's not so bright national economy. These however continue to be depleted in an alarming rate due to unsustainable fishing, pollution, land base activities, ecotourism, shipping industry, coastal development and entry of foreign vessels fishing in Philippine waters. The country can not isolate itself from trans-border issues such as movement and trading of goods and services, natural migration of wildlife, and others.

The Philippines shares complex environmental and natural resource trans-border issues with neighboring countries. These can be categorized into two: 1) those that concern management and protection of terrestrial and marine environment, and 2) those that are considered hazards to human health. Trans-boundary problems that the Philippines has to deal with are wildlife trade of protected wildlife species both flora and fauna, tsunami, human trafficking, waste dumping in international waters, climate change, entry of banned agricultural inputs particularly pesticides and herbicides, and bird flu concerns caused by migratory birds.

Being an archipelago, the open seas surrounding the Philippines attract all forms of illegal fishing and other exploitation of marine resources. Maritime industry activity such as shipping of trade materials including oil in international waters are threats to the marine resources due to the possibility of oil spillage. At present, one of the most urgent trans-border environmental management problems is the protection and conservation of marine life species in the north bordering northern Philippines and Taiwan and in the southern international waters of south China seas and

1. The author wished to thank Dr. Gerard Persoon of CML, Leiden University for the encouragement to write on this topic and the Cagayan Valley Programme on Environment (CVPED) and the Isabela State University at Cabagan, Isabela Philippines for financial assistance.

the Sulu-Sulawesi.

Among the marine species that have borderless habitats and movements that need immediate attention are the marine sea turtles listed as endangered species by CITES. Marine turtles can be found in almost all parts of the archipelago but most of the important nesting sites are the Turtle Islands municipality, province of Tawi-tawi, located at the south-west tip portion of Mindanao. Marine turtle habitats cover a wide range of ecosystems. They can even travel beyond state to state or across political boundaries such that their existence is threatened by human activities between countries. One single government finds it difficult if not impossible to protect and conserve the species. This situation calls for trans-boundary cooperation between two or more countries to sustain protection and conservation efforts in marine protected areas.

This chapter presents an overview of how the Philippines Government works with other countries in compliance to trans-border agreements it signed to protect and conserve marine resources in general and marine turtles and their habitats in particular.

10.2 Transboundary Conservation Cooperation

The Relevance for Transboundary Cooperation

Transboundary protected areas (TBPAs) are adjoining areas that involve a degree of cooperation across one or more boundaries between or within countries (Brunner 2003). As adopted by the IUCN, TBPA is an area of land and/or sea that straddles one or more boundaries between states, sub-national units such as provinces and regions, autonomous areas and/or areas beyond the limits of national sovereignty or jurisdiction and maintenance of biological diversity and of natural and associated cultural resources managed cooperatively through legal or other effective means.

There are at least 666 protected areas representing 113 countries which are divided by international boundaries. There are varying levels of cooperation and management agreements within and many are already TBPAs while others have the potential to become one. It is believed that transboundary cooperative action is a means of achieving regional integration and securing landscape and seascape conservation at a scale not previously possible. Clearly, strategies to conserve biodiversity call for transboundary cooperation in relation to shared ecosystems and other conservation concerns.

Aside from the benefits for biodiversity conservation, the establishment of TBPAs by two or more countries also helps encourage friendship and reduce tension in border regions. The principal benefits as identified through the IUCN "Parks for Peace" initiative, are:

- Promoting international cooperation at different levels and in different fora;
- Enhancing environmental protection across ecosystems;
- Facilitating more effective research;
- Bringing economic benefits to local and national economies;
- Ensuring better cross-border control of problems such as fires, pest, poaching, marine pollution and smuggling.

Trans-boundary initiatives develop at different levels, namely: high-level (which may be adopted by head of states); locally-based (initiated by staff members in the field who experienced real benefits through cooperation in one or more specific task); and third-party (conservation and NGO acting as third party advocate). It is very encouraging to see the recent surge of support that such linkages are getting from various sectors, including bilateral and multi-lateral aid agencies in many countries throughout the world.

10.3 Turtle Islands: World Heritage Priority Site

In Southeast Asia many sites that have been identified as having the need and possibility for transboundary conservation. Some of the current and potential transboundary reserves were identified through related workshops of the World Heritage and ASEAN Heritage Parks. Areas considered are those belonging to neighboring countries and the sites are part of the same ecosystems and home of the same protected species and habitats. Sometimes, the reserves are geographically adjacent or close to each other and the protected species migrate from one site to another. One of such locations is the Balabac Strait or Turtle Islands between Malaysia and the Philippines.

The Turtle Islands legally belong to Philippines and Malaysia. There are hundreds of small islands but nine of

those are prominent and are nesting sites of seven marine turtles that need protection. Out of nine islands, six belong to the Philippines and three fall under the Malaysian state of Sabah. Six marine turtle species nest in the three Malaysian islands: Palau Selingaan, Palau Gulisaan, and Palau Bakkungan Kechil while only two turtle species are nesting in the six islands that belong to the Philippines. Five of the Turtle Islands under the Philippines jurisdiction are permanently inhabited by indigenous peoples.

The Philippine Turtle Islands

The Turtle Islands are located south of Palawan province, northwest of the Tawi-Tawi mainland and northeast of Sabah along the international limits separating the two countries. Approximately 1,000 kilometers from Manila, it is one of the municipalities of Tawi-Tawi province with an aggregate land area of 308 hectares. The six islands: Boan, Lihiman, Langaan, Great Bakkungan, Taganak, and Baguan are located near the intersection of 6 degrees 10 minutes N latitude and 118 degrees 10 minutes E longitude. The smallest island (Langaan) measures about seven hectares and the biggest (Taganak) is about 116 hectares. Langaan island is relatively flat and located on an extensive coral reef while Taganak island has the highest point of 148 meters above sea level. Population density of the five settled islands is high and people practice agriculture.

Two types of marine turtles namely; the green turtle (*Chelonia mydas*) and the hawksbill turtle (*Eretmochelys imbricata*) nest on the Turtle Islands, their only major nesting ground in the whole ASEAN region. More than 1,000 turtles of both the green and the hawksbill turtles that are nesting annually. Worldwide, there are only around ten remaining nesting sites while marine turtle populations were noted to have critically declined to alarming levels. In August 26, 1999, the Turtle Islands were proclaimed as a wildlife sanctuary and identified as extremely high importance for biodiversity conservation.

Marine Turtles: Their Distribution and Status

There are seven marine turtle species found worldwide namely: green (*C. mydas*), hawksbill (*E. imbricate*), olive ridley (*Lepidochelys olivaceae*), loggerhead (*Caretta, caretta*), leatherback (*Dermochelys coracea*), and flatback (*Naturator depressus*). All of them are highly migratory and often pass through territorial and international waters from feeding to nesting grounds and back (Halim 2003). Five of them are included in the IUCN Red list of 2003 as critically endangered, one endangered and one species still with undetermined conservation status because of insufficient data.

Out of seven marine turtles found in the world, five species can be found in the Philippines. These include the green, hawksbill, olive ridley, loggerhead and leatherback. They are distributed in several islands of the archipelago from Batanes in the northern tip of Luzon down to Tawi-tawi, the southern-most part of Mindanao. Around 56 sites are confirmed nesting beaches in the entire country. However, most of the nesting areas in Luzon, Visayas and Mindanao suffered dwindling numbers of eggs laid annually including the nesting sites in the Turtle islands and Tawi-tawi in Mindanao.

Description and Peculiar Characteristics of Marine Turtles

Marine turtles are ancient creatures that have existed for more than 200 million years and can live in a variety of environments from dry land to open seas. Comprising eleven families, there are only two families, Cheloniidae and Dermochelyidae of living sea turtles and of the 220 turtle species only seven are marine. The Cheloniidae are six hard-shelled species while the Dermochelyidae comprise only one known species, the leatherback turtle. Turtles are reptiles that live inside shells. The top shell, over the back, is called the carapace and the shell at the bottom, over the belly, is called the plastron. These are joined along both sides at the bridge.

Marine turtles are heterosexual, with sexual dimorphism being evident in adults. Males can be distinguished from females only when they are adult or nearly adult. Sexual differentiation in hatchlings, juveniles and sub-adults is almost impossible without internal examination. Other peculiar characteristics include the following:

- Marine turtles approximately stay two months on land and spend the rest of their life in water;
- Females go back to the beach to nest where they were previously hatched;
- Males never come back to where they were hatched;
- Males move ahead to the breeding grounds close to the nesting areas when females are ready to mate;
- Ovulation takes two weeks to reach oviposition;

- Nests are usually 80 centimeters deep with a single laying clutch of between 85 to 100 eggs;
- In one breeding season, there are 3-4 clutches with intervals of two weeks;
- It takes 35-50 years for females to reach sexual maturity and they lay eggs every 2-5 years;
- Sex is determined by the temperature during hatching, with high temperature producing females and a shorter incubation period;
- During incubation or immediately following emergence from the nest, the hatchlings are imprinted to the earth's magnetic field that marks the rookery, which guides them back to the same site when they are sexually mature;
- Great mobility of marine turtles makes them vulnerable to a myriad of threats.

Economic and Ecological Importance of Marine Turtles

Marine turtles are a source of meat, and as such one of the most sought delicacies in expensive restaurants. Their carapace has multiple uses such as decorative parts for many souvenir items. Their tourism value gives more reason to keep them than killing them as many world-class diving resorts worldwide make use of the live marine turtles in the wild to attract tourists.

Another significant contribution of marine turtles is their role in the marine ecosystem. Green turtles feed on sea-grasses and algae that happen to be one of the most productive ecosystems. The turtles help maintain the sea-grass beds and make them more productive. Without their grazing, the sea-grass blades grow tall and get choked by sediments that obscure the light and promote diseases. Furthermore, sea-grass is quickly digested by marine turtles and becomes available as recycled nutrients to the many species of plants and animals that live in the sea-grass ecosystem. Sea-grass beds also function as nurseries for several species of invertebrates and fish, many of which are of considerable value to commercial fisheries.

Loggerhead turtles eat many types of invertebrates such as mollusks and crustaceans, and can change the seabed by mining the sediments for their favored prey. They also carry veritable animals and plants on their shell. More than 100 species of plants and animals have been recorded living in one single loggerhead turtle and depend on turtles to have somewhere to live and to prosper. The future for many of these species is intimately linked to marine turtle survival. Another marine turtle, the leatherback, is a major jelly fish predator. It provides natural ecological control of jelly fish populations. Overabundance of jelly fish may reduce fish population as they feed on fish larvae.

10.4 Changes and Threats in Environmental and Natural Resource Management of Turtle Islands

Eyewitnesses claimed that thirty years ago, it was common to see hundreds of fresh turtle tracks each night on most of the beaches of the Turtle Islands. At Taganak island nesting occurred year round, with as many as 60 or more nesting in a single night especially during the months of July and August. In recent years, it has become rare to observe more than 40 turtles nesting in a single night even during the peak in the nesting season from July to September. The reduction of marine turtle populations and nests are due to natural threats, catastrophes, and harmful human activities, among others:

- *Natural threats and catastrophes.* There are many natural hazards that marine turtles have to face in their life cycle. Even if their eggs are not collected by people, their survival is still not assured because they face other threats. Monitor lizards, ghost crabs and even rats and ants can dig into the nest and devour the eggs. Once they are hatched, the hatchlings must dig themselves out of the nest and make their way to the sea. While crawling towards the sea, they can be eaten by birds, dogs and cats. Offshore they can be eaten by predatory fish waiting for them to cross the reef during their first swim. Even if they were able to escape from those threats, adult turtles have to avoid large predators such as sharks and killer whales. Turtles survived countless of these threats through million years, but people are pushing them closer to the brink of extinction. Needless to say, only people can restore them to their old glory.
- *Harmful human activities* include the following:
 - *Trawlers* are operating around the Turtle islands catching shrimps that drag large nets along the bottom catching whatever gets in their way including turtles. They are part of the incidental catch or by-catch. An average of three turtles is caught during a single night. Trawlers are not from the Turtle Islands nor are

they from the Philippines.

- *Long-line Fishing* is intended to catch sharks, where Sabah is among the good market of shark fins in Asia but hundreds of baited hooks on a single line may attract hungry turtles to the easy bait.
 - *Dynamite Fishing*, also known as blasting, kills any form of life in contact and also destroys the different habitat elements of countless species in the marine ecosystem.
 - *Purse Seining and Night Fishing*. Although banned under the Philippine Fishery Code of 1998, fishermen still use super lights employed by commercial vessels to attract fish. Super lights brighten the horizon at night near many beaches and disturb the nesting process of the adult female turtles. Hatchlings are more affected as they are attracted to lights, which draw them off course from their normal dispersal in the open sea and get caught in the fishing operation.
 - *Unregulated rituals as practiced in Kei islands*. Local people believe that their ancestors require them to hunt turtles for their ritual ceremonies. Each season, approximately 100 leatherbacks are captured by the villagers and this annual mortality is too high for the survival of the species.
 - *Beach Development*. One of the pressures in the Turtle islands is population growth and influx of settlers due to the peace and order situation in some parts of Mindanao. Housing structures and other facilities reduce the area of sandy, undisturbed beach available for the turtle to nest.
 - *Egg Collection*. Collection and trade of turtle eggs is a tradition in the region. While egg collection is strictly prohibited in the Baguan Island Marine Turtle sanctuary, 60% of the egg production in the five other Philippine Turtle Islands is legally harvested for local trade and consumption.
- Lights in the shore scare them away and keep them from climbing the beach.
 - Huge logs in the beach may block their way, preventing them from finding a suitable place to dig a nest.
 - Pregnant turtles are also slaughtered.

As a result of all these combined threats, the Philippines and Malaysian governments recognize that effective conservation efforts can not be independently realized at the national level and that bilateral efforts are necessary to ensure the long-term survival of marine turtles in this region.

10.5 Changes in International Cooperation for Protection and Conservation of Marine Turtles

The Philippine Government is a signatory member of several international agreements, treaties and environmental instruments, including the older treaties such as the Association of Southeast Asian Nations (ASEAN 1967) and the 1969 Vienna Convention on the Law of Treaties (VCLT signed in 1980), the Convention on Biological Diversity (CBD 1992), the International Tropical Timber Agreement (ITTO 1994), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). These agreements cover wide range of concerns from trade, security, international laws and sustainable management of the world's diverse flora and fauna including marine resources.

Over the years, the marine resources conservation and protection are becoming more politically, legally and ecologically complex. Countries affected are finding the necessity to take a broader look at their natural resource base and consider the full range of ecosystem processes that provide and sustain those resources. This holistic view of ecosystem management requires more coordination between different agencies, stakeholders, and governments who must work across jurisdictional boundaries.

Recognizing the importance of collaborative management for borderless marine species, the Philippines government entered into agreement with neighboring countries to jointly address the problems and issues of common marine resources particularly the marine turtles. Shifting from a unilateral approach to manage common goods, the country inked three international agreements since 1996. These agreements are between Philippines-Malaysia; Philippines-Malaysia-Indonesia; and Philippines-Other Twenty-Seven signatory member states of the Indian Ocean-Southeast Asian Marine Turtle Memorandum of Understanding.

Philippines-Malaysia: Turtle Islands Heritage Park Area (TIHPA, 1996)

As seen earlier, the Turtle Islands are major rookeries for green and hawksbill turtles in Southeast Asia. Both countries who own the islands agreed that they need to be treated as one management unit, even though both set of islands are

protected independently under each individual country's legislation.

Facilitated by the World Wildlife Fund for Nature (WWF), the two countries signed a bilateral agreement in 1996 establishing the Turtle Islands Heritage Park Area (TIHPA). The general purpose of the agreement of this first trans-boundary protected area for marine turtles is to jointly manage and protect the traditional nesting area of the green and hawksbill turtles. Since the species do not recognize boundaries, the protection of the remaining major green turtle habitats and population in the Southeast Asian region can only be achieved through a unified approach of the management goals and strategies.

The islands remain to be managed by their respective country authorities but under a uniform set of guidelines developed by official representatives from each of the two countries. Specifically, the two countries sought to: implement an integrated and uniform approach to conservation and research that is oriented towards wise management of the TIHPA, establish a centralized data base and information network on marine turtles, develop appropriate information awareness programs primarily targeted towards the inhabitants of the Turtle Islands on the conservation of marine turtles and protection of their habitats, and jointly implementing the marine turtle resource management program.

The two major programs include: a) marine turtle conservation and management, and b) research and monitoring. The former consists of nine components: 1) protection of nesting habitats; 2) prohibition of sand and coral excavation; 3) protection and rehabilitation of beach vegetation; 4) beach clearing activities; 5) protection of adult turtles; 6) prohibition of the use of fishing gears contributing to the mortality or disturbance of turtles within the TIHPA; 7) screening of lights from buildings; 8) protection from pollution that might endanger turtles; and 9) formulation of a Joint Management Plan for the TIHPA. There are eight components under the research and monitoring program: 1) population status and distribution; 2) turtle harvest management; 3) dynamics of turtle egg trade; 4) DNA analysis; 5) sex ratio determination in ex situ hatchling; 6) tagging of turtles; 7) joint resource and ecological assessment; and 8) joint socio-cultural economic and investment opportunities assessment. An important provision of the agreement includes the creation of a joint management committee composed of five members from each contracting parties whose functions are:

- Serve as the policy-making body of the TIHPA;
- Coordinate/collaborate with international organizations involved in marine turtles conservation for the realization of the purposes of the agreement;
- Study and recommend to their respective authorities the enactment of such laws as may be necessary;
- Formulate a sustainable financing strategy;
- Render periodic reports to the Philippines-Malaysia Joint Commission for Bilateral Cooperation.

Philippines-Malaysia-Indonesia: Sulu-Sulawesi Seascapes (2003)

Noting that large-scale and sustainable development of natural marine resources can only be realized through collaborative management among concerned government agencies and other stakeholders in border states, the cooperation expanded in 2003 to include a third country, the Government of Indonesia. The area coverage expanded to include the Sulu-Sulawesi seas and the marine species to be protected, develop and conserved were not limited to the marine turtles of the three countries only. A Memorandum of Understanding (MOU) was signed by the three countries in 2004 and the conservation plan for the Sulu-Sulawesi Marine Ecoregion (SSME) was adopted.

The Sulu-Sulawesi seas are a vast maritime area of 900,000 square kilometers hemmed in by coastlines belonging to the three nations with a shared culture and history. The seas are coveted as among the world's most diverse and productive marine ecosystem. Situated in the heart of what marine biologist called the coral triangle, the Sulu-Sulawesi seas have the world's highest concentration of marine biodiversity.

The seascape is noted to be the home to a wide variety of marine plants and animals. These range from sea-grass meadows, mangrove forests, coral reefs, marine fishes, dolphins and whales, sharks and rays, marine turtles, and other less known but equally important plants and animals. According to Conservation International Philippines, the Sulu-Sulawesi seascape is home to more than 400 species of algae, 16 species of sea-grass, over 400 species of corals and 650 species of reef fishes, including unusual fishes such as coelacanth, a pre-historic fish once thought to be extinct.

The entire area has a population of around 35 million people who benefit from the vast ocean wealth through fishing, agricultural production, tourism and even mining. The unabated population growth has given rise to destructive fishing practices that threaten the marine ecosystem where millions of people depend for their livelihood and food.

The understanding recognized the following:

- The states exercise sovereign rights over their natural resources but cooperation is important for the conservation and sustainable development of these resources, especially for areas beyond national jurisdiction but of mutual interest, in line with the provisions of the Convention on Biological Diversity (CBD) including the Jakarta Mandate of 1995;
- The relevant provisions of the United Nations Convention on the Law of the Sea (UNCLOS) of 1982, particularly Part IX thereof relating to enclosed and semi-enclosed seas encourage cooperation among regional states, and other interested states in marine environment protection and marine scientific research;
- The outcome of the World Summit on Sustainable Development (WSSD), in particular, the Johannesburg Declaration on Sustainable Development and Paragraph 29 of the Plan of Implementation states that effective coordination and cooperation at global and regional levels, among others, are needed to ensure sustainable development of the oceans;
- The SSME is significant as a globally unique center of biodiversity with a vibrant ecological integrity, including species assemblages, communities, habitats and ecological processes;
- The SSME is a highly productive ecoregion that can sustainably and equitably provide for the socio-economic and cultural needs of the human communities dependent on it;
- The shared resources of SSME are a common concern, and the conservation and sustainable development of said resources and the benefits are mutually shared among the parties;
- The ecoregion approach to the conservation of the four fundamental goals of biodiversity conservation, which are representation, sustainability of ecological processes, viability of species, and resiliency.

Marine Turtle Conservation Emphasized in the SSME

WWF promoted an ecoregion approach to marine resource protection and conservation was active in the Derawan Island group in East Kalimantan, Indonesia. The Derawan Islands, East Kalimantan are known for their marine green turtle abundance. There are more than five thousands females nesting annually in the islands. The importance of the Derawan Islands therefore resembles that of the Turtle Islands for marine turtle conservation. The different stakeholders who prepared the SSME conservation plan noted this similarity and in February 2004 meeting, the three governments signed the tri-national conservation plan that recommends the development of an action strategy for the management of marine turtles in particular, and the establishment and implementation of a system of marine protected areas within the SSME.

Aside from the Derawan Islands, other areas in Indonesia harboring marine turtles that need protection are the Rei Islands group, where leatherback turtles are very important species for the local people's subsistence needs. Known as *tabod* in the area, more than 100 turtles are captured each season. Also, the waters off Fiji are important foraging grounds for marine turtles. It is possible that marine turtles from the different countries visit to forage in this area, as turtles travel thousands of kilometers per year. In Bali, there is an intensive green turtle trade for human consumption as about 20,000 specimens were traded between 1969 and 1994. This figure is outside of the five thousand set aside as quota for religious purposes.

Philippines and Other Twenty-seven Signatories of the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and Southeast Asia (2001)

Signed on June 23, 2001 in Manila a memorandum of understanding was concluded under the auspices of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) anchored on several developments related to biodiversity conservation in general and marine turtles in particular. The membership remains open for signature indefinitely for subsequent States, and will come into effect for those States on the first day of the third month after their signature. As of July 2007, there are 27 signatory member states of this multi-lateral understanding on marine turtle conservation. Among others, the MOU was based on the common grounds adhered by and among the signatory states such as the signatory states being aware that the populations of the six species of the marine turtles of the region are listed as vulnerable, endangered or critically endangered by the IUCN Red List of Threatened Species.

In the last decade, agreements changed from bilateral to multilateral participations not just on marine turtle conservation but also for other marine species. Other changes involved the expansion of management and conservation

approaches. It grew from species to ecosystem, from regional scale to an ecoregion scale, and from a defined protected area to a corridor of interconnected protected areas with the end view to conserve the full range of biodiversity in the region that is home to threatened marine species including the turtles.

10.6 Changes in Philippine National Policies towards Marine Turtle Conservation

Historically, marine turtle conservation has been well recognized by the government. Legislative support already started in 1932. Republic Act No. 4003 issued in December 5, 1932 and amended in August 31, 1940 completed the laws regulating fish and other aquatic resources of the Philippine Islands. Laws related to marine turtle conservation include the Fisheries Administrative Order No. 23 issued in July 26, 1948 which established a closed season period for the conservation of turtles and regulated turtle eggs and shell collection in the turtle Islands. This was followed by Fisheries AO No. 29 dated April 28, 1951 establishing the rules and regulations governing the gathering of aquatic turtle eggs.

In 1979, through Executive Order No. 542 dated June 26, 1979, the *Pawikan* Task Force was created with regular funding and its implementing rules and regulations was issued the following year. The conservation efforts was widened when a Ministry administrative order (MNR) No. 12 series of 1979 set regulations for the conservation of marine turtles in the Philippines. As early as 1982, an order was made to conduct inventory and marking of turtle stocks through MNR special order no. 98. Despite all these legal issuances, marine turtles however were still not fully protected. Hence, an order was issued in April 29, 1982 suspending all the permits on marine turtle exploitation followed by another MNR order establishing marine turtle sanctuaries in the provinces of Tawi-tawi, Palawan and Antique. There were also issuances deputizing conservation officers including governors, vice governors, municipal mayors and barangay captains being deputized through various MNR orders until 1983.

National Policies in the Nineties. The Philippine national government passed several national laws and department orders before and after entering into an agreement with countries interested in marine turtle conservation efforts. Foremost are the Republic Act 7586 (NIPAS Law of 1992), and the Republic Act 7160 also known as the Local Government Code of the Philippines.

Republic Act 7586 (NIPAS Law, 1992). Recognizing the critical importance of protecting and maintaining the natural biological and physical diversities of the environment to sustain life and development, the Philippine congress passed into law the National Integrated Protected Areas System (NIPAS) in 1992 also known as Republic Act 7586. The law encompasses outstanding remarkable areas of biologically important public lands that are habitats of rare and endangered species of plant and animals, biogeographic zones and other related ecosystems, both terrestrial and marine, all of which shall be designated as protected areas. The Act was signed into law by President Aquino on June 01, 1992. Section three of R.A. 7586 established at least seven categories of protected areas that include: strict nature reserve, national park, natural monument, wildlife sanctuary, protected landscape and seascape, resource reserve, natural biotic areas and other categories established by law, conventions or international agreements of which the Philippine Government is a signatory.

Among the ten priority sites included in the implementing rules and regulations of the NIPAS act, Turtle Islands is one of them. This accelerated the procedure of declaring the area into a sanctuary. The rest of the priority protected areas are: 1) Northern Sierra Madre natural park, 2) Batanes protected landscape and seascape, 3) Subic-Batan natural park 4) Mt. Apo natural park, 5) Apo Reef natural park, 6) Mt. Kanlaon natural park, 7) Siargao Islands protected landscape, 8) Agusan marsh wildlife sanctuary, and 9) Mt. Kitanglad range natural park.

The Local Government Code of 1991 (RA 7160). The move towards greater people empowerment through decentralization efforts started in 1991 with the passage of Republic Act 7160 commonly known as the local government code of 1991. The law devolved the political power, responsibility, functions and provisions of services to local government units (LGU). Among the functions devolved by the national government to the local government units is coastal resource management. One of the inherent functions of LGUs is rural coastal development which includes municipal waters within 15 kilometers of the coastline. LGUs are authorized to pass local resolutions and enact ordinances that would strengthen implementation of national laws. Delineation of coastal areas to be protected and community-based coastal resource management with the people's organization is one significant impact of the law. LGUs are also authorized to issue licenses and collect fees from any activities within their municipal jurisdiction.

Policy Supports after 1996. In terms of laws, Philippines is not behind with other countries, however, it seems those are not enough. Several laws and related policies were enacted that directly or indirectly support the management, protection and conservation efforts on marine resources conservation and in compliance too with the government's commitments to international agreements.

Republic Act No. 8550, The Philippine Fisheries Code of 1998. The primary mandate for aquatic resources management was further defined by the enactment of RA 8550 which became effective on 23 June 1998. It is a product of concerted efforts by different non-governmental organization (NGOs) and peoples organization (POs) working in fishing communities. The law provides new concept, such as: 1) limitation of access using scientifically determined procedures, 2) integrated management consistent with the enter-LGU cooperation as articulated in the local government code, and 3) enhanced and institutionalized participation by the community through the various levels. The code largely clarified issues pertaining to the extent of LGU jurisdiction in municipal waters and operation of commercial vessels. Another important provision of the code is setting aside fishery refuge and sanctuary where fishing or other forms of activities which may damage the ecosystem of the area are prohibited and human access maybe restricted.

Presidential Proclamation of Turtle Islands as Wildlife Sanctuary in 1999. On August 26, 1999, a presidential proclamation No. 171 upgraded Turtle Islands into a Wildlife Sanctuary from its original classification as among the ten priority sites under NIPAS Act of 1992. The seven small islands covering a total of 242,967 hectares of both land and water are covered by the proclamation. As a result, the formation of people's organizations was enhanced, LGU and NGO collaboration was accelerated and funding support from international organizations increased. The interim protected area management board was created and a management plan of the sanctuary is now in place. Efforts are consolidated to convert the proclamation into a law to access more regular funding from the government.

Republic Act 9147 (Wildlife Act of 2001). A follow up law of the NIPAS Act was signed by President Gloria Macapagal-Arroyo on July 30, 2001. Among others, the major provisions of the law are the increase in penalties for violators of the act such as illegal trading of wildlife, introduction of exotic species, bioprospecting, and delineation of powers between the Department of Environment and Natural Resources (DENR) and the Department of Agriculture (DA) where marine turtle management is put under the jurisdiction of the DENR. It also empowers the DENR secretary to designate critical habitats outside of the NIPAS if threaten species are found in coordination with the local government units and other stake holders of the area.

Verde Passage (2006). On November 8, 2006, an executive order was issued to create protected areas in the Verde Passage, known as the "center of the center" of the world's most plentiful shore fish region located at the apex of the coral triangle that includes the Philippines, Malaysia, Indonesia and Papua New Guinea. Verde Passage is a critical corridor that is vital to marine based tourism, transportation and international shipping. It is the recent or fourth area added to the Marine Biodiversity Conservation Corridors (MBDCC). The first three are the 1) Cagayan Ridge Corridor, in the middle of Sulu Sea, including the Tubbataha reefs, declared by UNESCO as a World Heritage Site; the 2) Balabac Strait in the southern tip of Palawan; and the 3) Tri-National Sea Turtle Corridor, which includes Sabah in Malaysia, the Turtle Islands in the Philippines, and east Kalimantan.

10.7 Roles of Different Stakeholders in Transborder Settings

As been said time and again, conservation is a mandate to all. As experienced in the conservation plan formulation of the TIHPA and SSME, there were various NGOs, POs, Clubs, government agencies, associations, academic institutions, councils, LGUs, business chambers of commerce, foundations, cooperatives, lawyers group, commissions, resorts owners, individual scientists and the local people that have contributed to the preparation of transborder conservation plans.

Government Agencies, People's Organizations and Non-Government Organizations

As of May 31, 2005, there are more than 3.3 million hectares of land and water declared or proclaimed as protected areas in the Philippines. The government at the different levels and the different stakeholders on marine turtle conservation as well as the other marine species, collaborated, combined resources both technical and financial, shared information and join hands in generating research data to attend the objectives of the bilateral and multilateral agreements.

Although the lead agency mandated to protect marine turtles and its habitats is the Department of Environment and Natural Resources (DENR), the national government recognizes that to succeed in this endeavor, it requires the concerted efforts of all individuals or groups. Under the present laws, the government empowers communities to protect, manage and conserve natural resources including marine turtles.

In the entire country, hundreds of people's organizations (POs) contracted by the government with the assistance of local and international non-government organizations (NGOs) are in place. This is under the community-based coastal resource management program. At present there are hundreds of POs covering more than 1.5 million hectares with thousands of beneficiaries participating. The agreement is signed by at least the PO, the local government units (LGUs), NGOs and the DENR. In most cases NGOs assist in the capacity building of the POs by providing the necessary trainings on the different needs of the organization in managing the organization and its resources. These NGOs got funding from international and bilateral donors, governments, and foundations among others. One of the obligations of the POs is to protect and conserve wildlife species considered as endangered including their habitats and this includes the marine turtles.

Among the prominent international NGO's working with the POs are the WWF with its local counterpart, the *Kaban ng Kalikasan ng Pilipinas* (KKP) and Conservation International (CI) Philippines. The DENR has agreements with these international NGOs for financial and technical supports for its programs in protected areas. In particular, the KKK has a MOA with the DENR for the Turtle Islands Integrated Conservation and Development Project since 1996. CI Philippines together with other NGOs also inked agreements to assist in the implementation of the Sulu-Sulawesi marine triangle conservation and development activities. In all cases, the significant role of the NGOs was to initiate and facilitate the formulation of trans-boundary agreements where the Philippine government is a signatory. In addition, they also provided technical and the much needed funding support in the planning of the conservation plan.

Indigenous Peoples

Throughout the archipelago, the Turtle Islands and that of its turtles are distinctly managed by the indigenous peoples that lived in these islands for centuries. These are the native *Tausugs* that dominate the more than 3,000 people living in the five islands. The next native ethnic group found in the islands is called the *Jama Mapuan*. Both groups are known to have co-existed harmoniously with the population of marine turtles for centuries. With their traditional knowledge intact, they have actively engaged in the protection efforts of both the turtles and the surrounding areas. As such they are represented in the regional Protected Area Management Board (PAMB) of the DENR, which is a multi-sectoral policy-making body of the park or sanctuary. Other members of the PAMB include representatives from the concerned national and local government agencies, NGOs, POs, media group and other community sectors.

Business Sector

Since turtles are important market commodity, some businesses thrive in the sustainable supply of marine turtles. Businessmen prefer alive turtles which have more value than dead ones. Ecotourism along coastal resorts that offer scuba diving and snorkeling are some of the favorite activities in the Philippines makes use of live turtles as one of their attractions offered by resort owners to tourists. Signatory members of the agreement help marketing the products.

International Donors

International funding agencies have significantly contributed in the plan formulation of the conservation plans in marine transborder areas in the Philippines including the SSME conservation plan. With the big expanse of the area, many donor groups such as David and Lucile Packard Foundation, United States Assistance for International Development, Mc Arthur Foundation, Henry Foundation, Homeland Foundation, WWF United States, and Global Environment Fund of the United Nations Development Program funded the preparation of the SSME conservation plan.

10.8 Effectiveness of Cooperation Agreements and Instruments in Marine Turtle Conservation

Constraints to Turtle Conservation

After several years of joint collaboration in conserving the marine turtles and its habitats, the monitoring aspect has

been intensified and more reports of illegal exploitations of turtles have come to the open. Most recent cases were reported in Philippine waters:

- Over 100 dried, butchered, and live marine turtles and some 10,000 turtle eggs have been seized from a Taiwanese vessel while 19 of its crew members were detained for allegedly poaching off Turtle Islands in Sulu last September 2, 2007. Authorities said at least 50 dried, 58 freshly butchered, and 28 live marine turtles known as pawikan, were found on the boat intercepted by a coast guard near the Taganak Island, the largest among the Turtle islands in the Sulu archipelago. According to WWF a total of 220 adult turtles were killed and 10,000 eggs were collected by the fishermen. A WWF Tawi-tawi project manager said this incident is not the first time. Again, in December 2007, Chinese fishermen on board the M/V Hoi Wan fishing boat were caught poaching off the Tubbataha reef. Also earlier, 24 Chinese fishermen aboard the M/V Kwok Wai Ming were caught poaching off Mingsee islands in Palawan, Philippines (Philippine Daily Star September 6, 2007).
- Philippine authorities (Navy and Coast Guard) caught Chinese poachers with slaughtered and processed hawksbill marine turtles off the waters of Balabac Strait. These poachers sometimes enter Malaysian or Indonesian waters to avoid capture by Philippine authorities, which emphasizes the need for transborder security patrol and cooperation (Business Mirror, June 6, 2007).
- In April 2007, Malaysian authorities seized tens of marine turtles from a China fishing trawler which had encroached the waters of Sabah. This is concrete evidence that turtle meat is in high demand in the international market (Indian Ocean SEA Turtles.org/headline, August 13, 2007).
- In March 26, 2007, a Chinese fishing boat carrying 72 mixed green and hawksbill turtles was apprehended and six people arrested off northern coast of Borneo. Three days later, more poachers were caught red-handed with large cargo of 220 green and hawksbill turtles.
- In Nov. 30, 2005, the Philippines coast guard found and confiscated nine sacks of turtle shells and 23 sacks of dried sea horses in a 20-ft. container van ready to be shipped to Vietnam. The cargo was declared only as sea cucumbers.
- The WWF reports said that 900 foreigners have been arrested for the past 9 years for poaching in Philippine waters. More than 600 of these poachers were coming from China.

Policy Implications and Lessons Learned

Transborder cooperation agreements and instruments provided legal basis for action, creating space to develop a conservation plan between and among border-states and implement them. It forced governments to give priority actions to the plan and honor commitments and speed up government support. Two or more countries may be at different stages of economic development and hold incompatible policies related to resource utilization versus resource protection, but with cooperation agreements these differences can turn into positive outcomes. For instance, in the case of the TIHPA, the long territorial dispute between Malaysia and the Philippines over the latter's claims on Sabah since the sixties have been toned down and might be considered a peaceful move to resolve the dispute. Transborder agreements for joint conservation may reduce tension between countries with historical differences caused by territorial claims.

Some lessons learned from the Philippine experience from the three trans-border agreements/understanding discussed here are:

- The need to localize the provisions of the agreement and not only the national government agency implementers should know what is happening in the area of implementation;
- The unabated exploitation of marine resources is committed mostly by the Chinese who are not part of the cooperation agreements, hence dialogue with Chinese-Taipeh should be considered to join the collaboration or through other conservation instrument;
- Policing and imposing penalties for violators who are citizens of the signatory parties requires a second look;
- Differences in religious and cultural practices of citizens of signatory countries should have been threshed out first during the negotiation period so that both parties can suggest measures that reduce the negative impacts of the conservation instruments;
- Wealthy countries must consider providing assistance to poorer countries to increase access to funding support.

10.9 Concluding Remarks

Increasing interest arose in recent years in transboundary protected areas especially in the southern Philippines, including the Turtle Islands and the Sulu-Sulawesi seascape for a variety of environmental, economic and political reasons including the need for more effective management of shared ecosystems. This interest has led to transborder cooperation agreements, specifically to conserve the critical, and endangered marine turtle species. The transboundary habits of the marine turtle species make actions for conservation sometimes extremely difficult. Apart from political will, the lack of technical capacity, funding, and obvious difference in terms of preparedness at the national and local levels have affected conservation activities. Constraints to conservation still exist including poaching of marine turtles by parties not belonging to signatory countries. Differences in cultures, traditions, and management capabilities still impair management effectiveness. To move ahead, the signatory countries must continue to tap the needed institutions, partners and intellectual and financial resources available within international communities.

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The Wadden Sea Conservation Area: Cooperation and Competition in an International Coastal Zone

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Abstract: The Wadden Sea is an extensive coastal zone of about 14,700 km² that stretches from the northern part of the Netherlands, through Germany to Denmark. The area consists of a large number of relatively small islands, and extensive tidal flats that separate the islands from the mainland of the three countries. The tidal flats in particular are important for migratory birds that forage on the shallow flats. The area also harbors an important population of seals. In addition to the biodiversity value of the Wadden Sea, various types of fisheries, tourism and military activities compete for space and resources. Moreover large amounts of natural gas were discovered under the Wadden Sea and the potential exploitation of these gas fields has been a topic of heated debates between nature conservationists, mining companies and politicians. Some German and Dutch harbor cities are located on the mainland but need to pass through Wadden Sea before they reach the North Sea. Access to these harbors needs to be assured by dredging in order to allow ships of ever growing size to reach their destination. As a result of new aspirations of the harbors of Delfzijl, Bremen and Hamburg increased movement of ships have also added to the pollution problem in the Wadden Sea. Part of the area is still contested between the Netherlands and Germany. Moreover these harbors are also competing amongst themselves on the transportation sector. As a result of competing claims from stakeholders in the three countries, and the problems to solve them separately, Denmark, Germany and the Netherlands have decided to meet on a regular basis. Every three years designated authorities from the three countries meet searching for common ground in the management of the shared ecosystem. The Netherlands and Germany have jointly decided to propose the Wadden Sea Conservation Area as a World Heritage Site within the UNESCO system. The paper describes the international management of the Wadden Sea and its problems as a result of its multiple functions and values which generate alliances of cooperation as well as forms of competition.

11.1 Introduction

In 1978 Denmark, Germany and the Netherlands established the first non-legally binding international agreement on the protection of the Wadden Sea, a chain of islands, dunes and tidal flats that stretches along the northern coast line of the Netherlands, through Germany and Denmark. It is Europe's largest marine wetland and an area of outstanding international importance. The initial commitment was 'to guarantee the natural functioning of the ecosystem through the proper regulation of human activities'. In 1982 the three nations adopted a joint declaration committing them to expand their contacts between responsible administrations and to coordinate implementing actions on the protection of seals, waterfowl and their habitats. At the same time a joint declaration was adopted that until today remains the political foundation for the cooperation even though numerous measures have been added by the declarations of each of trilateral governmental conference held every two to three years. In this joint declaration the three governments declared:

- To consult each other in order to coordinate activities and measures to implement the above-mentioned legal instruments [Ramsar, Bonn and Bern Conventions and relevant EU Directives especially the Birds Directive] with regard to the comprehensive protection of the Wadden Sea region as a whole including its fauna (marine, terrestrial; and avian) and flora with special emphasis on:
 - resting and breeding areas for seals
 - areas being important as resting, feeding, breeding, or molting grounds for water fowl, both in themselves and in their interdependencies.
- To this end to intensify and broaden the contacts between their responsible administrations. The results of these consultations will be examined and, as appropriate, decided upon at Dutch, German-Danish meetings on governmental level about the Wadden Sea.

(The Joint Declaration of the Protection of the Wadden Sea, 1982)

The declaration and cooperation have provided a pioneering model for the protection and management of a trans-

boundary ecological system of international importance. What did almost thirty years of transboundary environmental concern over the Wadden Sea bring in terms of real cooperation and actual protection for the area? What are the challenges ahead for this cooperation? Before looking into these questions, I shall first give an outline of the ecological and cultural significance of the area.¹

11.2 The Ecology of the Wadden Sea Region

The Wadden Sea is a coastal wetland of exceptional size, one of the largest in the world, of great beauty and rich in unique natural assets. The coastline distance from the Skallingen peninsula in Denmark to the Den Helder peninsula in the Netherlands is about 500 km. The distance between the seaward and landward boundaries is up to 150 km in the estuaries but the average is about half of that. The entire Wadden Sea, including its off shore parts, is about 14,700 km² that comprise a maritime zone of flat land to shallow waters. The transitional zone between sea and land has been continuously shifting in size, shape and position over the last 16,000 years. It contains the largest coherent tidal flat in the world.

Table 11.1. Geomorphological parts of the Wadden Sea – land and seascape transition

Geomorphological region	Area (km ²)
Salt marches	400
Intertidal sand and muds flats	4,700
Subtidal flats and gullies	3,700
Islands and dry sandy shoals	1,000
Offshore area (to about -15m depth-line seaward of the islands)	4,900
Total Wadden Sea Area	14,700

Source WHNPG/CWSS 2007: 17

The Wadden Sea is a gigantic coastal filter and an area of high biotic production and migrating animals. People have been living in the Wadden Sea region since its formation as a distinctive landscape. Early settlers in the marshes built mounds to live on. Later, they claimed land by separating marshes from the sea with earthen walls and dikes. The area is divided into three subregions:

1. The Southern Wadden Sea that extends from the Marsdiep tidal inlet in the west to the Jade inlet in the east. Twelve islands form a seaward sandy barrier against waves generated by the northern and western winds. A large bay, the former brackish Zuiderzee (3,600 km²) was once part of the Southern Wadden Sea but was separated by a dike in 1932 and has since become a freshwater lake and agricultural land. Another bay, the Dollard in the Ems estuary, still exists.
2. The Central Wadden Sea extends from the Jade inlet into the Eiderstedt peninsula and has three major estuaries: Weser, Elbe and Eider. Across the Eider estuary a storm barrier has been built. Salinity is lower and more variable in the central sub-region than in the others, while tidal range is higher.
3. The Northern Wadden Sea extends from the Eiderstedt peninsula in the south to the Skallingen peninsula in the north. Eight islands and high sand bars form a seaward barrier some five to 25 km off the mainland coastline and provide shelter against the waves generated by the prevailing westerly winds. Several marsh islands are scattered across the tidal area and are remnants of a coherent marshland which inundated in medieval times. Large estuaries are absent (WHNPG/CWSS 2007: 18).

Natural rock formations do not occur in the Wadden Sea. Sediments prevail throughout the region. The sand of fluvial and glacial origin is redistributed by currents and waves in the North Sea. The fine clay fractions in the sediments are thought to be primarily derived from riverine sources. Because of the prevailing southwest to northeast current in the North Sea, water masses from major discharging rivers pass by the Wadden Sea. Over the course of the centuries these

1. There is an abundance of literature ecological, environmental and cultural literature of the Wadden Sea. For this paper extensive use was made of a number of publications including the 'Nomination of the Dutch German Wadden Sea Conservation Area as World Heritage Site (WHNPG/CWSS) and official evaluation report of the trilateral cooperation (Moser and Brown 2007). In addition field visits were made to a number of Dutch Wadden Islands in the course of 2007.

currents have formed the islands and the tidal flats (Imares 2007). The existence of tidal basins is interrelated with the existence of barrier islands or sand banks. Between the islands, the tidal flow is compressed, forming tidal inlets of more than 50m in depth with very strong currents. Behind the barrier islands there are smaller gullies and tidal creeks. Sand and mud are being transported continuously and heavy storms change the shape of sand banks and tidal flats. Islands have also moved over longer periods of time. Because of erosion caused by the prevailing southwestern winds, they loose sand on the west side, but this is deposited again on the eastside of the islands. Governments have tried to stop these islands from 'walking' by dike building and re-enforcement of the dunes (tree and shrub planting). Wind also contributes substantially to the conditions in the Wadden Sea. Strong northwestern winds may add additional water masses to the movement of the tides on the tidal flats. Extensive molluscan shell beds can be found on some places but in general there is no hard substrate in the generally soft sediment environment.

In estuaries and landwards, salt marches grade into brackish and fresh water reed marshes which have also led to some peat formation. These peat layers have been excavated since medieval times to serve as fuel after drying. The peat excavations lowered the terrain and during storm tides the peat mining areas inundated again. A new phase of marine deposits started all over again. In general the Wadden Sea region provides a multitude of transitional habitats with tidal channels, sandy shoals, seagrass meadows, mussel beds, sandbars, mudflats, salt marshes, estuaries, beaches and dunes.

The offshore belt is usually defined as the seaward zone connecting the barrier islands and the high sea sandbars, and extending into the North Sea down to a 15m depth contour. This belt has no tidal flats and drops off rather smoothly towards the open sea. The offshore belt has an area of about 6,000 km² and varies in width between 10 and 25 km in the Southern Wadden Sea. In the Central and Northern Wadden Sea this belt is wider and varies between 20 and 50 km. The most important function of the offshore belt for the tidal area is its role as a spawning site for shrimps and other biota. Their larvae become transported into the tidal area and grow up under highly nutritious and warmer conditions in spring and summer. For many fish and invertebrates the offshore serves as a refuge area during winter time when water temperatures in the tidal area become colder than the sea water.

The tidal flats are extensive areas with mud, numerous runnels, creeks and deep gullies. The sediment surface is covered by microscopic algae and lugworms. Snails graze on these algae, while they themselves become prey to crabs, shrimps, fish and birds. There are also extensive mussel beds in the Wadden Sea even though there is hardly any hard substrate. In the Wadden Sea mussels usually attach to each other thereby forming aggregations which can resist being moved too easily by waves and currents. They may form aggregations of 1,000 to 4,000 mussels per m². The mussels can be very important for the breakdown of organic matter. The mussel population has suffered heavily from the invasion of the introduced Pacific oysters, which have invaded mussel beds.

The relevance of the Wadden Sea region as a conservation area is to a large extent determined by the huge populations of birds breeding, staging, molting and wintering in the area. The availability of food and the relatively low level of disturbance are the essential factors. For over 40 species the Wadden Sea supports more than one percent of the flyway populations which is the criterion of the Ramsar Convention as an officially recognized wetland of international importance. Of these bird populations, four are breeding birds, 24 are breeding as well as migratory species and 15 use the Wadden Sea only during their seasonal migrations. Of all migratory birds, 29 species occur with more than ten percent of their flyway population in the Wadden Sea. Various species of gulls dominate the breeding populations. For many migratory species the Wadden Sea Region is important as a refueling region for birds breeding in Arctic North America or Arctic Asia. Two subspecies of Knot for instance have very different habits; one breeds in Greenland and Canada and winters in the Wadden Sea, while the other breeds in Siberia and winters in West Africa. These birds only stay two relatively short periods in the Wadden Sea region before continuing take off to their final destinations.

Large populations of geese and ducks are also to be found in this area. For some species, like the shell duck and eider duck the Wadden Sea region is their major home. Both species lose their flight feathers and are completely flightless for some weeks. They highly depend on the vast and undisturbed tidal flats for their survival.

Without the Wadden Sea, several bird populations would be endangered or even lost. Although bird migration is a global phenomenon that can not be associated with a single site, the Wadden Sea plays a vital role in this migration movement and is for this reason to be considered as a 'mega-site' for bird migration. It is an indispensable stopover.

There are three kinds of marine mammals in the Wadden Sea: the harbor seal, the grey seal and the harbor porpoise. In the past all species were heavily hunted for meat but also to reduce the number of seals as competitors for

fish. Ever since the 1970s however hunting is no longer allowed and the seal has become the gentle symbol of the Wadden Sea to many people in the three countries. As a result of the decline in hunting pressure seals are abundant in the Wadden Sea and relatively easy to observe while sun bathing on the tidal flats or sand banks. The seals are a major attraction for tourists. In 2006 more than 15,000 harbor seals were counted compared to about 4,000 some 30 years ago. The population has successfully survived two severe attacks of virus diseases in 1988 and 2002. The harbor porpoise population has been established to comprise more than 200,000 individuals.

More than 100 species of fish have been recorded in the Wadden Sea. Most of them are North Sea or even oceanic species which visit the Wadden Sea but do not depend on the area. For some species like whiting and cob, the Wadden Sea is extremely important though. Large numbers of juveniles invade the Wadden Sea during later summer and autumn. In the past sturgeon and salmon were important species too but because of overfishing and degrading river habitats their numbers have rapidly declined. Reduction of fishing intensity and reintroduction with improvement of river habitat quality might have positive effects in the long run. Sea trout, smelt and twaid shad are also important species that live permanently in the Wadden Sea. Eel larvae are transported to the Wadden Sea by the currents of the Atlantic water. They migrate into fresh water until they reach maturity. Juveniles are found to stay in the Wadden Sea during a large part of their life.

For all kinds of fish the Wadden Sea's major function is that of a nursery. Eggs, larvae and juveniles are brought to the Wadden Sea by the currents. They profit from the warm conditions and the abundant food on the mud flats. Some important species are the flatfish plaice, sole, herring and sprat.

With respect to its plant life, the Wadden Sea also harbors an enormous diversity of plants like herbs, grasses, marsh plants, and sea grasses. In combination with the other populations of organisms and animals, and the ecological conditions and the movement of wind and water, the Wadden Sea Region can function as a gigantic coastal filter, and producer of food to numerous animals (Abrahamse 1977; WHNPG 2007).

11.3 The History of Resource Use in the Wadden Sea Region

It is assumed that the Wadden Sea region has been occupied and used by Neolithic and Mesolithic hunters and gatherers. Permanent settlement was only possible on the higher grounds and on the banks of the rivers Weser, Elbe and Ems, evidenced by graves and artifacts found at various locations. Collectively raised mounds from sods and dung were built in the marsh lands to keep settlements dry even during heavy storms.

Starting from the ninth century onwards the coastal landscape was increasingly transformed by drainage and conversion. Salt marshes were protected by dikes and retained the salt water, and as a result salt making became an important industry. Around 1500, life in the Wadden Sea region became more secure. Larger and stronger dikes were built to withstand the heavy storms which must have made thousands of victims in earlier times. Agriculture could be intensified due to extensive drainage. At the same time shipping, fishing and whaling became increasingly important as ships started to become bigger and navigation methods more sophisticated. Numerous harbors developed into trade centers along the coastline even though the area was difficult to navigate because of the numerous sandbanks, deep gullies with strong currents and the ever changing sedimentation and erosion process.

Many men from the Wadden islands joined whaling ships on long and distant trips when whaling was still a big industry in the Netherlands. Particularly in the early days of whaling during the 17th and 18th century numerous sailors from the Wadden Islands became captains on these ships. Stones on graveyards and architectural details of their houses on the islands still bear testimony of this episode.

From the late 19th century onwards the Netherlands' landscape was thoroughly redesigned by extensive drainage systems, dikes and canals construction. Agriculture and fisheries modernized. This transformation was also felt in the Wadden Sea region when the area was redesigned to fulfill human needs. Rivers were dammed and bays embanked. A few decades later tourism slowly developed as a major industry and gradually the coastal landscape started to become a valuable asset without converting it into something else. Viewing the completely open horizon and the very extensive tidal mudflats became a unique experience highly appreciated by the urban population and it inspired artists, authors and photographers (Wijnands 2007).

Since the beginning of the 20th century small nature reserves have been established in the Wadden Sea region to protect breeding birds. Even though the importance was well known it was only after World War II that the three coun-

tries documented the significance of the Wadden Sea as one large important eco-system (Abrahamse et al. 1977).

Natural Gas and Oil

In the 1970s new deposits of exploitable oil and gas were found in the Dutch and German part of the Wadden Sea region, leading to heated debates about the potential environmental effects of their exploitation. Subsidence of the sea bottom with enormous changes in the quality of the tidal flats as a foraging habitat for the large numbers of migratory birds were predicted. In addition oil spills and other forms of pollution were feared and add to the oil spills that regularly take place adjacent to the Wadden Sea. Movement of ships and helicopters, the construction of exploitation platforms and supporting infrastructure for the mining operations would all add to the disturbance of the Wadden Sea ecosystem. Environmental organizations in all three countries started to lobby against mining operations in the area.

In the 1980s a number of exploitation sites started in the Dutch part of the Wadden Sea, near the town of Harlingen in Friesland and near the island of Ameland. Some other locations are operated from the mainland with only drilling taking place under the Wadden Sea. Strict requirements have been formulated for the exploitation, including a 'zero emission' policy. The expected reserves of natural gas of some of these fields are so large that the economic arguments were given priority over the environment. In particular the geological and ecological effects of the exploitation are of great concern. Reports by technical experts and the environmental movement are often contradicting each other and with regular changes in governments the topic of exploitation of natural gas in the Wadden Sea features again and again on the political agenda.

Germany exploits oil on its part of the Wadden Sea near the island of Trischen. Concessions were granted already in the 1950s but the actual production did not start until much later. The site was also included in the National Park Schleswig Holstein Wadden Sea established in 1985. The area has an estimated volume of over 100 million tons of crude oil in several layers of sandstone and is Germany's most important oil deposit. Pipelines have been constructed to transport the oil in order to reduce the risk of oil spills. Denmark does not exploit gas or oil in the Wadden Sea.

Fisheries

Wadden Sea fisheries mainly target shrimp and blue mussel. Shrimp fishing is mostly done by means of beam trawling. The annual amounts caught in each the Netherlands and Germany are about 10,000 tons. Some National Parks extending into the Wadden Sea have been declared as no-catch zones. The shrimps are sold in the market as Dutch and German Wadden Sea shrimps, giving the geographical origin as a kind of quality indication. Most of the mussel landings are in the Netherlands.

Blue mussel fishery is mainly carried out on seed mussels from natural mussel beds. The seed mussels are dispersed on culture lots until they have reached their marketable size. In the Netherlands commercial fishery of wild mussels for direct consumption is not allowed and major parts of the Wadden Sea are closed for blue mussel fisheries all together. This has been the result of the trilateral agreement between the three countries. During the 1991 Wadden Sea Conference in Esbjerg (Denmark), blue mussel fishery was considered to be unsustainable, and it was agreed to close substantial areas for mussel fishery and limited it to sub-tidal areas only. In addition, the area dedicated to mussel culture lots could not be increased. Cockle fishery is of little importance since Germany has completely phased out this activity since more than twenty years and the Netherlands only allows manual cockle fishery.

Extraction of Sand and Shells

Sand has been extracted from the Wadden Sea for a very long time for building dikes and roads. Today it is mainly used for coastal protection in particular after heavy storms and dwelling mound reinforcement. Deepening of main shipping lanes either for the major harbors on the mainland or for the ferry boats to the Wadden Islands is still allowed. Commercial sand extraction is not allowed anymore.

Hunting

Hunting of wild animals like seals of waterbirds (geese and ducks) used to be common practice on the Wadden Islands by local people. Seals and geese may not be hunted anymore at all. Hunting of rabbits is done to control their numbers and to avoid damage to dunes. Farmers can receive compensation for damage to their pasture areas by large flocks of

geese which might stay for extended periods.

Land Reclamation and Agriculture

Agriculture was never easy on the Wadden islands as flooding and intrusion of salt water made cultivating the land difficult. Only after dikes were constructed to keep the sea water out a combined livestock (sheep) and crop production developed. Land reclamation took place all along the coastal line of the three countries to expand agricultural land. Dikes were constructed as soon as there was enough sediment to allow the building of a new dike. The practice was stopped in the 1950s. Salt marshes have developed just outside the dikes and they have become semi-natural ecosystems. In some places in Germany and the Netherlands the process of land reclamation is being reversed and some old natural habitats are being restored again. Sometimes this meets a lot of resistance from farmers who cannot understand why the successful struggle against the sea should be undone. Many farmers could not keep up with the pace and mechanization of modern agriculture and have diversified their sources of income.

Beachcombing

Even though it can not be called a major economic activity, beachcombing is very much part of the local way of life of the islanders. In the past hundreds of ships were shipwrecked on the sand banks or the beaches of the islands. On all islands there is a long and still strong tradition of helping the victims in times of great need. At the same time there is also a strong tradition of 'harvesting' of whatever is washed ashore. Every island in the region has a special museum which exhibits the treasures of this tradition, most of which is not of great value. The right of the 'finder' is embedded in the island culture. What is found on the beach is immediately considered to be private property. And even nowadays and particularly during stormy weather islanders have the habit to drive their cars over the beach while looking for 'lost property'. Ships may have lost containers full of all kinds of merchandise, fishing equipment may have washed ashore, and wood of all types can be used on the island etc.²

Tourism

Tourism has developed in modern times as the major industry of the Wadden islands. Since World War II, and with the improvements of the infrastructure, millions of visitors want to spend some time on the island. During summer time, the tourist population of most islands outnumbers the autochthonous population at least tenfold. Most of the tourists come to get a feeling for the area in terms of the natural and cultural landscape (beaches, dunes, wild life, islands-away-from-the-mainland, traditional villages with characteristic houses, farms, and churches and folkloristic traditions). The islands are ideal for walking, hiking, horse riding, bird watching, walking across the tidal flats and other types of outdoor entertainments. In the 1950s and 60s, most farmers converted their stables into accommodations for groups of young people during the summer. Over the years higher quality accommodations, camping sites, bungalow parks, and golf courses have been constructed to attract not only young people but also a share of the wealthier part of the tourists. Some members of this group look for a second home on the island or have a desire to live there after retirement. Because of limited amount of land available for this purpose, only few can actually do so. Cultural events and art festivals have been added to the islands' entertainment agenda. It is interesting to see how these islands are also involved in a kind of competition. On the one hand they are part of one region, the Wadden Sea, while on the other hand, they need to stress their uniqueness amidst the other islands in order to attract tourists. This uniqueness is expressed in terms of island characteristics, in terms of history, or in terms of facilities offered.

2. During some recent heavy storms in 2007, tens of containers washed ashore on the islands of Ameland and Terschelling. During the first storm thousands of pairs of high quality sport shoes could be collected by the islanders. During the October 2007 storm the beaches were covered with bananas. The islanders immediately took the opportunity of making a little business out of this luck and started selling the bananas just as they had done with the sport shoes some time earlier. The bananas that were no longer suited for human consumption were donated to the zoo in the town of Emmen. The Dutch Tax office was quick to charge the zoo official import tax for the bananas until public irritation made the Tax Office refrain from putting this idea into practice.

11.4 Environmental Problems

The value of the Wadden Sea region as a conservation area of international relevance is susceptible to pressures of various kinds which may have an irreversible effect on the area. Both The Netherlands and Germany have plans to improve the infrastructure to allow larger ships to enter their harbors and increase the speed of loading and unloading. Dredging, construction of industrial facilities like energy generation and energy transportation are likely to take place in the Ems-Dollard region and the estuaries of the Elbe and Jade in improve access to the harbors of Hamburg and Wilhelmshaven. Dredging of gullies and disposal of the material is likely to have some effect even though the material itself will be deposited within the Wadden Sea region and the entire process is closely monitored.

Oil spills, disturbance and subsidence of the bottom of the tidal flats are some of the risks connection to the exploitation of natural gas and oil. Reports on these effects do not come to similar conclusions. In some it is argued that subsidence of the bottom is easily compensated by natural sedimentation, while others claim to have proof of subsidence.

Coastal flood defense and protection has been a part of history in order to protect human settlements on the islands and along the coastline. Reinforcement of the dikes and protection of the dunes by compensating for beach erosion is done by adding sand taken from the offshore area. No major changes of the landscape or some of its natural processes are foreseen. At some stages in history, civil engineers proposed to build dikes to give the islands a permanent road connection to the mainland. One such a dam was built in the last part of the 19th century to connect Ameland. Two heavy storms destroyed the dam beyond repair. Only the Danish islands of Sylt is connected to the mainland by the Hindenburg dam in 1927 and Rønø is connected by a dam built in 1947. All other islands can only be reached by ferry boat or small airplane, while some of them can be reached by foot across the tidal flats.

Since a few years the three countries discuss joint policies to harmonize the interests of nature protection and coastal defense in the context of sea level rising and changing climatic conditions (including increased impact of heavy storms). Integrated salt marsh management is one component of this approach. Invasive species continue to be an issue of great concern because of their potential impact on local species. The rapidly spreading Pacific oyster and Japanese seaweed are known to out-competed local species. New exotic species cannot be introduced into the area.

Parks of energy generating windmills have been constructed in some parts of the Wadden Sea, dividing opinions among environmentalists in favor and against. While windmills are a good and an environmentally friendly alternative for fossil fuels, they disturb the natural landscape and form dangerous obstacles for the large flocks of migratory birds.

Pollution caused by the large rivers is still a major problem in the Wadden Sea. Metals like lead and zinc are found in relatively high concentrations, in spite of substantial reductions since the 1980s. These materials tend to accumulate in the food chain until they reach dangerous levels in some animal species. High level nutrients like nitrate and phosphate have been reduced due to water purification and phosphate free detergent.

Oil pollution is still a problem too. The source of this pollution is not so much the exploitation of the oil fields in the region itself but illegal discharges of fuel oil residues in the open seas. Because of the prevailing winds these oil spills continue to form a threat to seabirds. Inspections by special airplanes and heavy penalties have reduced the number of incidents but thousands of birds still die every year because of this kind of pollution (Waddenvereniging 2003).

11.5 Management Structure

The management structure of the Wadden Sea is relatively complex as it involved both the trilateral governance structure as well as the internal modes of governance within the three countries. And these structures do not nicely overlap. In the Netherlands for instance the Wadden Islands are relatively marginal parts of three different provinces (North Holland, Friesland and Groningen). All islands constitute municipalities within the administrative structure of the country. Only the island of Rottumeroog is part of the coastal municipality of Warffum. The islands are not governed as a single geographical unit. The same complexity is observed in Germany and Denmark. There is still some unclarity between the Netherlands and Germany regarding the exact location of the border, within the Eems-Dollard river estuary. At the national level there are competing interests in the Dutch part of the Wadden Sea region between nature

protection and the exploitation of gas fields. For a long time part of the area was used for military training purposes. Some initiatives have been taken to establish coordinating bodies between various departments but until now there is still not sufficient coherence in policy.

In Germany the administration of the Wadden Sea is partly under four states: Niedersachsen, Bremen, Hamburg and Schleswig-Holstein, but also under the Federal Government. The waterways are managed by the central government while the dikes and tidal flats are tended by the states. The Federal Government regulates the shipping permits. Nature conservation considerations do not play a major role in this as that is the competence of the states.

In Denmark the Wadden Sea Region is part of the two provinces of South-Jutland and Ribbe. Both provinces have strong nature conservation authorities that have an advisory role as well as an implementing role. Various departments of the central authority however have jurisdiction over exploitation of minerals and land reclamation. The Department for the Environment is authorized to supervise projects in these fields in order to make a coherent plan for the entire Danish Wadden Sea region.

The current governance structure of the cooperation consists of the trilateral governmental conference, senior officials, a trilateral working group and a trilateral monitoring and assessment group which is the only permanent working group under the central trilateral working group. Finally there are a number of technical working groups for specific tasks such as for monitoring migratory birds, landscape and cultural heritage, sea level rise, and a seal expert group.

The most recent Tenth Trilateral Governmental Conference on the Protection of the Wadden Sea on the Dutch island of Schiermonnikoog in November 2005, adopted a new declaration. The declaration states that efforts with regard to the protection and management of the Wadden Sea would be maintained and reinforced as a coherent system in cooperation with the stakeholders, with a view to also improve the sustainable development of the region (Ministerial Declaration 10). Nine sections discuss the main fields of the cooperation in greater details:

1. The joint preparation of the Wadden Sea Plan, incorporating relevant European Directives (Habitat and Birds Directives) with a detailed insight in best practice on the management of the landscape and cultural heritage;
2. Germany and the Netherlands agreed to develop a joint proposal for the nomination of the Wadden Sea as a World Heritage Site. Denmark decided not to join this initiative at that stage;³
3. The Wadden Sea Forum (...) was accepted as a valuable partner in achieving sustainable development of the Wadden Sea Region and contributing to an integrated coastal zone management strategy;
4. A special section was devoted to shipping and its potential negative impacts in the Wadden Sea. A number of recommendations were adopted (aerial surveillance in coastal regions, spatial planning, pollution response capacities etc.);
5. Climate Change, Sea Level Rise and Coastal Protection;
6. Construction of Wind Turbines;
7. Trilateral monitoring and assessment program;
8. Cooperation with West-Africa;
9. Continuation of cooperation (Declaration of Schiermonnikoog 2005).

A recent addition to the transboundary management of the area is the Lancewad Plan aimed at the increased collaboration between the three countries to preserve, maintain and develop the cultural landscape and heritage in the Wadden Sea region. The project is funded by the European Union. The motto of the plan is to create 'a living historic landscape' that will be managed within a transboundary context. The initiative was taken on the assumption the cultural heritage is often under pressure from structural changes driven by mainly economic issues at regional, national, and European level, which lead to rapid transformation. The steering group of this Lancewad Plan works under the umbrella of the trilateral cooperation. In June 2007 an integrated strategy was presented and discussed in Wilhelms-haven during a conference highlighting the results of three years collaboration. The recommendations formulated at the end of the meetings called for intensification of the work on conservation and wise management of the landscape and cultural heritage of the Wadden Sea Region.

In the analysis a number of potentials were identified: variety and landscape values, biodiversity, awareness, accessibility and cultural tourism.

At the same time a number of vulnerabilities are clearly present in the region, most of which are caused by eco-

3. It is not clear from the documentation why Denmark decided not to join this nomination.

conomic development across relevant sectors, but also by changes in the natural environment, in particular sea-level rise and global warming. Some of these vulnerabilities are:

1. Agricultural policies. The EU common agricultural policy has had a big impact on the agricultural sector. Largely aimed at high-tech industry, producing more and more food, the policy has led to scale enlargement, thereby threatening the diversity of the cultural landscapes, including some unique heritage elements.
2. Urban development. Only careful physical planning can ensure the cultural heritage values while trying to meet some of the demands of a more viable economy on the islands such as those related to the infrastructure.
3. Demography. Many small islands face declining populations because of reduced employment in the agricultural and fishery sectors. Sometimes the composition of the population changes as newcomers and commuters take over the houses. The vitality and quality of the local cultural life might suffer as a result of a diminished sense of belonging and awareness about cultural values.
4. Energy supply. Energy generation plays an important role in the Wadden Sea Region. In the Dutch and German part it is mainly gas and oil extraction while numerous wind parks have been installed. These also tremendously affect the cultural landscape.

The Lancewad project has formulated a vision to inspire the long-term protection by development of the landscape and cultural heritage of the Wadden Sea Region. This vision reads as follows:

For more than 2000 years, the landscape and cultural heritage of the Wadden Sea Region has displayed the richness of the specific nature of the Wadden Sea and the unique interaction with man to its full extent. The overall landscape characteristics entail the wide open skies, the straight horizons, the clear transition between sea and land, the notion of being engulfed by nature on the seaside; and on the landside, the dwelling mounds, dikes and the settlements as green oases in the open fields. In the inhabited areas, the different characteristics of the landscape and cultural heritage of the several sub-regions can be clearly distinguished. The cultural; heritage is well kept and (re)used. New developments show new faces into “old portraits” enriching them and telling the continuing story of living in the Wadden Sea Region, a landscape of world-uniqueness (Lancewad Plan 2007: 12).

Based on this vision strategies and policies are formulated for various fields (agriculture, nature conservation, tourism and coastal protection and water management) in an effort to overcome all kinds of obstacles. Specific projects are formulated to turn this vision into a new reality.⁴

11.6 Discussion and Conclusions

This year it is almost 30 year ago that the Trilateral Wadden Sea Cooperation started. It was a pioneering effort in the field of transboundary environmental management of a unique natural environment which was at the same time a marginal area in terms of political attention. It was only when the conflict between nature conservation on the one hand and economic development including exploitation of mineral resources and fisheries escalated that the Wadden Sea Region was put on the national agenda of the three countries involved. There is a general feeling of positive effects of this transboundary initiative. There is political agreement on adopted targets in terms of ecological indicators, cultural status and physical and chemical quality of the area. There is a shared management plan, a shared policy assessment report and agreements have been made with respect to protection of seals. A joint secretariat is doing great work and so on.

At the same time however there are also great concerns about the effectiveness of the tripartite cooperation, due to overlapping and resource intensive structures, unclear responsibilities and accountabilities and inadequate strategic and collective leadership. The role played by sectoral stakeholders is not always clear. Reference is also made to the complexity of the administrative situation and the various levels of governance that do not always speak with one voice. Contradictory policies and changing political priorities within municipalities, provinces, states and countries cause confusion to those involved in the management of the area. A general complaint is also that the profile of the

4. In 2005 a joint cultural-historical project was published under the title of *Wadden, a narrative landscape* inspired by the LanceWad report. The publication provides a literary description of the entire area by historians, journalists, authors and photographers of all three countries. This publication provides a comprehensive image of all 17 cultural-historic districts of the Wadden region and was published simultaneously in Danish, Dutch and German (Abrahamse et al. 2005).

transboundary cooperation is in fact not reflecting the importance of the Wadden Sea. Within the three countries the profile is simply too low and a powerful communication strategy should raise its status. This would automatically lead to more commitment of the governments and move beyond good intentions. It is assumed that the area has the potential to become a European model for transboundary management based on the so-called 'ecosystem approach' as adopted by the parties to the Convention on Biological Diversity (CBD 2004). It is suggested that the three countries should actively seek more international recognition of their achievements for instance by jointly presenting the Wadden Sea Region during the forthcoming Conference of the Parties to this convention in Germany in the year to come (2008).

With respect to the form of governance it became clear that after thirty years of cooperation the prevailing structures are overlapping as well as contradictory. They are also resource intensive while they lack clear responsibilities and accountabilities. Strong leadership is missing and that is why the management of the area is not very well organized. It is suggested that the Trilateral Wadden Sea Board will not only be comprised of representatives per country but also by a number of independent members and an independent chair that will govern the secretariat.

At the end of the day it can not be denied that the present state of management of Wadden Sea is partly to be described by the conflicting views with respect to the future of the area. These differences refer to the extent to which exploitation of oil and gas can be permitted, whether or not expansion of wind mills parks can be continued, the intensity of allowable fisheries and the level of sustainable tourism within this fragile natural and cultural landscape. Even though vision statements have been made, in practice they do not provide sufficient guidance for firm action. Time and time again negotiations on a particular topic are closed, decisions are taken and before long they are reopened again as a result of new political priorities. Often the reopening is justified on the basis of new research reports (environmental impact assessments), containing 'scientific' information. As a consequence there is quite a bit of room to move without formally contradicting the vision statements (Moser and Brown 2007).

These somewhat critical views from within the various management authorities as well as from outside circles involved in the Wadden Sea Region, should not lead to a generally negative conclusion about the results achieved in three decades of the trilateral cooperation. There is reason to consider the Wadden Sea case as a relatively successful one in terms of transboundary management. The overall aim of the Wadden Sea Region as a conservation area is widely accepted and economic activities and disturbances are limited to a scale or subject to regulations so that they do not seriously jeopardize the conservation value of the area. This does not mean that there is no room for improvement.

Extensive, and critical conservation oriented research in all three countries, including the monitoring of potential risks plays a key role in this process. A strong environmental movement is keeping a watching eye on any new development. Some processes however are largely behind control of local or even national governments. Two examples are the sea level rising and the threats posed by invasive species or hazardous materials brought to the Wadden Sea by the waves of the North Sea.

Compared with other transboundary conservation efforts this relative success can be explained by a number of factors (Mittermeier et al. 2006). First of all, Denmark, Germany and the Netherlands are like-minded when it comes to environmental awareness. The Wadden Sea also holds a similar position in all three countries: a relatively marginal area in terms of economic activity with outdoor, cultural and eco-tourism as the major income generating source. The international conservation relevance of the Wadden Sea is shared by all countries and strongly supported by a large number of international conventions. This status is strongly supported by scientific evidence and public awareness that the area needs to be governed as a single ecological entity even though its territory is shared by three countries.

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Transborder Environmental Management in the East-West Economic Corridor (EWEC) Project

Thavivongse Sriburi

Abstract: The 1,450 km long East-West Economic Corridor (EWEC) passes through four countries. It starts at Myanmar's Mawlamyine seaport, passes through seven provinces of Thailand, through Laos from Savannakhet Province to the Dansavanh border gate, and through Vietnam onward to Danang City. The EWEC has a diverse topography and climate. It has coastal plains of Myanmar, low areas and mountains in Thailand, wet delta and forest in Laos, and mountainous and midland areas in central Vietnam. The objectives of the EWEC initiative are: (i) to strengthen economic cooperation and facilitate trade, investment, and development in and among four countries, (ii) to reduce transport costs in the project influence area, and make the movement of goods and passengers more efficient; and (iii) to reduce poverty, support development of rural and border areas, increase the earnings of low-income groups, provide employment opportunities for women, and promote tourism. The EWEC is also expected to provide focused support for development opportunities, including agro-industry and tourism. The projects carried out under EWEC fall under the sectors: (i) transportation; (ii) energy; (iii) telecommunications; (iv) tourism; (v) trade facilitation; (vi) agriculture; and (vii) private investment and industrial estates. The corridor will bring practical and long-term benefits to member countries. Better access to natural resources, sea products and energy will be provided for manufacturing and processing sectors. The corridor will enhance trans-border trade and investment and develop new economic activities by establishing trans-national economic areas. The direct effects of the proposed policies, programs, and institutional actions are likely to underestimate the overall economic, social and environmental impacts of EWEC activities because of their spillover effects. Integral with sustainable development and the reduction of poverty is the protection of the natural source base on which EWEC development depends. The objective of reducing poverty in the course of economic growth is consistent with the goal of addressing environmental problems in the corridor. Improved regulation of trade and institutionalizing informal trade by facilitating movements along the corridor are expected to favorably impact environmental conditions because the corridor encompasses forest-surplus and forest-deficit countries. The aim is to eliminate regulatory constraints and introduce incentives that encourage development of comparative advantages of the different areas of the corridor. The EWEC, however, will adversely affect critical ecosystems and areas valued for their high biodiversity by fragmenting habitat. Over the long-term, environmental degradation will undermine the region's environmental security and long-term socioeconomic development.

12.1 Greater Mekong Sub-region Program

As transborder environmental issues become more complex, international negotiations to address them increasingly rely on scientific and expert information to provide information to policymakers. In designing the processes by which expert advice will be taken into account in negotiations, policymakers often look to similar types of processes informing other environmental issues, in search of lessons for application to the issue at hand. Though it is generally accepted among those involved in such processes that some agreements have incorporated expert advice more effectively than others, there is little systematic evaluation by policymakers or academic analysts of the factors that lead to effectiveness across different issues. It is difficult to determine what lessons might best be drawn from the previous experiences, and there is disagreement even about what constitutes effectiveness.

The paper assesses these principles in the case of the East-West Economic Corridor (EWEC), which is now being developed in the Greater Mekong Subregion (GMS). GMS consists of Cambodia, Lao PDR, Myanmar, Thailand, Vietnam, and Yunnan Province of the People's Republic of China (PRC). With a total land area of 2.3 million square kilometers, the GMS is home to some 250 million people who share the world 12th largest river, the Mekong. It is strategically located, and has the potential to serve as an important land bridge between and among Southeast Asia, South Asia, and East Asia. The GMS comprises of an overall gross domestic product of about \$190 billion. GMS countries are home to various ethnic minority groups, many of whose territories span national boundaries. The GMS has a rich and diverse natural resource base, which has historically supported economic development and sustained rural livelihoods. In recent years, these natural resources have come under increasing stress from the combined effects

of rapid demographic and economic change, unsustainable exploitation of natural resources, the impact of development programs and projects, and the relative weakness of protective and regulatory institutions.

The GMS Program

The GMS Program was initiated in 1992 to facilitate sustainable economic growth and to improve the living standards of the people of the GMS. At the Tenth and Eleventh Ministerial Conferences on Sub-regional Economic Cooperation held in Yangon (27-29 November 2001) and Phnom Penh (23-25 September 2002), the Ministers agreed on the need for a common strategic environmental framework for protecting the environment and ensuring community interests. The GMS Program, which is being supported by the Asian Development Bank (ADB) and other donors, covers both “the hard” (infrastructure development) and “soft” (multi-country agreements and reforms) aspects of cooperation. It involves the implementation of high priority sub-regional projects in transport, energy, telecommunications, environment, human resource development, tourism, trade, investment and agriculture.

The proposed road project (Figure 12.1), linking Mawlamyine (Moulmein) in eastern Myanmar to Mae Sot in western Thailand, is part of a much larger transportation initiative headed by the ADB known as the “East-West Economic Corridor.” The section in Myanmar, if completed, will connect with other highways in Thailand, Laos, and Vietnam to create the first transportation corridor running the entire width of mainland Southeast Asia, a distance of 1,450 kilometers.

The Strategic Framework for the GMS

The First Strategic Framework for the GMS focuses on five strategic development thrusts:

1. Strengthen infrastructure linkages through a multi-sectoral approach;
2. Facilitate cross-border trade and investment;
3. Enhance private sector participation in development and improve its competitiveness;
4. Develop human resources and skill competencies;
5. Protect the environment and promote sustainable use of the sub-region’s shared natural resources.

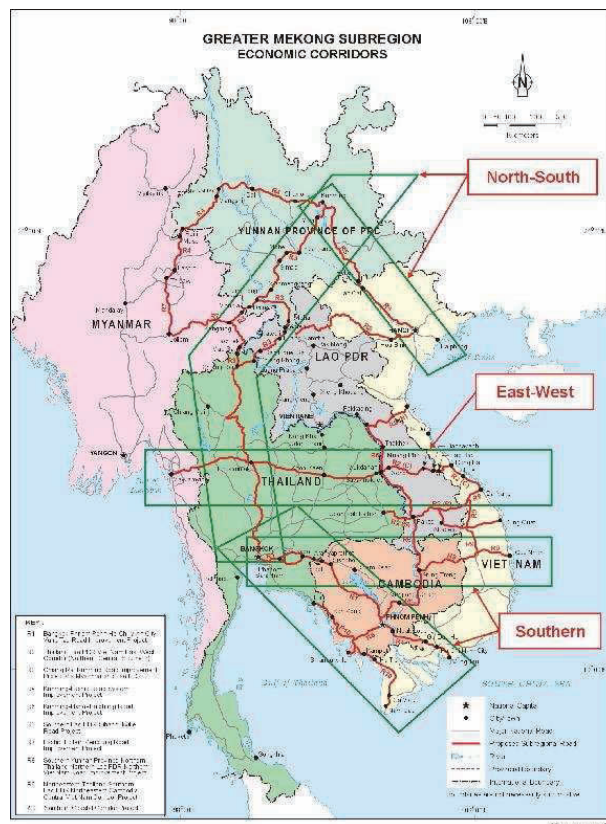


Figure 12.1 The GMS economic corridors

During the Eighth Meeting of the GMS Working Group on Environment in April 2002, the country representatives recognized the importance of developing environmental performance review systems at the national and sub-regional levels in order to incorporate environmental considerations in national development policies and economic plans and to incorporate the results of national analyses in the Strategic Environment Framework (SEF) to further strengthen its dynamic utility. Thus the representatives unanimously supported the overall concept of the proposal on “National Performance Assessment and Sub-regional Strategic Environment Framework” as the follow-on project to the ADB-financed SEF.

The GMS countries have undertaken programs intended to lessen the degradation of the environment and natural resources, in particular to counteract deforestation and urban pollution, and to support sustainable development, including efforts to promote integration of environmental concerns into economic and social decision making. Like most developing countries, the GMS countries have limited institutional capacity or information on environmental quality and trends to support such strategic planning. To enable informed development decision making, it is essential to establish an effective performance assessment system supported by timely information using reliable environmental indicators.

Facilitating Cross-Border Trade and Investment

Increased trade and investment in the GMS will be the main drivers of economic growth. Carefully supported by policy and appropriate regulatory frameworks, and infrastructure linking rural areas to national and regional markets, trade and investment will also be the main drivers for reducing poverty. These initiatives are closely interrelated with those of ASEAN and be made consistent with the WTO framework. The ASEAN Free Trade Agreement (AFTA) results in a free trade area involving five of the six GMS countries. ASEAN protocols also address harmonizing foreign investment regimes. In addition, ASEAN and PRC are working on an ASEAN-PRC free trade agreement. These developments and proposals, together with PRC’s achieved membership in the WTO, open great opportunities and challenges.

By and large, the Trade and Investment Program aim to minimize trade impediments among GMS countries and create a favorable investment climate, thereby encouraging strong participation by domestic and foreign commercial interests. The program entails important subcomponents, including improving the data system for trade and investment, establishing single-stop customs inspection stations and products and services in support of small and medium enterprises (SMEs), and reducing barriers to trade in agricultural products. The program also relates closely to the other programs, such as transportation, telecommunications and energy cooperation initiatives, and the all-important Framework Agreement for the Facilitation of the Cross-Border Movement of Goods and People.

Enhancing Private Sector Participation and Competitiveness

The private sector enterprise is acknowledged by all GMS countries to be the engine of economic growth. A unifying theme for the GMS program is creating an enabling environment for business enterprise, especially for the private sector. The GMS countries can benefit from sharing experiences in determining the proper role of government in a more market-based economy. A supportive framework for private enterprise is essential, including a strong financial sector, greater transparency and the rule of law, privatized state enterprises, investment in the education and health of the sub-region’s labor force, and an appropriate regulatory framework for protecting the environment.

The programs are collectively relevant because they are based fundamentally on providing a supportive framework for private enterprise. The Program for Enhancing Private Sector Participation and Competitiveness addresses additional, sometimes very specific factors. A particular concern is the managerial, marketing, and other skills of SMEs and accessibility of financial services. To help SMEs and other commercial interests find a “voice” for their needs and views, the GMS Business Forum is being strengthened and its activities are being expanded.

Developing Human Resources and Skills Competencies

As the private sector is an engine of growth, human resource development will be regarded as the main “building block” for the sub-region’s development. The fundamental importance of HRD and the information/ communications revolution, underscore the need for proactive regional cooperation initiatives in this field. Differences in language and culture normally favor national programs in these areas. Regional initiatives should focus on factors related to educa-

tion, training, labor markets, and health that can be addressed most effectively and efficiently through sub-regional cooperation.

The objective is to strengthen the sub-region's most valuable resource – its people – and strengthen their capacities. The Program on Developing Human Resources and Skills Competencies provides a framework for wide-ranging cooperation. Pipeline projects include support systems for harmonizing training standards and skills certification systems, a system for accrediting training institutions, and capacity building concerning vocational training institutions. Pipeline projects concerning health address cross-border migration and communicable diseases such as HIV/AIDS.

Flood Control and Water Resource Management

The goal for sub-regional cooperation in flood control and water resource management is to prevent or minimize social and economic losses due to floods through a combination of sustainable resource and floodplain management measures. This program complements the initiatives of the Mekong River Commission (MRC) and includes four major groups of floodplain management measures:

1. Land use planning, to minimize risks to people living in vulnerable floodplain areas;
2. Structural measures, such as building platforms for dwellings and making roads flood-proof to minimize hazards to people living in floodplains, and construction of flood mitigation structures such as dams and embankments to reduce flood damage to urban settlements;
3. Flood preparedness, to strengthen institutional capacities to prepare for floods;
4. Flood emergency, to build capacity for responding to flood emergencies.

GMS Tourism Development

Tourism is a major industry in the GMS countries and presents great potential for further expansion, especially for relatively undeveloped GMS countries and areas. Over the past decade, efforts to develop and promote tourism through regional cooperation have achieved significant success. The GMS Tourism Development Program builds upon this achievement. The objective is to make the sub-region an internationally recognized “single destination site,” enabling domestic and foreign tourists to take maximum advantage of the sub-region's features and attractions.

Key infrastructure critical to promoting the sub-region as a “single destination site” will be supported. “Soft infrastructure” will also be improved, including inter-country visa recognition and greater mobility for tour operators and guides. Special effort will be directed at extending tourism to poor and remote areas, including through the development of eco-tourism. The quality of tourism services will be improved through training and other measures. The private sector will be encouraged to take charge of tourism development within a well-defined social and environmental regulatory framework.

Strategic Environment Framework

The GMS is endowed with a rich natural resource base that sustains economic development and helps maintain rural livelihoods. A major challenge facing the GMS Program is to assist GMS countries maintain these and other crucial environmental resources on which depend much of the sub-region's social and economic development. The primary objective of the SEF is to help integrate environmental considerations in economic development planning. The program includes:

1. Identifying opportunities for improving environmental management in the GMS;
2. Building awareness and capacity in regional environmental assessment;
3. Enhancing public participation in GMS decision making;
4. Defining a set of environmental parameters and mechanisms to initiate an environmental monitoring program.

The SEF program combines analytical, participatory, and policy-oriented processes that together constitute a strategic platform for guiding investment decisions in the GMS. The first phase developed a strategic platform to guide infrastructure investment decisions in the GMS, consistent with the demands of environmental and social sustainability. The second phase facilitates decision making, by creating a data warehouse which will structure and organize relevant data and information at the national and sub-regional levels to make them readily accessible to the decision maker, by providing performance assessment methodologies and by establishing a framework and platform through which knowledge will constantly be added to the existing database.

Resource Mobilization for Sub-regional Economic Cooperation

Mobilizing resources for sub-regional economic cooperation among GMS countries has succeeded in supporting a wide array of initiatives. Significantly, the GMS Program has been an important catalyst in this. Investment projects in transport, energy, and tourism infrastructure development worth almost US\$ 2.2 billion have either been implemented or are being implemented. For these projects, ADB has provided US\$ 887 million in loans. About US\$ 1.3 billion has been mobilized from the GMS governments, co-financiers, and private sector investors. In addition, about US\$ 70 million in technical assistance has supported numerous initiatives for human resource development, tourism, environment protection, trade and investment, and the establishment of the GMS Business Forum.

Most prominently, the GMS Program has encouraged the six member countries to initiate on their own accord new cooperation agreements. Examples include the opening of new air routes and international airport designations in the sub-region, and energy purchase agreements between Thailand/Lao PDR, Vietnam/Lao PDR, and Thailand/Cambodia (See Lei, Chapter 2 this volume).

Linkages and Milestones

The programs constitute a demanding strategy in which all stakeholders will need to play active and committed roles. The challenges involved are all the more demanding as the various program elements are closely linked and interdependent. Logically, many of the studies and “soft” initiatives are preconditions or necessary complements to infrastructure projects. In some cases, the programs themselves are closely interlinked, as in the case of two programs concerning the environment (SEF and Flood Control and Water Resource Management). The economic corridor project is linked to the telecommunications backbone project as both are prerequisites for attracting public and private investment needed to promote economic and social development along these corridors. Also, construction of the transport components of the corridors will facilitate laying down the fiber optic cable necessary for the telecommunications backbone.

The developments for the programs provide a preliminary roadmap for future sub-regional economic cooperation. Continuing dialogue and analyses are constantly needed to ensure that sub-regional projects interlock and lead effectively to fulfilling the GMS program goals. The sub-regional programs should be complementary to the member countries national development programs. Continuing assessment, in this respect, is necessary.

To monitor progress over the next five years, GMS Ministers have identified milestone goals for the GMS Program, an initial list of which includes the following:

1. Completion of major transport corridors linking the sub-region;
2. Full implementation of GMS agreement for facilitating the cross-border transport of goods and people;
3. Single-stop customs inspection procedures and other measures to facilitate trade;
4. New air routes and visa agreement to facilitate tourism in the GMS;
5. Certification/accreditation of trade skills to enable labor mobility;
6. Sub-regional control of communicable diseases (notably, HIV/AIDS) and drug trade;
7. Implementation of power trade agreements for the sub-region;
8. Completion of telecommunications backbone and adoption of a sub-regional policy and regulatory framework for the sector;
9. Application of the Strategic Environment Framework for sustainable development;
10. Integrated expansion of the agricultural sector and agro-industry.

Thailand and the GMS

Thailand is actively determined to push for substantial progress of the GMS. Thailand has been heavily involved with several GMS infrastructure projects. On the East-West Economic Corridor, Thailand is providing financial assistance for the construction/road improvement project of the missing link in Myanmar connecting Mawalamyine-Myawaddy-Mae Sot (Thailand). While on the eastern part of the EWEC, Thailand and Lao PDR are constructing the international Mekong Bridge connecting Mukdahan and Savannakhet. On the ‘soft’ aspect of the development, Thailand has ratified the Inter Government Agreement (IGA) on Regional Power Trade in the GMS and is ratifying the GMS Cross-Border Transport Agreement.

The economic corridors are destined to be more than just transportation corridors. In the case of the East-West Corridor, the study has completed identifying potential trade and production opportunities when linked to improve-

ments in transportation and other infrastructure within the growth corridor. Policy, regulatory and financing initiatives are required to transform the transportation corridors into complex but more rewarding economic corridors. Common to the entire economic corridor is the Framework Agreement for the Facilitation of the Cross-Border Movement of Goods and People. This agreement among GMS countries will simplify customs procedures, facilitate cross-border truck travel as well as minimize the need for transshipment, among other important advantages.

12.3 East-West Economic Corridor (EWEC)

The 1,450 km long East-West Economic Corridor (EWEC) passes through four countries (Figure 12.2). It starts at Myanmar's Mawlamyine seaport of Mon State and goes to the Myawaddy border gate of Kayin State on the Myanmar-Thailand border. In Thailand, the corridor starts in Mae Sot and passes through the seven provinces of Tak, Sukhothai, Kalasin, Phitsanulok, Khon Kaen, Yasothon and Mukdahan. In Laos, it goes from Savannakhet Province to the Dansavanh border gate. In Vietnam, the route is from the Lao Bao border gate in Quang Tri Province, through Thua Thien Hue Province and to Danang City.



Figure 12.2 The East West Economic Corridor

The EWEC has a diverse topography and climate. It has coastal plains of Myanmar, low areas and mountains in southern Thailand, wet delta, forests in Savannakhet and mountainous and midland areas in central Vietnam. The corridor's commercial activities focus on six major localities, including Mawlamyine, Phitsanulok, Khon Kaen, Savannakhet, Hue, Danang and some other small-scale towns. The objectives of the EWEC initiative are:

1. To further strengthen economic cooperation and facilitate trade, investment, and development between and among Lao PDR, Myanmar, Thailand and Vietnam;
2. To reduce transport costs in the project influence area, and make the movement of goods and passengers more efficient;
3. To reduce poverty, support development of rural and border areas, increase the earnings of low-income groups, provide employment opportunities for women, and promote tourism. The EWEC is also expected to provide focused support for development opportunities, including in agro-industry and tourism.

As a result of consultations with EWEC Governments and Provincial Authorities held in 2004, a total of 77 projects/subprojects were identified to comprise the updated EWEC development. These projects fall under the following sectors:

1. Transportation;
2. Energy;
3. Telecommunications;
4. Tourism;
5. Trade Facilitation;
6. Agriculture;

7. Private Investment and Industrial Estates.

There were several studies related on the EWEC development programs which can be summarized as follows:

1. In developing the EWEC, priority should be given to the “software” aspects of cooperation, e.g., human resource development, finance, small- and medium-sized enterprise development, and cross-border agreements;
2. To address poverty reduction, it is important that EWEC development also give focus to the less-developed and remote areas which have good potential for agriculture and tourism development;
3. To study possibilities on how to connect the EWEC to the North-South corridor as well as other major sub-regional transport arteries in the GMS, including Route No. 13 that connects Lao PDR to Cambodia;
4. To clarify the relationship between existing institutional arrangements under the GMS Program and institutional arrangements proposed for EWEC development. The possibility of establishing the proposed EWEC Commission through the GMS Sub-regional Investment Working Group could also be setup.

The following priority concerns for regional collaboration have been identified:

1. Health: communicable diseases control, strengthening malaria control for ethnic minorities in the GMS, pro-poor health system development including training and technology transfer for health system development, and information exchange on health sector reform.
2. Education: expanded capacity building under the Phnom Penh Plan, continuing HIV/AIDS preventive education, improved access to quality basic education and vocational training, quality assurance, expanded networking arrangements in higher education and capacity building among existing academic and research institutions in the GMS.
3. Labor: human trafficking, labor migration, protection for migrant workers, access of mobile population to health services, skills training and standardization, training on social security systems, work environment assessment, labor standards, and community development.

The vision for the development of the EWEC is to stimulate the growth of participating areas and raise their incomes. This will be achieved through a dynamic process that facilitates the efficient exploitation of underlying complementarities and developing a range of competitive advantages that will enhance overall competitiveness. EWEC development will be facilitated once transport infrastructure improvements are put in place. Developments will occur across the entire Corridor, but need to concentrate on the borders and enclaves, while benefits differ from one EWEC country to another.

In the area of physical infrastructure, there is need to expand and further improve existing facilities, many times through an expanded role of the private sector. More importantly, physical infrastructure should be seen as a total package that also considers the new economy and the impact on the final user, rather than focus on factor costs. This will also lead to the empowerment of small- and medium-sized enterprises. In trade and investment, the emphasis is on improving information systems and improving cooperation in customs in the border areas. In tourism, there is recognition of the tremendous potential of the EWEC. Marketing and packaging of the EWEC’s tourism resources provide an opportunity for cooperative action. In the area of industrial estates development, there is a need for careful planning that takes into consideration the impact on the environment and agriculture, as well as rational use of scarce resources. Agriculture is recognized as a key to reducing poverty in the EWEC. The extensive linkages of agro-industry, in terms of geography and with other sectors, need to be highlighted.

The GMS partners recognized at the outset the potential of development projects for adverse social and environmental effects. Many of the adverse impacts are avoidable through proper planning, suitable mitigation actions, and ancillary policies. A number of mechanisms are in place within the countries to integrate environmental and social concerns into the development process, and thus provide guidance towards project selection and modification as well as the needed ancillary policies. However, experience at the level of projects as well as ecosystems and communities indicate that these safeguards are far from effective and that the difficult environmental problems and their solutions cross national boundaries. Some of these deviations are the result of persistent gaps in knowledge, capacities, and institutions, which lead to inadequate decisions and implementation arrangements. There is a need for a dynamic regional strategic environmental framework, built on assessments of national environmental performance in meeting environmental objectives.

The SEF project is a combination of analytical, participatory, and policy-oriented processes that together constitute a strategic platform for guiding investment decisions in the GMS. The first phase of the SEF was to propose a

strategic platform to guide investment decisions in the infrastructure sectors in the GMS with the aim of making such investments compatible with the demands of environmental and social sustainability. The outputs of the first phase have included:

1. A set of databases, general purpose software, and methodologies designed to support decision making on infrastructure investments in the GMS;
2. A number of analytical methodologies, including the identification and analysis of hotspots, review of case study projects at various stages of implementation, and framing of different scenarios for the development of the sub-region;
3. A set of goals for sustainable human development in the region. The SEF software and databases are available and relevant for decision making by ADB and the GMS countries.

In particular, SEF can assist national level policy makers in formulating better development plans and analyzing and assessing their potential impacts; private sector entities in designing more sustainable infrastructure projects; non-government organizations and local communities in accessing information needed for more effective participation in national and regional decision making; and regional associations and intergovernmental organizations (e.g., ADB, the Mekong River Commission, and the Association of Southeast Asian Nations) in developing better integrated regional plans, providing more effective oversight and assessment, and supporting more informed regional agreements. The main recommendation of the first phase of the SEF is to maintain and refine the SEF system, which includes further data collection, the refinement of guidance on procedures and methodologies, and training in and dissemination of the developed methodologies.

Studies of environmental disasters and long-term regional environmental changes have consistently found that the overwhelming proportion of ecological damage and human loss is highly concentrated in vulnerable ecosystems and communities, especially ethnic minority communities. Therefore, identifying the regions and peoples at greatest risk from human induced changes and natural variation, and assessing the sources and causes of their vulnerability, will help promote more sustainable development. Accordingly, the hotspot approach was carried out by the first phase of the SEF through five identified priority hotspots in the GMS. However, as one of the rich and diverse natural resource bases in the world, the growth of trade and investment flows and the accelerating development of energy and transportation resources in the GMS have led to the characterization of the entire sub-region as the new frontier of Asian economic growth. Thus, it is obvious that the development of the SEF needs to be expanded beyond hotspots to the entire sub-region. Based on the recommendations and lessons learned from the first phase of the SEF, the second phase will be aimed at facilitating decision making, first, by creating a data warehouse, which will structure and organize the relevant data and information in the national and sub-regional levels in order to make it readily accessible to decision makers; second, by providing performance assessment methodologies; and third, by establishing a framework and platform through which new knowledge will constantly be added to the existing databases.

12.4 Discussion

Asian countries dream of roads and railways that could span the region, efficiently moving people and goods, as they build a free-trade area that could encompass China within the next five years, and perhaps even India as well. The most concrete planned infrastructure project to date is the East West Economic Corridor (EWEC), which would link the vast area between the Indian and Pacific oceans. The EWEC would form part of a huge network, the so-called Asian highway, between central Asia and the Far East. It would run from the Indian state of Manipur through Myanmar, Thailand and Laos to the Vietnamese deep-sea port of Da Nang on the South China Sea. The Asian highway project was initiated in 1959 by the UN Economic and Social Commission for Asia Pacific (ESCAP), but due to a lack of political will from the governments involved, the project has remained deadlocked over the decades. But the long-awaited highway has now come one step closer to reality, with an agreement signed in Yangon by India, Thailand and Myanmar. The governments of the three countries have decided to complete the missing links of the road from Mae Sot in Thailand through to Pa-an in Myanmar and Moreh in India. No indication has been given on how the three countries will fund the project.

The EWEC presently stretches eastward from Thailand through Laos to Vietnam. The Vietnamese section from Da Nang to the Laotian border is constructed, with funding provided by the Asian Development Bank. A 200-kilometre

(124-mile) highway is under construction in Laos as well as a Thai-Lao bridge across the Mekong River that would form part of the network, linking Savannakhet in Laos and Mukhdahan in Thailand, funded by the Japanese government. Thailand's existing road network is already in good shape. The Corridor, which when complete would in theory allow travelers to drive from India to Vietnam.

The ten ASEAN countries — Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam — gave the green light to the project. But the project has yet to attract any public or private investors, and a series of obstacles remains to be overcome. On January 1, 2002, six ASEAN countries launched the ASEAN Free Trade Area (AFTA) after the regional forum decided in November 2001 to develop a free trade agreement with China over the next ten years — a move that could result in an integrated market of nearly two billion people.

The proposed projects attempt to redress the combined trade imbalance of Lao PDR, Myanmar and Vietnam with Thailand. Eight of the ten projects are expected to have a direct impact on redressing that balance. The mechanisms include improved information systems and regulatory procedures, an institutional framework to support private sector development, improved financing for SMEs, and incentives through the application of existing framework agreements. The resulting opportunity to regionalize production processes in the Corridor will offer potentially large rewards for the growth and development of the sub-region, and for the trade-deficit countries in particular. Differences in skilled and unskilled labor endowments will offer businesses the opportunity to access needed labor and thereby to lower their production costs through joint venture in neighboring countries. Where companies use those resources to expand their operations vertically to other stages of production through joint ventures, either production or transaction cost savings offer potential benefits. Integration of production processes at the sub-regional level will therefore offer EWEC businesses the opportunity to reduce production costs in technologically interdependent stages of production.

Major infrastructure components of EWEC have been completed, or are nearing completion. Adequate provisions for power along the EWEC have been made in Thailand and Vietnam, and new rural electrification initiatives are required for Lao PDR and possibly Myanmar. The proposed Nam Theun 2 Hydropower Project and associated transmission lines to Thailand will also provide needed power for Lao PDR, along the EWEC, which is currently being imported from Vietnam and Thailand.

The GMS Cross-Border Transport Agreement as well as bilateral land transport agreements between Lao PDR and Thailand, and between Lao PDR and Vietnam are now in force, but have yet to be fully implemented. Preparations are being made for the implementation of single-stop customs inspection (SSCI), initially at the Dansavanh (Lao PDR) – Lao Bao (Vietnam) border, and then at Savannakhet (Lao PDR) – Mukhdahan (Thailand) border. Plans are being formulated to establish selected industrial estates and special economic zones at border and gateway locations, which would promote private sector investment in the EWEC in manufacturing, trade and agriculture. The sustained competitiveness and efficiency of the GMS countries would depend on the development of the corridor's human resources and skills competencies, which is being addressed on a GMS-wide basis under a separate program.

In transportation, financing has been secured for the entire road corridor. A 140-km expressway from the new Hai Van Tunnel in Da Nang City to Cam Lo in Quang Tri Province, which would run in parallel with the existing Highway 1, has been proposed to accommodate the expected increase in traffic to the Vietnam ports. Projects that would rehabilitate Route 9 from Savannakhet to Seno, and construct feeder roads, which would ensure improved access to markets and social services for affected rural communities, have also been included in the Plan. The development of the Savannakhet airport for joint use with Thailand, and upgrading of Phu Bai airport in Hue, Vietnam have been proposed by the respective Governments. In addition to the Da Nang and Mawlamyine ports, two additional sea ports in Vietnam are being considered to accommodate national and sub-regional demand.

In energy, Phase I of the GMS Regional Power Interconnection Project (Nam Theun 2-Savannakhet-Roi Et) is expected to provide electricity to the EWEC areas. The extension of rural electrification along Route 9 and distribution to 71 villages in six districts has been recommended. Vietnam recommended the inclusion in the EWEC Plan of oil and gas pipeline projects from the Chan May Port-Highway 1-Route 9 to Lao PDR and Thailand for possible public-private sector financing, which needed the study to determine their viability. While the status of provision of reliable energy supply in the Myanmar section of the EWEC needs to be determined, a study for a transmission line linking the Thai border town of Mae Sot to Thaton in Myanmar has been included in the Plan.

In telecommunications, a project to improve telecommunications services in the Myanmar section of the EWEC

has been included in the Plan.

In tourism, a comprehensive tourism study has been recommended for the EWEC that will cover areas to promote tourism in the EWEC as a single tourist destination. The study has to look into potential tourism infrastructure projects in the Lao and Vietnamese sections of the EWEC, which have been identified by the respective Governments and provisionally included in the Plan.

In trade facilitation, seven projects have been included in the Plan to support the planned implementation of single-stop customs inspection at the EWEC border crossings, which include electronic data interchange and standardization of trade documents. The implementation of SSCI remains as a high priority initiative for the EWEC.

In agriculture, projects on regularizing raw material supplies in from Lao PDR and Myanmar for processing in Thailand have been recommended for inclusion in the EWEC Plan. A project on fish processing in Mawlamyine, Myanmar has been included.

The establishment of the corridor will bring practical and long-term benefits to member countries. Better access to natural resources, sea products and energy will be provided for manufacturing and processing sectors. The corridor will also facilitate cities and small towns along it to strengthen trans-border trade and investment attraction, and develop new economic activities by effectively using economic space and establishing trans-national economic areas. Goods from Laos, Thailand and China will be able to enter potential markets in Southern and Eastern Asia, Europe and America.

Corridor localities have agricultural sectors accounting for 20% to 50% of the economic growth rate. Industrial outputs are mainly from farming-based manufacture including food processing, beverages, and sea and forestry products, depending on the specific characteristics of each locality.

Industrial production is not the main economic activity of the corridor. Most of it is farming-related or light industry based on natural resources. Industrial zones are located near residential areas. Thailand has the most developed industry with strengths in timber processing, garments and metallurgy. The country also has the most abundant natural resources. Some localities in Vietnam are much undeveloped compared with others in the country. Main sectors are garments, sea products processing and cement, in which Da Nang has a well-developed industry, making up 5% GDP of national industry.

Trade exchange among nations in the Southeast Asia over the past years has increased steadily. Total export turnover between Laos, Thailand and Myanmar has experienced an annual average increase of 33%. Commercial activities at border gates mainly reflect the comparative advantages of each country. Goods are also transited to other markets. Main items are vegetables, fruit, timber, cattle and garments. Foreign investment attraction is not as remarkable as other localities in the countries.

The localities along the corridor, except for main cities and towns, are sparsely populated. Their human resources mostly lack professional skills, science-technology and labor discipline. The rates of poor households are rather high. There are some ethnic minorities, especially on the Thailand - Myanmar border. All localities have industrial establishments and free commercial areas. But they have operated ineffectively due to unfavorable positions and insufficient planning.

The East-West Economic Corridor will be an impetus for boosting economic development and cultural and social exchange between Southeast Asian countries in general and member localities in particular. The direct effects of the proposed policies, programs, and institutional actions are likely to underestimate the overall economic and social impacts of these initiatives because of their spillover effects. Integral to sustainable development and the reduction of poverty is the protection of the natural source base on which EWEC development depends. The objective of reducing poverty in the source of economic growth is consistent with the goal of addressing environmental problems in the corridor. Improved regulation of trade and institutionalizing informal trade by facilitating movements along the corridor are expected to favorably impact on environmental conditions. Because of the corridor encompasses forest-surplus and forest-deficit countries.

Trade in logs and timber, and the associated depletion of forests in the Lao PDR and Myanmar, have had severe environmental consequences. Although deforestation is associated with commercial logging, small-scale agriculture and cattle rising, the underlying causes include poverty, low agricultural productivity, and public policies. While deforestation has yielded considerable short-term benefits through timber exports and agricultural production on previously forested lands, it has large long-term costs from the loss of forest products such as timber, fibers, canes, resins,

oil, pharmaceuticals, fruits and spices. By emphasizing policies that encourage environmentally damaging activities, the proposed projects aim to shift from development that is not sustainable because of environmental degradation and depletion of resources development that is environmentally sustainable in the long run. The aim is to eliminate regulatory constraints and introduce incentives that encourage development of comparative advantages of the different areas of the Corridor in sustainable resource-based economic activities.

To address these problems, the ADB is promoting the creation of "Biodiversity Conservation Corridors." According to the ADB, these corridors will connect valuable habitat and permit species to naturally migrate between areas currently threatened with fragmentation. Major causes of fragmentation include habitat loss due to unsustainable forms of resource exploitation: intensive agriculture, logging, and gold mining activities carried out in close collaboration with state-owned enterprises. Some areas, especially along the Salween River and its tributaries inside Myanmar, are also threatened with inundation from hydropower development. The construction of roads into these remote regions has also caused severe damage; roads lead to increased rates of soil erosion and facilitate hunting and wildlife trafficking.

A series of high-level meetings involving the ADB and its partners were held in 2005, with the Action Plan for the creation of these corridors to begin implementation in January 2006. The "Western Forest Complex," which straddles the Thai-Burma Border, is of particular concern. The Western Forest Complex includes the Kayah-Karen Montane Rain Forests, which extend south into the Tenasserim (Tanintharyi) Division. The region contains mainland Southeast Asia's largest remaining tropical and sub-tropical moist broadleaf forests, including remaining stands of teak, ironwood, and other valuable hardwoods. Numerous threatened and endangered species depend upon these forests for their continued survival, e.g. Asian elephants, tigers, gaur, bateng, gibbons, Malayan tapir, Asiatic black bear, southern sereow, Plain-pouched hornbill, Gurney's Pitta, and Kitti's hog-nosed bat, to name only a few. To help protect these species, the World Wildlife Fund has added the Kayah-Karen Forests to its list of the planet's 200 most important eco-regions.

12.5 Conclusion

The EWEC, while it promises to promote economic development along the route, will also adversely affect critical ecosystems and areas valued for their high biodiversity by fragmenting habitat. Over the long-term, environmental degradation will undermine the region's environmental security and long-term socioeconomic development. The goal for environmental protection policy is to promote sustainable development in the EWEC through the creation of national environmental performance assessment systems and development of national capacities for implementing this assessment. The purposes are to facilitate at the national levels to have the effective and efficient national environmental management program and improved public accountability for the best results. And also facilitate analysis of the development effectiveness and performance-based lending criteria of aid organizations through the creation of systems on environmental indicators and performance assessments and the development of local capacity for carrying out the performance assessments.

A generic set of core indicators and prototype environmental database for the EWEC countries must be prepared to support the performance assessments for sustainable development and regional environmental protection. Technical guidelines, supported as appropriate by a set of models, must be prepared for performance assessments and integration of environmental concerns into economic and social policies. These will be used as baselines to be refined for specific purposes during implementation of the individual country-specific activities. In parallel with the preparation of these tools, technical training in the use of the guidelines will be conducted for local staff ultimately responsible for the information collection and analysis.

Country-specific needs assessment will be conducted in each participating country to identify essential institutional, technical, and human development needs, taking into account the technical guidelines. Country-specific indicators, computer models, and databases must be prepared in consideration of country-specific priorities. Based on these, country-specific performance assessment systems will be developed, and national performance assessments will be implemented in each participating country. The activities will constitute the environmental protection program, for enabling and guiding the harmonization of policy, legal, and administrative frameworks; and coordination of investment programs and development plans. Given that the purview of this program is sub-regional or national; its focus

is on the range of investments and decisions that will have a cross-boundary impact, either because they are located in more than one country or because their social, environmental, demographic, or economic impacts extend beyond national boundaries. Many adverse impacts of development projects could be avoided by using better and more informed project preparation and selection methods. Based on these, a national performance assessment system will be developed, and sub-regional performance assessment will be implemented.

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Transborder Environmental and Natural Resource Management: Case Studies of Transfrontier Protected Areas in Indonesia and Malaysia

Johan Iskandar

Abstract: The transborder tropical forest of Borneo, stretching between Indonesia (Kalimantan) and Malaysia (Sabah and Sarawak) still has high diversity of flora and fauna, and diversity of local cultures. To preserve the genetic, species, and ecosystems diversity a Trans-boundary Biodiversity Conservation Area (TBCA) was established in 1994. It comprises of the Betung Karihun National Park-BKNP (800,000 ha) of West Kalimantan and Lanjak Entimau Wild Sanctuary-LEWS (168,758 ha) of Sarawak Malaysia. The Danau Sentarum National Park-DSNP (132,000 ha) of West Kalimantan, Kayan Mentarang National Park-KMNP (1,360,500 ha) of East Kalimantan, and Batang Ai National Park-BANP (168,758 ha) of Sarawak should be integrated into the TBCA. With the TBCA some million hectares of the humid tropical forest of the transborder of Indonesia and Malaysia have been conserved to provide various ecological and socio-economic functions. Nowadays, some serious destruction of these transborder conservation areas has occurred because of poor Government policies, economic interests, sector egocentrism of development programmes and knowledge gaps between the government policy makers and scientists. Illegal logging and the exploitation of flora and fauna could not be avoided. This paper describes some problems with the transfrontier protected areas on Borneo.

13.1 Introduction

Indonesia shares a common border with Malaysia in Borneo. In general, the transborder area of Indonesia in West Kalimantan and East Kalimantan, and of Malaysia in Sarawak and Sabah has tropical forest that is in good condition. The area represents a unique biological region with a rich flora and fauna. Floristically it is dominated by dipterocarp trees, which are known for their commercially valuable woods for national and international trading.

Like the flora, various distinctive fauna have been recorded in the transborder forests of Borneo including primates like orang utan and gibbon, various endemic birds, herpetofauna, and fish (Soedjito 1999; Rahajaningtrah and Prayogo 1999; Anshari et al. 2005; Topp and Eghenter 2005). Culturally, the transborder area of Borneo is also a very rich and more than a dozen different ethno-linguistic *Dayak* and *Punan* groups live there. The *Dayak* groups practice upland rice farming, while the *Punan* characteristically collect forest products and hunt wild animals. Large rivers, which are the main transportation routes, stretch from Borneo's coast in all directions. For example, on the western side lies the Kapuas River, the longest river of the island, while on the eastern side the Kayan, Mentarang and Mahakam rivers connect the mountainous interior with the coast.

To conserve the unique genetic, species and ecosystems diversity of the transborder regions between Indonesia and Malaysia on Borneo, a Transborder Biodiversity Conservation Area (TBCA) has been established, comprising the Betung Karihun National Park (BKNP) in West Kalimantan, and the Lanjak Entimau Wildlife Sanctuary (LEWS) in neighboring Sarawak. This Transborder Conservation Area of nearly one million hectares was established in October 1994 and is the largest of its kind in the humid tropics. In addition, adjacent to BTNK are the Danau Sentarum National Park (DSNP) in West Kalimantan, and the Kayan Mentarang National Park (KMNP) in East Kalimantan. Both parks stretch along the borders of Sabah. Batang Ai National Park (BANP), which is located adjacently to LEWS, can be integrated with KMNP as a single transborder conservation area.

Adding together, the Borneo TBCA consisting of the BKNP (800,000 ha), the DSNP (132,000 ha) and KMNP (1,360,500 ha) on the Indonesia side, and the LEWS (168,758 ha) and the BANP in Malaysia figures among the largest of such areas in Indonesia and South East Asia. Because of its size, the TBCA is important not only for Indonesia and Malaysia but also in a global perspective. Borneo's tropical rain forest plays an important role in maintaining a healthy global environment as an absorber of carbon dioxide. Its preservation will reduce global warming and related dramatic climatic changes.

Although the importance of the TBCA is without doubt, the area experiences serious threats, caused by various both internal and external factors that can be categorized as market failures, inadequate sectoral government policies, and knowledge gaps between government policy makers and scientists.

This paper discusses problems with the management of the TCAB, using the case study of the Betung Karihun National Park (BKNP) and the Danau Sentarum National Park (DNSP) of West Kalimantan, and the Kayan Mentarang National Park (KMNP) of East Kalimantan.

13.2 The Transborder Conservation Areas of Borneo Indonesia and Malaysia

Of the national parks of Kalimantan that are located near the border with Malaysia, the Betung Karihun National Park (BKNP) is located in Kabupaten of Kapuas Hulu, West Kalimantan. The park was established by Forestry Minister's decree, No. 467/KPTS-II/95, dated 5 September 1995. The BKNP is directly connected with the Lanjak Entimau Wildlife Sanctuary (LEWS) of Sarawak of 168,758 ha that was established in 1983. To enhance international cooperation in managing the two contiguous protected areas, in 1994 the Sarawak Chief Minister and Indonesia's Minister for Forestry launched the Trans-boundary Biodiversity Conservation Area, to cover the two parks (Chai 2000: 2). Second, the Danau Sentarum National Park of 132,000 ha, also located in Kapuas Hulu and neighbouring the BKNP was established as a national park by Forestry Minister Decree No. 34/KPTS-II/1999. The DNSP is also recognized as an internationally important Ramsar wetland site. The Indonesian Government has signed the Ramsar Convention on wet lands, which obliges it to protect water birds, as well as other wetlands services like water storage, food control, and fisheries. Third, the Kayan Mentarang National Park (KMNP), of 1,360,500 ha located in the District of Malinau and Nunukan in East Kalimantan (Figure 13.1) was established as a national park by Forestry Minister Decree No. 631/KPTS-II/1996 dated 7 October 1996.

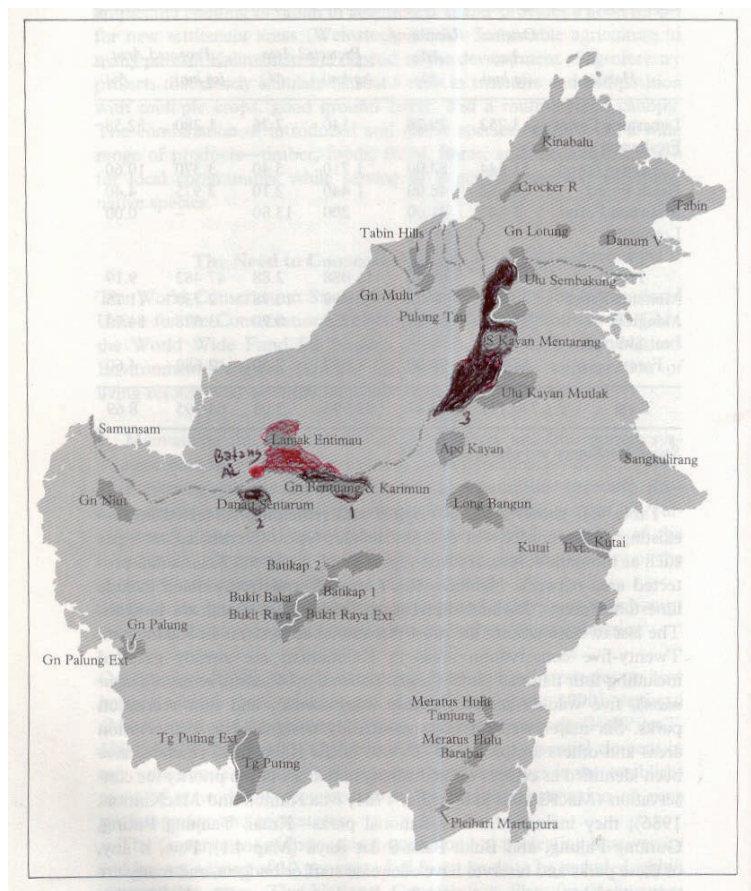


Figure 13.1 Map of Borneo with national parks (1) Betung Karihun N.P., (2) Danau Sentarum N.P. (3) Kayan Mentarang N.P. (1,360,500 ha). Source MacKinnon and Sumardja (1996: 66).

The dominant dipterocarp species are from the genus *Dipterocarpus*, *Dryobalanops*, *Hopea*, *Parashorea*, and *Vatica*. The species that yield commercial valuable wood are *Shorea* spp (meranti merah, meranti kuning, meranti putih, and bengkirai), *Dipterocarpus* spp (keruwing) and *Dryobalanops aromatica* (kapur). Other commercial trees from the parks are *Eusideroxylon zwageri* (kayu ulin or ironwood) and *Gonystilus banacanus* (kayu ramin).

Distinctive fauna in the parks are *Pongo pygmaeus*, *Macaca nemestica* (beruk), *Macaca fascicularis* (kera), *Neofelis nebulosa* (harimau dahan), *Helarcopus malayanus* (beruang madu), *Argusianus argus* (burung kauau raja), *Aceros undulatus* (julang emas), *Anorrhinus galeritus* (enggang klihingan), *Anthracoceros malayanus* (kangkareng hitam), *Buceros vigil* (rangkong gading), *Buceros rhinoceros* (rangkong badak), *Accipiter nisus* (elang alap erasia), *Tringa hypoleucos* (trinil pantai), *Phalaropus lobatus* (kaki rumbai kecil), *Scleropages formosus* (ikan arwana), *Tomistoma schlegelii* (buaya sinyulong), and *Corocodylus porosus* (buaya mauara), (Soedjito 1999; Rahajaningtrah and Prayogo 1999; Anshari et al. 2005; Top and Eghenter 2005). IUCN-WWF-UNEP (1980, cited by MacKinnon and Sumardja 1996: 64) list the importance of these three parks as follows:

1. Maintaining the essential ecological processes and life-support system on which human survival and development depend;
2. Preserving genetic diversity on which depend the breeding programmes necessary for protection and improvement of cultivated plants and domesticated animal, as well as much of the scientific advancement, technical innovation, and security of the many industries that use living resources;
3. Ensuring the sustainable use of species and ecosystems which support millions of human communities as well as major industries.

13.3 Indigenous Forest Management

The local *Dayak* and *Punan* who reside near or inside BKNP, DSNP, and KMNP have for a long time been coadapting with their local environment to the forest ecosystem of the parks. As a result, important ecological wisdom has been used by the *Dayak* and *Punan* to manage their local ecosystem, the national park's forests.

Some hundred thousand Dayak People from more than a dozen different ethno-linguistic groups, including Orang Punan, Hovongan, Hovorit, Hovo'ung, Kareho, Orang Bukat, Orang Kantu, Orang Iban, Tamambaloh, Orang Kayan, Orang Taman, Aoheng, Semukung, Kenyah, Kayan, Lun Dayeh, and Sa'ban have long been residing inside or near the BKNP, DSNP, and KMNP (Ngo 1999; Topp and Eghenter 1999; Anshari et al. 2005). The main traditional livelihood of Dayak is upland rice farming in forest clearings or *lading*. The Punan hunt wild animals and gather fruits, sago, and wild tubers (Ngo 1999; Puri 2005). In practising *lading* agriculture, normally a plot of mature forest is cleared, the felled and slashed timber is then allowed to dry and is subsequently burned. This process provides ash as organic fertilizer, while inorganic fertilizer and chemical pesticides are rarely used. After cultivation of rice and other annual crops, such as cucumber, beans, corns, cassava, sweet potatoes, hot chilies, and so on for one or two years, the plot of land is left fallow so that vegetation can re-establish itself through natural forest succession, and farmers moves on to clear and cultivate another plot. Eventually, the old plot which has grown back to mature secondary forest can be re-cultivated. The fallow period can vary in length depending on soil fertility, size of forest area, and population density, and ranges between five to 20 years.

Some mature primary forests have been traditionally protected. These forests are locally named *tana' ulen* (Lamis et al. 1999; Lahan and Njau 1999) or as *kampung galao* (Iban) or *toan palao* (Tamambaloh) (Bennet and Stuebing 1999: 189).

Tana' ulen is predominantly used for harvesting various forest products, such as rattan, woods, animal, and fish. The utilization of *tana' ulen* has been regulated by an informal leader or a former noble family (*paren*). Thus, the main purpose of this traditional forest protection is to maintain a stock of wildlife, fish and various forest products.

13.4 Socio-Economic-Cultural and Ecosystem Changes

Some of the forest ecosystems of the BKNP, the DSNP, and the KMNP have been seriously damaged. This destruction has been caused by ill conceived government policies, development programmes and knowledge gaps between government policy makers and scientists.

Government Policies

(a) According to decree, UU No.5/1975 concerning village administration (*tentang pemerintahan desa*) a village administration must be homogeneously organized. As a result, since the 1980's, all remote villages of Kalimantan with populations less than 250 people, including those located inside or surrounding the BKNP, DSNP, and KMNP, must be united with other villages. Many remote villages that had the status *desa* changed their status to *dusun* or hamlet. This regulation, however, did not consider ethnic affiliation as the main principle for organizing villages. This has led to situations like Beringin village, adjacent to BKNP where the village leader is of the Bukat group, but most of the people in the village are Punan. Consequently, the village leader has not been respected by most community members, resulting in problems with managing the village administration. The village leader is related to the sub-district leader (*camat*) (Ngo 1999; Kartawinata 2007). This has caused illegal logging, and illegal exploitation of other flora and fauna by local people, which was not adequately addressed by the village leader. This situation was different during the reign of previous village leaders.

Some villages that were scattered in remote areas bordering BKNP, DSNP, and KMNP have been relocated closer to sub-district offices in the 1980s, while, informal authorities were abolished. Non-written regulations related to environmental and natural resources management were violated since then. Nowadays many local people cooperate with outside people who extract forest products from *tana'ulen* without getting permission from the local indigenous leader. Local people also became involved in illegal logging activities. Some *tana'ulen* of bordering the KMNP even have been sold to forest concessions.

The socio-economic conditions of villages near or in BKNP, West Kalimantan, and the villages of neighbouring LEW, Sarawak are very different and the West Kalimantan villages are generally much poorer. This explains in part the harvesting of valuable products, like *Aquilaria beccariana* (gaharu) and *Suleropages formatus* (arwana merah/red arwana) from BKNP and DSNP, to be traded to merchants in Sarawak. The red arwana is protected by Indonesian law and listed in the CITES appendix 1, while *gaharu* is listed in Appendix II of CITES. Red arwana, is therefore prohibited from being traded and gaharu only with special permission from government authorities. The flourishing illegal trade of flora and fauna from Kalimantan to Malaysia is certainly linked to the extreme socio-economic differences between villagers across the border. I, therefore, agree with Margalef (1968, cited by Soemarwoto 2006: 31): if two different ecosystems are connected the poor ecosystem will be exploited by the strong ecosystem. Developing a new road and more intensive economic exchange in the transborder area will increase the exploitation of natural resources of BKNP.

(b) The introduction of decree No. 22 concerning local autonomy and No 25 concerning budget balance between national government and local districts (*Undang-Undang No.22 Tahun 1999 Tentang Pemerintahan Daerah and Undang-Undang No. 25 Perimbangan Keuangan Antara Pemerintah Pusat dan Daerah*) (Anonymous 1979) have encouraged district governments to generate their own local income (*pendapatan daerah=PAD*). One key strategy common among Kalimantan district governments is exploiting forests and other natural resources.

(c) Through the introduction of decree No 5/1967 concerning forestry (*Undang-Undang Pokok Kehutanan No. 5/1967*) the national government has given special rights to forest concessions to harvest forest in areas more than 100 ha. Through government regulation No. 6/1999 concerning the rights over forest products (*dan PP No.6/1999 tentang HPHH-Hak Pengusahaan Hasil Hutan*), the district government (*bupati*) has been given the mandate to grant cooperative groups permits to harvest timber in forests areas of 100 ha, while neglecting traditional people's rights. During 2001 2002, and 2003, 167, 227 and 148 of these permits were issued in the Kapuas Hulu district. In many instances, local people passed on the permits to timber entrepreneurs for a fee which is called as *premi kayu*. The logging undertaken under these permits was often financed by *cukong kayu (tauke)* or middlemen from Malaysia. In 2000, for instance, 12 of these Sarawak middlemen bought timber. Some forest concession (HPH) harvest timber in DSNP. The road between Putussibu and Lanjak-Nanga Badau has been very busy with timber trucks, and saw mills have been constructed along the road to Nanga Badau. Four of these were built by the same middlemen who bought timber across the border. Consequently, some local people have exploited timber from DSNP.

Kayan Mentarang National Park (MNP) also recently has experienced illegal logging, probably from intrusion from logging concessions across the border in Malaysia that are now moving closer to the KMNP border.

The local government has very limited budget to construct new roads in the remote areas and as a result the role of timber companies to construct new roads has increased. It has been rumoured a long time that the local government

plans to construct a new road across the border from Kayan to Ulu Padas in Sabah (Topp and Eghenter 2005: 31). This already has increased illegal logging and is likely to continue to do so in the future.

13.5 Market Economy

Characteristically the main traditional livelihood of the local people who reside near BKNP, including Dayak Iban and Tamambaloh of Kecamatan Embaloh Hulu, Batang Lupar and Badau is upland rice farming and collecting forest products, such as rattan, gaharu, tengkawang fruit, and edible swallows nest (Karim 1999). These forest products were normally sold to Pontianak and Sarawak. Since transportation infrastructure access has developed rapidly, the market economy has penetrated into remote villages and an increase in demand for forest products has driven up prices for rare species. Until the early 1980's, red arwana was caught for home consumption only from sub-watersheds of the Kapuas rivers. However, as the demand for red arwana in Malaysia and Singapore has increased, its price has dramatically increased too. For example, in the 1990's one red arwana fish was normally sold to middlemen for about 2-3 million rupiahs. This fish has been intensively caught for export to countries like Japan, Taiwan and Singapore.

Like the red arwana, prices for gaharu wood have increased due to its increased demand in Malaysia and Singapore. Consequently, the species has intensively been harvested by both local people and outsiders and, gaharu wood has nearly disappeared in the BKNP, DSNP, and KMNP.

13.6 Sector Egocentrism and Knowledge Gap

Based on the Indonesian development programmes, various developments have been undertaken by some sectors or departments which have a partial sector egocentric view. For example, forest land use may compete for various purposes, such as the timber industry, oil palm plantations, mining and national parks. Development programmes have aimed to obtain short term targets and have emphasized economic benefits. On the contrary, various ecological functions of national parks, such as provider of oxygen, absorber of carbon dioxide and stabilizer of hydrology have rarely been appreciated for their direct value and not traded in markets. Indeed, there are knowledge gaps between the government policy makers and scientists in valuing and options for trading of natural ecosystem services.

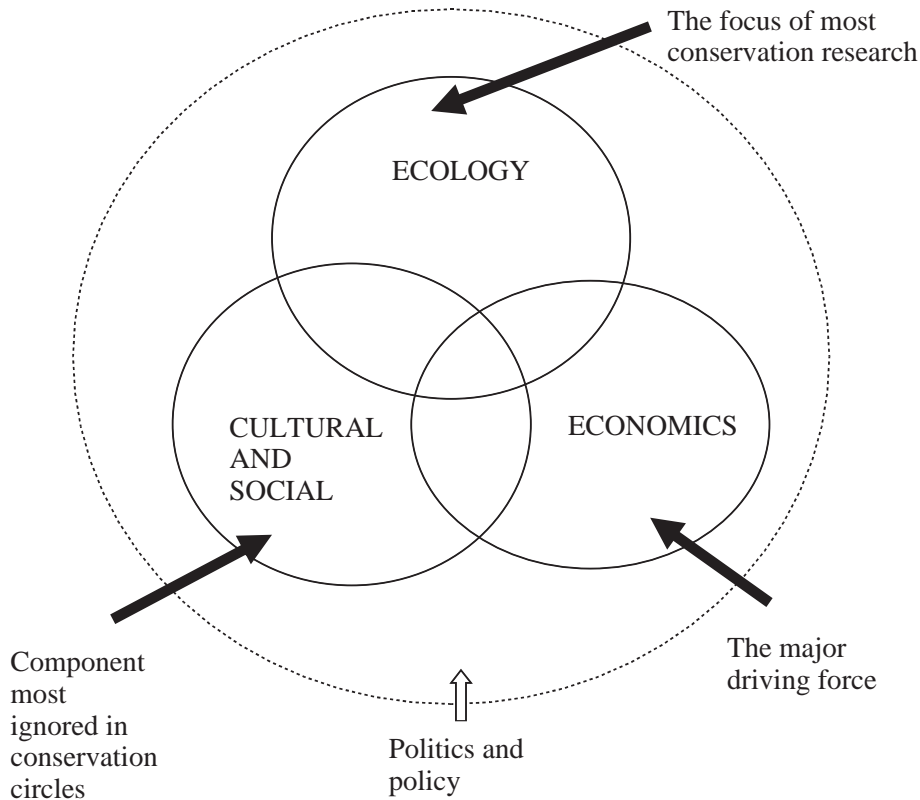
13.7 Sustainable Development of Transfrontier Protected Areas

Indonesia and Malaysia are recognised as centres for biodiversity and endemism (Mittermeir 1988 and Myers 1988, cited by Eaton 1996). To conserve genetic, species and ecosystem diversity in transborder regions, the Trans-boundary Biodiversity Conservation Area (TBCA) was established comprising Betung Karihun National Park (BKNP) of Kalimantan and Lanjak Entimau Wildlife Sanctuary (LEWS) of Sarawak in October 1994. In addition, Danau Sentarum National Park (DSNP) of West Kalimantan and Kayan Mentarang National Park (KMNP) of East Kalimantan and Batang Ai National Park (BANP) of Sarawak should also be integrated. To develop management plans for the TBCA and to enhance collaboration between Indonesia and Malaysia a Borneo Biodiversity expedition was organized between September and November 1997, sponsored by the International Tropical Timber Organization (Kuswanda et al. 1999; Chai 2000).

The TBCA, including BKNP, and DSNP and KMNP have not been spared disturbances, among others because conservation programmes have emphasized protecting wildlife and the needs of local people have been neglected. Thus, we agree with Lusigi (1981: 87) when he says that the conservation plans implemented in the developing countries were over protective of wildlife, because they were based on assumption that the developing countries are on the same line of the development as the industrialized nations, and therefore that conservation methods could be transplanted to suit the new environment. There was no assessment of local cultural values, local fears, or local needs. Similar arguments have also been given by Hamilton, head of International Plant Conservation unit WWF, United Kingdom (Cunningham 2001: xii). He mentions that conservation is directly linked to people's values and behaviour. It is therefore ironic that the people-conservation interface has been neglected in the past. Part of this neglected has been due to a lack of appreciation of the roles that knowledge, institutions and cultural perspectives of local people can play in resource management and conservation.

Thus, to achieve sustainable use of natural resources for supporting the sustainable development programmes of the transfrontier protected areas of Indonesia and Malaysia, ecological, economic, and socio-cultural dimensions must be integrated (Figure 13.2).

Figure 13.2 To achieve sustainable use of resources, ecology, economic, and cultural and social factors must be integrated in the sustainable development of nature conservation programmes. Source Cunningham (2001: 6).



This approach fits well with the principle of the sustainable development which has been adopted by the Indonesian government, particularly after the Earth Summit on the United Nations Conference on Environment and Development-UNCED in Rio de Janeiro, Brasil in 1992 (KLH 1997: iii). Village people who reside in surrounding conservation areas, including in BKNP, DSNP, and KMNP are very poor (c.f. Barber, Afiff and Purnomo 1997), therefore, the concept of Integrated Conservation and Development Project (ICDP) or Integrated Protected Areas Systems (IPAS) or Biosphere Reserves may be implemented with some appropriate improvements (cf. Wiranto et al. 2001). In general this programme has been implemented in some conservation areas in Indonesia, such as Kerinci Seblat National Park of Sumatera and Wasur National Park of Papua (Irian Jaya) which were supported by ADB, the World Bank, and USDA. These programmes, however, have met some constraints and have tended to fail. Various constraints, such as the planning and management of conservation in the field, can be overcome by following the ICDP approaches (Barber, Afiff and Purnomo 1997: 100). Various appropriate improvements of ICDPs can be made, including respecting, modifying and adopting traditional conservation initiatives, such as *tana'ulen*, *kampung galao* and *tuan palao*, and adopting traditional agroforestry. Sharing the management between Indonesia and Malaysia, and support from various local, national, and international stakeholders to maintain the TBCA must be enhanced.

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Part Three

**Tools and Policies for
Transborder Environmental
and Natural Resource
Management**

Socio-Economic Costs from Yellow Dust Damages in South Korea

Dai-Yeun Jeong

Abstract: Yellow dust, which is also termed Asian dust, yellow sand, yellow wind, or China dust storm, is a typical transborder environmental problem in Asia. It is a seasonal meteorological phenomenon which affects much of East Asia sporadically during the springtime months. The dust originates in the deserts of Mongolia and northern China and Kazakhstan where high-speed surface winds and intense dust storms kick up dense clouds of fine, dry soil particles. These clouds are then carried eastward by prevailing winds and pass over China, North and South Korea, and Japan, as well as parts of the Russian Far East. Sometimes, the airborne particulates are carried much further, in significant concentrations which affect air quality as far east as the United States. In the last decade or so, it has become a serious problem due to industrial pollutants and intensified desertification in China, as well as in the last few decades when the Aral region of Kazakhstan dried up due to a failed Soviet agricultural scheme. A lot of research on the impact of yellow dust as a transborder environmental problem has been done in South Korea, Japan, and Taiwan, etc. Most research has been done by natural scientists, focusing on the analysis of chemical constituents of yellow dust and/or its impact on the quality of water, air, soil, animal, and human health, etc. Quite few research has been done on yellow dust in terms of its impact on socio-economy. South Korea is geographically very close to the locus where yellow dust originates. This makes South Korea to be more serious than other countries in terms of the range and strength of damage from yellow dust. With such implications, the main objective of this paper is to estimate the socio-economic cost damaged from yellow dust in South Korea. To fill this aim, the paper will identify first how often and how densely yellow dust have occurred in a year during the past decade. Secondly, the paper will identify the socio-economic areas being damaged from yellow dust. Thirdly, the actual socio-economic cost damaged from yellow dust will be estimated. Finally, the paper will seek a possible regional cooperation strategies among North-East Asian countries for the reduction of damage from yellow dust.

14.1 Introduction

The implication of environmental problems are very wide, but the issue can be converged into the depletion of resources, pollution and/or the destruction of the original quality of nature, and as a result, a threat to the self-regulating mechanism of nature (Jeong 2000: 163). Environmental problems occur locally, but their impact may be global. In this sense, some environmental problems such as climate change, ozone depletion, and acid rains are termed transborder environmental problems. Goldblatt (1997) argues that such a transborder situation is the globalization of environmental problem.

Yellow dust, which is also termed Asian dust, yellow sand, yellow wind, or China dust storm, is a typical transborder environmental problem in Asia. It is a seasonal meteorological phenomenon which affects much of East Asia sporadically during the springtime months. The dust originates in the deserts of Mongolia and northern China and Kazakhstan where high-speed surface winds and intense dust storms kick up dense clouds of fine, dry soil particles. These clouds are then carried eastward by prevailing winds and pass over China, North and South Korea, and Japan, as well as parts of the Russian Far East. Sometimes, the airborne particulates are carried much further, in significant concentrations that affect air quality as far east as the United States. In the last decades or so, it has become a serious problem due to industrial pollutants and intensified desertification in China, but also in the last few decades when the Aral region of Kazakhstan dried up due to a failed Soviet agricultural scheme.

A lot of research on the impact of yellow dust as a transborder environmental problem has been done in South Korea, Japan, and Taiwan. Most research has been done by natural scientists, focusing on the analysis of chemical constituents of yellow dust and its impact on the quality of water, air, soil, animal, and human health (e.g. Kwon et al. 2002; Yabe et al. 2003; Wang et al. 2004; Ichinose et al. 2005; Kang and Lee 2005; Okuda et al. 2005; Lee et al. 2006). In addition, quite some research has been done on the socio-economic impact of yellow dust.

South Korea is geographically very close to the place where yellow dust originates. This makes South Korea more

than other countries susceptible to the damage from yellow dust. The objective of this paper is to estimate the socio-economic cost from yellow dust in South Korea. The paper will explain first how often yellow dust has occurred per year during the past decade. Second the paper introduces the methods used to estimate the socio-economic cost of yellow dust. Third, this socio-economic cost will actually be estimated. Finally, as a conclusion, the paper will examine the implications of the estimation techniques and the estimated socio-economic cost.

14.2 The Yellow Dust Phenomenon

A Historical Record

Korea has a history of 4,350 years. The first Dynasty that governed Korea was the Ancient Josun Dynasty, founded in 2333 BC. It was overrun in 1122 BC by Kija, a Chinese scholar, and his Dynasty lasted until 108 BC. Korea was divided into three Kingdoms – Gogurye, Silla, and Baekje, but united again by Silla in 677. The Goguryeo Dynasty took over in 936 while General Yi established his own Dynasty in 1392. This Dynasty lasted until Korea became under Japanese colonial control from 1910 to 1945. After World War II Korea was divided into North and South at the 38th parallel. The three year Korean War began in 1950 when North Korean tanks rolled across the 38th parallel, attempting to quickly unite the country by force.

The first record of yellow dust is from the Silla Dynasty in 174. Yellow dust was called soil rain, and the people believed that God had become so angry that he lashed down dirt instead of rain or snow. The following record is from the Baekje Dynasty in April 379: “Dust fell all day long.” An additional record from March 606 states that the sky of the Baekje’s capital was darkened like night by falling dust.

Although these dust phenomena mainly occur during springtime, some records mention occurrences in winter as well. During the Goguryeo Dynasty in October 644, it was recorded that there was a red snow that fell from the sky, suggesting that yellow dust had mixed with snow at the time. The definition of the yellow dust event was introduced in the reign of Gorye as follow: “There was dirt on clothes without getting wet by rain.” Hence it was called soil rain.

During the Yi Dynasty, on March 22, 1549 the following notes were recorded: “Dust fell in Seoul. At Jeonju and Namwon in the Jeonla province, located in the southwestern part of Korea, there was a fog that looked like smoke creeping into every corner in all directions. The tiles on the house roof, grasses and tree leaves were entirely covered by yellow-brown and white dusts. When the dust was swept, it wiped away like dirt, and when it was shaken, it dispersed, too. This weather condition lasted until March 25, 1549.”

The Frequency of Yellow Dust

South Korea’s Government runs 22 observation sites throughout the whole country to measure yellow dust. Table 14.1 shows the frequencies of yellow dust occurrence from 1997 to 2006 in seven major cities (MOESKG 2007).

Table 14.1 Frequencies of yellow dust occurrence 1997 - 2006 in major cities

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
City										
Seoul	1	3	3	6	7	7	2	4	9	7
Gangnung	1	2	1	3	7	6	2	3	3	6
Daejeon	1	3	2	4	7	6	2	6	5	6
Daegu	1	2	2	5	8	5	2	5	3	7
Jeonju	1	2	1	6	10	6	1	6	5	4
Gwangju	1	2	2	6	7	6	1	6	5	5
Busan	1	2	1	6	8	5	0	4	2	6

As shown in Table 14.1, the frequencies of yellow dust occurrence during the past ten years show a trend of increase in all the seven cities. The frequencies were not significantly different among the cities during that period. The days of yellow dust occurrence have increased every year (MOESKG 2007). For example, its average was 3.9 days in the 1980s, 7.7 days in the 1990s, and 12.4 days since 2000. The maximum density has also increased every year

(MOESKG 2007), from $356\mu\text{g}/\text{m}^3$ in 2000, to $600\mu\text{g}/\text{m}^3$ in 2003, and $2,941\mu\text{g}/\text{m}^3$ in 2006. Spring is the main season yellow dust occurs but since 2000, yellow dust also occurs in winter.

Research has shown that the increase in the frequency and density of yellow dust in South Korea are related to the high atmospheric pressure in Siberia and the temperature in the Northern hemisphere (Kim and Lee 2006). Yellow dust days show negative correlation with Siberian high atmospheric pressure in February and March. When Siberian high atmospheric pressure becomes weak in spring, the possibility of yellow dust occurrence becomes high. Meanwhile, yellow dust days had a positive correlation with monthly average temperatures of the Northern hemisphere, especially, in the case of strong yellow dust days. Global warming, therefore, might positively affect the occurrence of strong yellow dust days.

14.3 Estimation Methods of Socio-Economic Costs

Input-Output Analysis (IOA)

IOA is one of a set of related methods that show how all the parts of a system are affected by a change in one part of that system (OECD 2006: 7-8). IOA is used, for instance to show industries and their input and output links. For example, in the case of coal and steel producing industries, while coal is required to produce steel, some amount of steel in the form of tools is also required to produce coal. Hence, IOA is a tool of applied equilibrium analysis. IOA is widely used in economic forecasting to predict the effect of changes in one industry on others, or to predict changes among consumers, government, and foreign suppliers in a particular economy. IOA can be applied to estimate the socio-economic cost from yellow dust by evaluating both tangible and intangible socio-economic impacts of yellow dust at regional and/or national level.

Some scholars have applied IOA to the analysis of environmental problems like energy flows and air pollutants (e.g. Hayami and Kiji 1997), the economic costs from yellow dust (e.g. Ai and Polenske 2005), and the emission of CO_2 and greenhouse gases (e.g. Hayami et al 1997; OECD 2006: 29-32).

Applying IOA to estimate the economic cost of yellow dust is appropriate given that decreased demand from affected sectors (e.g. households) may diminish production in other sectors and analysts may trace the demand-driven effects on a region's and/or a country's output by the changes in final demand.

Integration of Environmental-Economic Evaluation Technique (IEEET)

IOA can't capture all the economic impacts of yellow dust, because some sectors apparently affected by yellow dust may not change the demand from other industries. IEEET is a technique for capturing non-economic or environmental aspects of yellow dust (for details, see Ai and Polenske 2005). IEEET includes Dose-Response Analysis (DRA), Market-Value Method (MVM), and Human-Capital Method (HCM). DRA is a component of risk assessments that describe the quantitative relationship between the amount of exposure to a substance and the extent of toxic injury or disease caused by such a substance. Hence, DRA estimates the number of people affected and corresponding workday losses by examining the change in the concentration of toxicity during yellow dust. MVM evaluates economic impacts by multiplying the losses in productivity by the market value. HCM ascribes a money value to the health impacts on working people exposed to environmental pollution. Thus, applying HCM to yellow dust, it is possible to measure the economic losses of workdays interrupted during yellow dust.

Synthesizing DRA, MAV, and HCM, we firstly rely on dose-response functions to estimate the total number of workday losses. Then we multiply the result by the value that the workers would have produced per day if yellow dust had not occurred, using gross domestic product per capita per day as a substitute.

Contingent Valuation Method (CVM)

CVM is a survey-based economic technique for the valuation of non-market resources such as environmental preservation or the impact of contamination (Carson 2000; Groothuis 2005; Kimenju 2005). While these resources do give people utility, certain aspects of them do not have a market price as they are not directly sold – for example, people receive benefit from a beautiful view of a mountain, but it would be tough to value using price-based models (Kim 2002).

CVM refers to the method of valuation used in cost-benefit analysis and environmental accounting. It is condi-

tional (contingent) on the construction of hypothetical markets, reflected in expressions of the willingness-to-pay for potential environmental benefits or for the avoidance of their loss. Thus, CVM is a method of estimating the value that a person places on a good in hypothetical situations. The approach asks people to directly report their willingness-to-pay (WTP) to obtain a specified good, or willingness-to-accept (WTA) to give up a good, rather than inferring them from observed behaviors in regular market places (Frykblom 2000; Ryan and Miguel 2000; Goldar and Misra 2001; Venkatachalam 2004). Where CVM is applied to environmental problems, through a questionnaire the hypothetical situations are presented to a representative sample of the relevant population in order to elicit statements about how much they are willing to pay for a benefit and/or willing to accept in compensation for tolerating a cost.

The main stages in the application of CVM are as follows. (1) Define the good and the change in the good to be valued. (2) Define the geographical scope of the market. (3) Set up the hypothetical market. (4) Conduct focus groups on components of the survey. (5) Conduct a pretest of the survey instrument (questionnaire). (6) Conduct a sample survey. (7) Calculate average WTP or WTA. (8) Estimate bid curves and (9) evaluate the CVM exercise.

There are a number of techniques that have been used in the CVM to estimate the non-marketed value of any specific environment amenity or scenic resources. These include direct cost, revealed demand and bidding game. Direct cost is a method of estimating the non-marketed benefit of reduced environmental damage based on direct estimate of the cost to be projected from that damage (Randal et al. 1994). Revealed demand is a technique to infer the non-marketed benefit from the revealed demand for some appropriate proxy. In the case of reduced air pollution, the revealed demand for residential land is related to the concentration of air pollution (Randal et al. 1994). Bidding game is also a technique of estimating the non-market benefit of improved environmental quality or establishment of recreation sites (Knetsch and Davis 1966).

Like other research techniques, CVA has some methodological problems (for details, see Venkatachalam 2004; Andersson and Svensson 2006). However, CVA is applied to a wide range of empirical research. The examples include yellow dust (e.g. Hong 2004; Kang et al. 2004; Ai and Polenske 2005), climate change (e.g. Berk and Fovell 1999), ozone pollution control policy (e.g. Yoo and Chae 2001), ecosystem services (e.g. Loomis 2000), biodiversity (e.g. Macmillan et al. 2001), endangered species (Kotchen and Reiling 2000), health care (Bonato et al. 2001; Johannesson 2006), clean air (e.g. Belhaj 2003), and water resources (e.g. Phuong and Gopalakrishnan 2003).

Bottom-Up Approach (BUA)

Top-Down and Bottom-Up approaches are strategies of information processing and knowledge ordering, mostly involving software, and by extension other humanistic and scientific system theories. The two approaches are applicable to wider ranges of humanistic and scientific system theories than the techniques explained above.

In a top-down approach an overview of the system is first formulated, specifying but not detailing any first-level subsystems. Each subsystem is then refined in yet greater detail, sometimes in many additional subsystem levels, until the entire specification is reduced to base elements. Top-down model is often specified with the assistance of 'black boxes' that make it easier to manipulate. However, black boxes may fail to elucidate elementary mechanisms or be detailed enough to realistically validate the model.

In a bottom-up approach the individual base elements of the system are first specified in great detail. These elements are then linked together to form larger subsystems, which then in turn are linked, sometimes in many levels, until a complete top-level system is formed. This strategy often resembles a 'seed' model, whereby the beginnings are small, but eventually grow in complexity and completeness.

For example, the bottom-up approach focuses on a specific company rather than on the industry in which that company operates or on the economy as a whole, and assumes that individual companies can do well even in an industry that is not performing very well. Applying such bottom-up approach to the socio-economic cost from yellow dust, all the areas and items damaged from yellow dust are listed, and their costs are estimated, and then are summing up (Kang et al. 2004: 28).

The bottom-up approach also has some limitations that: BUA is usually formulated without explicit reference to an economic scenario. Moreover, where tests rely on historical events, BUA may not capture effectively the future changes in the economic environment that will affect the portfolio performance. The use of sophisticated modeling techniques could also create a false scene of security and complacency without a thoughtful analysis of current and prospective economic conditions.

Benefit Transfer Method (BTM)

Increased use of economic analyses in environment, transport, energy, health and cultural sectors has increased the demand for information on the economic value of environmental and other non-market goods by decision-makers. Due to limited time and resources when decisions have to be made, new environmental valuation studies often can't be performed, and decision makers must rely on transfer of economic estimates from previous studies (often termed 'study sites') of similar changes in environmental quality to value the environmental change at the 'policy site'. This procedure is most often termed 'benefit transfer', but damage estimates can also be undertaken (Groothuis 2005).

Benefit transfer is a pragmatic way of estimating values for environmental or social tradeoffs when there is limited time or funding available, and BTM is used to estimate economic values for ecosystem services by transferring available information from studies already completed in another location and/or context. However, the term 'benefit transfer' is normally used to identify the transfer of non-market values from source studies to a target site. Thus, the basic goal of benefit transfer is to estimate benefits for one context by adapting an estimate of benefits from some other context.

BTM was developed as an alternative way to value externalities using values from studies of similar circumstances, carried out at similar sites somewhere else, given the challenges and high costs inherent in assessing the actual cost. Four BTMs have been developed. They are benefit estimate transfer, benefit function transfer, meta-analysis, and preference calibration (Groothuis 2005). Benefit estimate transfer is the simplest; it is when researchers obtain a benefit estimate from one study and transfer the estimate directly to the policy site on the basis of mean 'willingness-to-pay'/household/year. This approach is based on 'the unit day approach' where existing values for activity days are used to value the same activity at other sites, and assumes that the well-being experienced by an average individual at the study site is the same as will be experienced by the average individual at the policy site.

Benefit function transfer and meta-analysis, which use only one study, but more information is effectively taken into account during the transfer, employing statistical models from existing studies while using policy information to control differences between the study site and the policy site. The main difference between benefit function transfer and meta-analysis is that the former transfers a valuation, allowing adjustment for variety of site differences, while the latter combines the results of several studies to generate a pooled model. Preference calibration, on the other hand, uses existing benefit estimates derived from different methodologies and combines them to develop a theoretically consistent estimate for the policy site.

Brouwer (2000) proposes a detailed seven-step protocol as a first attempt towards good practice for using BTM. The steps may be generalized as follows. Step 1 is to identify existing studies or values that can be used for the transfer. Step 2 is to decide whether the existing values are transferable. Step 3 is to evaluate the quality of studies to be transferred. The better the quality of the initial study, the more accurate and useful the transferred value will be. This requires the professional judgment of the researcher. Step 4 is to adjust the existing values to better reflect the values for the site under consideration, using whatever information is available and relevant. The researcher may need to collect some supplemental data in order to do this well. For example, the sites valued in each of the existing studies differ from the site of interest. The researcher might adjust the values from the first study by applying demographic data to adjust for the differences in users. If the second study has a benefit function that includes the number of substitute sites, the function could be adjusted to reflect the different number of substitutes available at the site of interest.

Like other research techniques, BTM has advantages and limitations. Its major advantages are (Ruijgrok 2001; Groothuis 2005; Ready and Navrud 2006): (1) BTA is typically less costly than conducting an original valuation study; (2) economic benefits can be estimated more quickly than when undertaking an original valuation study; and (3) BTM can be used as a screening technique to determine if a more detailed, original valuation study should be conducted.

However, transfer processes can be complex to avoid potential sources of error in the extrapolation of values to sites or issues of interest. In relation to the potential sources of error, the major limitations of BTM are summarized as follows (Ruijgrok 2001; Groothuis 2005; Ready and Navrud 2006): (1) Benefit transfer may not be accurate, except for making gross estimates of values, unless the sites share all of the site, location, and user specific characteristics. (2) Good studies for the formulation of policies may not be available. (3) It may be difficult to track down appropriate studies, since many are not published. (4) Reporting of existing studies may be inadequate to make the needed adjustments.

A lot of empirical research has been done, applying BTM to environmental contexts. Recent applications include

Rozan (2004) on improved air quality in France and Germany, Muthke and Holm-Mueller (2004) on national and international transfers of water quality improvement benefits, Jiang et al. (2005) on coastal land management, Colombo, Eshet et al. (2006) on disamenities of waste transfer stations in Israel, and Colombo et al. (2007) on the off-site impacts of soil erosion.

14.4 Socio-Economic Costs from Yellow Dust

It is known that 20 million tons of yellow dust is generated from the place of origin every year, and 5.50 - 9.50 million tons are brought in by air into the Korean peninsula. Yellow dust impacts negatively on nature, society, and human healthy (UNEASC 2004). Recent research has identified that yellow dust has some positive impacts on nature (Hong 2004; Ai and Polenske 2005; NIESKG 2007), because it absorbs solar radiation and off-sets global warming, prevents the red tide through the neutralization of sea water, neutralizes acid rain and soil acidity through its alkaline ingredients, increases the productivity of marine plankton and plants by providing nutrition such as calcium and iron, prevents the occurrence of photochemical smog, and strengthens the microorganisms in soil to absorb inorganic salts. In addition, Krupnick and Portney (2001) argue that the benefits in investments to reduce the negative effects from yellow dust exceed its cost.

This paper focuses on estimating socio-economic cost from yellow dust in South Korea. The socio-economic cost in Beijing, China has been analyzed, using the technique of input-out analysis (e.g. Ai and Polenske 2005). The socio-economic cost from yellow dust may be estimated in a wide range of areas in society.

Data Collection and Estimation Method

Recent research to estimate the socio-economic cost from yellow dust in South Korea includes work carried out by Hong (2004), Kang et al. (2004), and Shin (2005). These researchers have completed nation wide estimates, but they use different reference year and estimation methods, and vary in the socio-economic area included in the estimation. The differences are summarized as Table 14.2.

Table 14.2 Estimation of socio-economic cost from yellow dust damage in South Korea

Scholar	Year of Data Collection	Methods used	Type of consequence
Hong	2002	BTM	all socio-economic areas
Kang et al.	2002 and 2004	CVM	decrease in amenity increase in disease product purchase for preventing the damage from yellow dust others (washing car, cloth, etc)
		BUA	early death resulting diseases aviation transportation
		BTM	all socio-economic areas
Shin	2004	CVM	decrease in amenity increase in diseases product purchase for preventing the damage from yellow dust others (washing car, cloth, etc)

Note: BTM; Benefit Transfer Method; CAM; Contingent Valuation Method;BUA; Bottom-Up Approach

As is shown in Table 14.2, Kang et al.'s research is more comprehensive than the other two in terms of the socio-economic areas being analyzed and analytic method being used. Shin's research uses the most recent data. Hong estimated first the socio-economic cost per kilogram of yellow dust from Taiwan. Then, he estimated the socio-economic cost in South Korea, using a benefit transfer method. Kang et al. used three estimation methods. As part of their contin-

gent valuation method, they conducted a survey with 1,000 samples of people aged 20-59 selected through purposive quota sampling on a national base in the year of 2004. Their questionnaire included 35 items related to yellow dust, such as awareness of the damage, perception on its seriousness, experiences with yellow dust damage in the past five years, the real damages the samples had in the past five years, and willingness-to-pay (WTP) for restoring ecosystem damages from yellow dust. As part of their bottom-up approach, they estimated the actual expenses in relation to the damage from yellow dust in the areas like medical treatment, industry, transportation, and product purchase for preventing the damage from yellow dust. They estimate total costs, adding expenses in each area. As part of their benefit transfer method, they used costs per kilogram of yellow dust estimated by the EC (1999) and Markandya (1998), and then transferred the average to South Korea.

Shin used a contingent valuation method. Like Kang et al., he conducted a survey with a 1,000 samples of persons aged 20-59, selected through purposive quota sampling in the year of 2004. The questionnaire included similar questions as in the work of Kang et al. (2004).

Estimated Socio-Economic Cost

Socio-economic Cost Estimated by Contingent Valuation Method. Kang et al. (2004) estimated the socio-economic cost assuming that yellow dust occurs an average 14 days per year. They first estimated the socio-economic cost per person, and multiplied this for the whole population and total cost. As is shown in Table 14.3, the cost was estimated as US\$29.51 per person a year. Multiplied by total number of people in Korea an estimated cost of US\$ 44.123 million results. The total socio-economic cost is then estimated as US\$ 5,921.639 million when a discount rate of 7.5% is applied.

Table 14.3 Socio-economic costs of yellow dust, using cost per person estimates

Unit of Estimation	Cost Estimated
Cost per Person a Year (US\$)	29.51
Cost Based on Whole Population a Year (US\$ million)	44.123
Total Cost a Year (US\$ million)	5,921.639

The total cost per year was estimated by the socio-economic areas on the basis of their composition ratio which was calculated from the response on the willingness-to-pay in the sample survey. As is shown in Table 14.4, the willingness-to-pay was composed of 33.8% for decrease in amenity, 36.6% for increase in disease, 14.5% for purchasing product for preventing the damage from yellow dust, and 15.1% for others such as washing car and cloth.

Table 14.4 Break down of costs per socio-economic area

Socio-economic area	composition ratio (%)	socio-economic cost (US\$ million)
Decrease in amenity	33.8	2,001.514
Increase in disease	36.6	2,167.320
Purchase to preventing damages	14.5	858.638
Others (washing car, cloth, etc)	15.1	894.168
Total	100.0	5,921.639

Shin conducted the sample survey one year after Kang et al.'s fieldwork, using the same socio-economic areas. However, the cost estimated by socio-economic area was not significantly different.

Socio-Economic Cost Estimated by the Bottom-Up Approach. Kang et al. (2004) applied the bottom-up approach to estimate socio-economic costs from yellow dust in three areas: early death, cause of disease, and aviation.

1) The number of early deaths was measured by the number of death caused by yellow dust for a year in 2002 among cardiovascular and respirator patients, yielding a number of 164.81 persons. The number of early death was multiplied by the value of human life per person (US\$ 498,150) in South Korea, a value that was calculated through

willingness-to-pay estimate (Shin and Cho 2003). The total socio-economic cost caused by early death was estimated as US\$ 82.1 million.

2) There are three kinds of medical treatments of diseases caused by yellow dust. One is simply to take medicine not prescribed by doctors. Another one is day-by-day treatment in hospitals or by visiting doctors. The other is in hospital treatment. Kang et al. (2004) estimated the cost of the latter two treatments. The dates and number of day-by-day and hospitalized patients was collected per disease. Expenses for day-by-day patient medical treatments and medicine expenses per patient were collected per disease. For the hospitalized patient, total treatment expenses were collected by disease. In addition, doctor's time spent on the treatment of patients was calculated and estimated as a monetary expenses, using a US\$ 9.32 per hour cost and an average time of 20.3 minutes consumed for treating a single patient (MLSKG 2002). Based on these data, the total socio-economic cost has been estimated in Table 14.5.

Table 14.5 Socio-economic cost by disease

Disease	Treatment (US\$ million)	Time-Loss (US\$ million)	Total (US\$ million)
Ophthalmological	0.79	0.15	0.94
Cardiovascular	0.62	0.03	0.65
Otorhinolaryngological	15.54	3.28	18.82
Respiratory	14.89	2.27	17.16
Total	31.84	5.73	37.57

As is identified from Table 14.5, the socio-economic cost caused by diseases is US\$ 37.57 million. 90% arises for the treatment of patients and 10% for time-loss. Otorhinolaryngological diseases contributed most to the costs, followed by respiratory diseases; both contributed 95% to the total cost. This means the two are remarkably more sensitive to yellow dust than the ophthalmological and cardiovascular disease.

3) Aviation: There are two airlines in South Korea. They carry passengers and commodities domestically and internationally. The costs for the aviation industry from yellow dust are as decrease in sales due to flight cancellations. The decrease in sales is carried by airline companies, airport companies, and maintenance companies. Kang et al. (2004) estimated these costs for 2002 when 102 flights were cancelled due to yellow dust.

Table 14.6 Socio-Economic cost of airline transportation

Analytic Items	Airline company	Airport company	Airplane-maintenance Company	Total (US\$)
Cancellation of flight Items included in analysis	102 Loss of sales volume from passenger Loss of sales volume from commodity Cost by cancellation of passenger and commodity	102 Loss from landing charge Loss from lighting Loss from airport- use tax Loss from car parking	102 Loss of sales volume from passenger Los of sales volume from commodity	
Total cost Estimated	497,616	48,380	31,975	577,971

As is shown in Table 14.6, the cancellation of 102 flights caused a total cost of US\$577,971. Airline companies suffered 86.0% of these costs followed by airport companies and maintenance companies.

Socio-Economic Cost Estimated by Benefit Transfer Method. The socio-economic costs estimated through the benefit transfer method (BTM) have been done by Hong and Kang et al. in South Korea (Table 14.2). The BTM requires existing research result applicable to a new research site. Hong used the cost estimated by Markandya (1998) while Kang et al. used the cost estimated by both Markandya (1998) and EC (1999). EC (1999) and Markandya (1998) estimated the average cost from particulate matter per kilogram as US\$ 15.15 and US\$ 27.98 respectively. Thus, the cost estimated through BTM does not allow an identification of costs for separate socio-economic areas. Therefore, Hong and Kang et al.'s estimation only total socio-economic costs. They multiply the quantity of yellow dust deposited in South Korea by the average cost per kilogram. Hong estimated this cost per month, while Kang et al. estimated it by particle size. Tables 14.7 shows Kang et al.'s estimation, which includes Hong's estimation.

Table 14.7 Cost by particle size when EC and Markandya's estimations are transferred

Particle Size(μg)	Average Cost (US\$ one million)	
	Transfer from EC	Transfer from Markandya
0.20 – 0.50	0.87	1.6
0.51 – 0.82	1.17	2.13
0.83 – 1.35	3.26	6.02
1.36 – 2.23	21.49	39.70
2.24 – 3.67	285.68	527.65
3.68 – 6.06	1,242.30	2,294.52
6.07 – 10.00	2,398.20	4,429.55
Total	3,952.97	7,301.19

Table 14.7 shows that cost estimates differ according to what existing data are used, suggesting that BTM is a less reliable method to estimate these costs, compared to contingent valuation or the bottom-up approach. However, BTM estimates more holistic socio-economic cost than contingent valuation method and bottom-up approach because these two methods are confined to particular socio-economic areas selected by the researchers. Regardless of which data are used in the BTM methods, the particle size of yellow dust between 3.68 μg to 10.00 μg occupies 92% of the total socio-economic costs. Meanwhile, the particle size less than 1.35 μg causes very low socio-economic costs.

14.5 Concluding Remarks

Yellow dust may reach every corner of South Korea and affect almost all socio-economic areas. The South Korean Government runs 22 observation sites for measuring it throughout the whole country. The frequencies of yellow dust occurrence during the past ten years show a trend of increase in terms of the days of yellow dust and the maximum density. The increase is significantly related to the high atmospheric pressure in Siberia and the temperature in Northern hemisphere.

Research techniques have been developed to estimate the socio-economic cost from yellow dust damage. They include input-output analysis, integration of environmental-economic evaluation technique, contingent valuation method, bottom-up approach, and benefit transfer method. Each technique has strong and weak points.

Three South Korean scholars have estimated the socio-economic cost from yellow dust, using these techniques. As is shown in Table 14.8, the total socio-economic cost from yellow dust damage in South Korea in the year of 2002 is estimated as US\$ 3,900 million at minimum and US\$ 7,300 million at maximum. The average of the two, US\$5,600 million, is equivalent to 0.8% of GDP and US\$ 117.00 per South Korean inhabitant.

The benefit transfer method results in the highest socio-economic cost, followed by the contingent valuation method and the bottom-up approach. However, there is a possibility for both contingent valuation method and the bottom-up approach to underestimate because the two do not cover all socio-economic areas. Meanwhile, the benefit transfer method has a possibility to underestimate and overestimate as well in that the technique relies on the aver-

age cost obtained from other research sites. From such a methodological point of view, it is difficult to conclude which technique can estimate more accurately the socio-economic costs from yellow dust.

More reliable estimates may be done if the following is considered. (1) Common disaster-assessment techniques may not be applicable to evaluate the socio-economic impacts of yellow dust unless full data is available. However, analysts can gather data only from limited published information or field surveys. The lack of data is the most serious limitation to accurately estimate socio-economic costs from yellow dust. Thus, it is very important that the Government or private organizations collect better data on more areas, including loss of teaching in schools that are interrupted by yellow dust.

In addition, a time-series estimation of this data is necessary rather than ad hoc estimation in a given year. This is because the density and the continuous days of yellow dust vary between years. And finally, yellow dust has some positive impacts on nature and society, and these benefits should also be estimated. If this is done, a more balanced estimate of socio-economic cost from yellow dust damage will be possible.

Table 14.8 Summary of the estimates of socio-economic cost from yellow dust in South Korea

Analytic technique	Socio-Economic Area	Socio-Economic Cost Estimated (US\$ million)	Remark
Contingent valuation method	Decrease in amenity	2,001.514	
	Increase in disease	2,167.320	
	Product purchase for preventing damages from yellow dust	858.638	
	Others (washing car, cloth, etc)	894.168	
	Sub-total	5,921.639	
Bottom-up Approach	Early death	82.100	
	Ophthalmological disease	0.940	
	Cardiovascular disease	0.650	
	Otorhinolaryngological disease	18.820	
	Respiratory	17.160	
	Aviation industry	0.578	
	Sub-total	120.688	
Benefit transfer method	The whole area	3,952.97	Transfer from EC
	The whole area	7,301.190	Transfer from Markandya

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Multilateral, Bilateral and Regional Aspects of International Cooperation in Environment Protection of China

He Shengda

Abstract: This article gives an account of the processes and contents of the bilateral and regional international environmental cooperation that China has so far participated in. It especially focuses on analyzing the progresses, experiences and existing problems in such cooperation and gives comments and policy recommendations on it. Three of the main foci of the article are: First, the article sets forth that environmental cooperation is an important aspect of China's active participation in international cooperation. The guiding principle of China's participation is to seek to "develop the bilateral (cooperation), strengthen the multilateral (cooperation), stabilize the neighboring (countries) and explore the nongovernmental (approaches)". Secondly, the article explains that bilateral cooperation has become the most active approach that China takes to participate in international environmental cooperation. Since 1992, China has reached agreements with 40 countries from Asia, Europe, America, Africa and Oceania on bilateral environmental protection. These countries include Russia, Japan and U.S.A. but European countries come first in numbers. These cooperation cover all relevant areas like pollution treatment, ecological protection and environmental security, and play an active role in environmental protection in China and other countries. Thirdly, the article discusses both the bilateral and multilateral regional environmental cooperation that China has taken part in. China regards environmental protection as an important component of promoting regional sustainable development and takes an earnest attitude of "overall involvement, emphasized input, active engagement, gradual progress, mutual benefit and open space" in its participation. A basic framework has been formed focusing on cooperation with neighboring countries and cooperation at inter-regional level.

15.1 Introduction

There is only one earth for the entire human population. The contemporary condition of economic globalization had promoted the steady economic development in various countries and different regions while existing environmental problems kept worsening and new ones continue to emerge. The only solution for the world environmental challenges is to strengthen, expand and deepen international cooperation in environmental issues and promote global sustainable development.

China's economy has rapidly developed for almost 30 years since the country started its reform and international engagement. These changes have created an economic development miracle unprecedented among other larger countries in the world. However, various environmental problems that already occurred in western developed countries during the last century have now also appeared in China. They have led to equally unprecedented destruction of habitats.

The Government has realized the importance of environmental problems in China, and has turned to development policies based on scientific understanding, while promoting a resource-saving and environment-friendly society. The Government also has realized that to solve domestic environmental problems, international cooperation is needed.

It is undeniable that China is a large country and needs to occupy a pivotal position in the world's environment and development affairs. As a significant part of the country's international cooperation, China's environmental technical assistance plays an important role in the world's environmental protection. China's international environmental cooperation can be categorized as: participation in global multilateral cooperation, development of bilateral cooperation, and reinforcement in regional as well as trans-regional multilateral cooperation.

15.2 China Participation in Global Environmental Cooperation

China has an impressive record in promoting global environmental cooperation. Since 1972, China has sent many high-ranking delegations to meetings of the United Nations Commission on Sustainable Development, the World

Summit on Sustainable Development and corresponding preparatory activities. In its cooperation with the United Nations Environment Program, China has made fruitful progress to: combat desertification, protect the ozone layer, conserve biodiversity, promote a clean production and a recycle economy, implement environmental education and training, combat land pollution and protect the sea through concerted global action. China has promoted international development through effective cooperation with the United Nations Development Program, the World Bank, the Asian Development Bank and other international organizations.

China is an active supporter of international agreements, for instance through active participation in the United Nations Framework Convention on Climate Change, the Kyoto Protocol, the Montreal Protocol on Loss of Ozone Materials, the Stockholm Convention on Persistent Organic Pollutants, the Convention on Biological Diversity, the United Nations Convention to Combat Desertification, as well as 50 other international treaties related to environmental protection. China has persistently complied with its obligations under these treaties with great enthusiasm.¹

15.3 China Bilateral Environment Cooperation

The principle that applies to international affairs is that a nation (or state) has the leading rights and obligations to undertake international environmental cooperation. China has adopted a set of effective measures to solve domestic environmental problems and has taken active and practical attitudes to participating in bilateral cooperation and environmental protection under the guidelines of: developing bilateral cooperation, strengthening multilateral cooperation, stabilizing cooperation with neighboring region and exploiting civilian cooperation.

Bilateral environmental cooperation has developed favorably since China started its environmental diplomacy, and China has signed bilateral environmental protection cooperation agreements and memorandums with the United States of America, Japan and over 40 other countries. It furthermore has helped to promote bilateral communication. Active bi-directional exchange visits at ministerial level, the establishment of joint committees on bilateral environmental cooperation and foreign staff training abroad have taken place. The bilateral environmental cooperation partners of China have spread all over the world, and the foci of such cooperation include environmental policies and law, pollution prevention, nuclear security, biodiversity conservation, climate change, sustainable production and consumption, capacity building, demonstration projects, environmental technology and environmental protection industry.

The "Collection of Documents on Bilateral Environmental Cooperation" by the country's State Environmental Protection Administration compiled more than 50 cooperative documents signed between China, Russia and 36 other countries. A total 18 out of 37 countries that had signed bilateral environmental cooperation documents with China, are European countries (Russia, Ukraine, Poland, France, Britain, Bulgaria, Romania, Italy, Germany, Netherlands, Belgium, Slovak, Sweden, Spain, Czech, Hungary, Iceland and Finland). In addition, 11 Asian countries signed such agreements: Four Northeast Asia countries (Mongolia, DPRK, South Korea and Japan), two middle Asia countries (Tadzhikistan and Uzbekistan), one West Asia country (Iran) and two South Asia Countries (Pakistan and Sri Lanka), and two Southeast Asia countries (Thailand and Singapore). Furthermore, five American countries (USA, Canada, Brazil, Peru and Cuba) had signed bilateral environment cooperation documents with China. Two countries from Africa (Egypt and Morocco) and Australia signed agreements. Among the 37 countries that signed environmental agreements, eight border with China either via land or via the sea, namely Russia, Mongolia, Japan, DPRK, South Korea, Tadzhikistan, Uzbekistan and Pakistan.

The active attitude of China in developing bilateral environmental cooperation has had significant impact on solving environmental problems, promoting the development of domestic environmental protection industries and strengthening mutual cooperation with other countries. The environmental cooperation with developed countries helped China to gain financial support and to import new technologies. It also provided secure channels for China to draw on the experiences of other countries in environmental control, administration, legislation and regulation and so on. The environmental cooperation with developed countries promoted the relation between China and these countries, encouraged sharing of experiences and supported otherwise multilateral environmental cooperation. It also provided necessary conditions to open foreign markets for the Chinese environmental protection industry.

1. The Information Office of the State Council, People's Republic of China: Environment Protection of China (1996-2005), People's Daily, June 6th of 2006.

15.4 Bilateral Environmental Cooperation between China and Japan

Over half of the bilateral environmental cooperation in China was developed between China and developed countries. The cooperation between China and Japan has been one of the most active and largest in terms of scale, and it has achieved the important results.² It can be looked upon as a typical case of bilateral environmental cooperation between China and the developed countries. Some of the achievements are discussed below.

As early as in 1977, a Japanese environmental delegation already visited China. In 1988, on his visit to China the Japanese Prime Minister at that time, Noburo Takeshita, signed a bilateral agreement to establish the “Sino-Japan Friendship Center of Environmental Protection” project. According to the Agreement, the Government of Japan provided a 10.5 billions Yen grant for this project. This project played an important role in pollution control, environmental supervision, information exchange and so on.

The function of conferences and forums has been maximized. In May of 1994, the two governments signed the “Agreement of Environmental Protection Cooperation”. In December of the same year, the first session of the Sino-Japan environmental cooperation joint committee was held and it has since been convened annually. In 1996, China and Japan worked together to establish the integrated forum of Sino-Japan environmental cooperation.

The implementation of the cooperative project was guaranteed with a government joint communiqué. In November of 1998, the Chinese government and the Japanese government signed “The Sino-Japan Joint Communiqué towards the Environmental Protection Cooperation in the 21st Century”. In that joint communiqué, the two governments announced cooperative projects (such as the demonstration city of Sino-Japan environment cooperation, construction of an environmental information system, a Sino-Japan environmental cooperation joint committee, the integrated forum of Sino-Japan environment cooperation and so forth.³

Environmental Cooperation was actively developed through multiple channels. For instance, a Japanese Loan Project started in 1980 and was implemented extensively after 1996. This resulted in the establishment of environmental information networks in 100 Chinese cities and the designation of three environmental demonstration cities, Chongqing, Guiyang and Dalian in China. Cooperation included further specialized environmental technology training. Sino-Japan cooperation was furthermore strengthened through multilateral and bilateral environmental cooperation mechanisms, for instance, through APEC, ASEAN 10+3, Tripartite Environment Minister Meetings and other multilateral and regional cooperation mechanisms.

Among all the bilateral environmental cooperation between China and other countries, the one between China and Japan has established good mechanisms and has achieved remarkable effects. It had positive impacts on enhancing friendship and understanding between the two countries, improving the situations of the environment and promoting the development of the environmental protection industry in both countries. Since 2000, Japan has started to cut down ODA drastically, which has affected the financial investment on environment protection.

15.5 China Strengthened Regional and Trans-regional Environment Cooperation.

Globalization and regionalization are the two development trends of the contemporary world. The challenges faced to achieve sustainable development and environmental protection has demonstrated the urgent need to strengthen regional environment cooperation. The latter requires that all countries in the region surpass cultural, ideological and other differences for developing and promoting regional environmental cooperation.

The report of the 16th National Congress of the Chinese Communist Party in 2002 clearly put forward the guiding principal of “being friendly to neighbors and becoming a companion of neighbors” and propose two directions for promoting “neighbor diplomacy”. The first direction was to strengthen friendly relations between neighboring countries and the second direction was to strengthen regional cooperation. It was the first time in Chinese diplomatic history that regional cooperation stands on equal foot with bilateral cooperation, and became one of the principal directions of the

2. Officers from China and Japan believe that the bilateral environment cooperation has great potential. People’s Daily, October 9th of 2002.

3. The State Environmental Protection Administration: Collection of Documents on Bilateral Environment Cooperation, 2006, pp 122-123

“neighboring diplomacy” of China. This provided a new driving force for China to develop regional environmental cooperation.

China maintained a resolute attitude in pursuing the guiding principal of “being friendly to neighbors and becoming a companion of neighbors” in regional environmental cooperation. China made efforts to establish a good regional cooperation mechanism, based on good bilateral relations based on full participation, reciprocity and common profits, being open and magnanimous active and showing initiative. The mechanism aims at allowing all partner countries to show their talents, to establish a new regional cooperation pattern of mutual promotion and general development. In addition, China also devoted itself to integrating sustainable development with regional social-economic systems, as a cooperative framework which focuses on Southeast Asia, Northeast Asia and East Asia.

China had played an important role in all the aforementioned regional environmental cooperation. China worked hard to strengthen and promote cooperation with neighboring countries or related regions, and actively participated in establishing regional cooperative mechanism. The Tripartite Environment Ministers Meeting mechanism was set up for regular exchange of policy and discussion on environmental problems of common concern. The GMS environmental cooperation mechanism, discussed below, was started. Environmental cooperation within the ASEAN and China (10+1) and the ASEAN, China, Japan and South Korea (10+3) mechanisms was implemented (Table 15.1 & 15.2).

Table 15.1 Environment cooperation between China, East Asia and Southeast Asia

Title	Starting Year	Key Members	Scope of Cooperation	Level of Cooperation	Meeting Mechanism of Leaders
Tripartite Environment Ministers Meeting	1999	China, Japan, South Korea	Environment dialogue, project cooperation	Ministerial level	Meeting of Leaders from China, Japan and South Korea
Environment Cooperation between China and ASEAN	2002	China and ASEAN 10 countries	Environment dialogue, project cooperation	High-ranking officer/working level	Meeting of Leaders from ASEAN, China, Japan and South Korea
ASEAN 10+3 Environment Ministers Meeting	2002	ASEAN countries, China, Japan, South Korea	Environment dialogue\ project cooperation	Ministerial level	Meeting of Leaders from ASEAN, China, Japan and South Korea
GMS Environment Ministers Meeting	2005	China, Burma, Laos, Thailand, Cambodia Vietnam, ADB	Environmental dialogue\ project cooperation	Ministerial level	Leaders' Meeting on GMS cooperation

Table 15.2 Environment cooperation between China, Northeast Asia and East Asia

Title	Starting Year	Key Members	Scope of Cooperation	Level of Cooperation	Meeting Mechanism of Leaders
Northeast Asian Conference on Environmental Cooperation	1992	China, Japan, South Korea, Russia and Mongolia	Environment management and communication	High-ranking officer level	Meeting of Leaders from China, Japan and South Korea
Northeast Asian Sub-regional Programme of Environmental Cooperation	1993	China, Japan, South Korea, DPRK, Mongolia and Russia	Environment project cooperation and training	High-ranking officer level	Meeting of Leaders from ASEAN, China, Japan and South Korea
Action Plan for the Protection, Management and Development of the Marine and Coastal Environment of the Northwest Pacific Region	1994	China, Japan, South Korea and Russia	Marine and coastal environment protection	High-ranking officer level	Meeting of Leaders from ASEAN, China, Japan and South Korea
Acid Deposition Monitoring Network in East Asia	1998	Cambodia China, Indonesia, Japan, Laos, Burma, Malaysia, Mongolia, Philippine, South Korea, Russia, Thailand and Vietnam,	Acid Deposition Monitoring and data sharing	High-ranking officer level	Leaders' Meeting on the economic cooperation in GMS region

15.6 China and the GMS Environmental Cooperation

Compared to active bilateral environmental cooperation and global initiatives, regional environmental cooperation is a relatively new area for China. However, the Chinese Government considers this an important area to expand environmental cooperation. Especially border provinces such as Yunnan and Guangxi participate with enthusiasm. The active participation of China in GMS environmental cooperation is a remarkable example.

Three Environmental Cooperation Mechanisms in GMS

The Great Mekong Sub-region is most important in East Asia's environmental cooperation. Three important mechanisms for GMS cooperation existed: the Mekong River Commission (MRC), the ASEAN-Mekong Basin Development and Cooperation (AMBDC) and the ADB initiated GMS cooperation (GMSC). All three mechanisms paid close attention to environmental aspects but had their own unique focus. For instance, MRC and AMBDC focused more on water resources, while the ADB fostered GMS cooperation paid comprehensive attention to environmental problems. It had a better environmental cooperation mechanism in comparison with MRC and AMBDC. China is the founder country of the ADB fostered GMS mechanism and has ongoing dialogues with MRC and AMBDC.

The Establishment of GMS Environment Mechanism within GMSC

The GMSC started in 1992. In 1995, the initiative selected the environment as one of the principal areas for cooperation and it set up the environmental working group in the same year. On the basis of working group meetings, an Environment Ministerial Meeting was set up. The first session of the GMS Environment Ministers Meeting was held in May of 2000 in Shanghai. It became the first ministerial level dialogue mechanism among all nine cooperation countries of the GMS.

At present the working group has already submitted the Biodiversity Conservation Corridors Initiative, the Environment Performance Assessment and Sustainable Development (SEF III), the Capacity Building for Regional Environmental Management and other plans that relate to environment protection in the GMS. The environment core project (first phase 2005-2008) consisted of a project management plan, development initiatives and sustainable financial support that already were approved in the first session of the GMS environmental ministers meeting and the GMS summit meeting held in August of 2005 in Kunming, the capital city of Yunnan province. This summit meeting paid much attention to environmental cooperation. The "Kunming Declaration" coming out of this meeting stated that: "We welcome the Biodiversity Conservation Corridors Initiative and suggestions on core projects approved in the sub-regional Environment Ministers Meeting".

The GMS environment cooperation established a good mechanism at present, and the GMS Environment Operation Center was set up in Bangkok to improve the capacity for project management and coordination.

China's Role in GMSC

China has attached importance to developing environmental communication and cooperation with the five other member countries since the country joined the GMSC in 1992. To improve environmental management and technical cooperation within the region, and to promote sustainable development in the sub-region and neighboring countries, China took part in the environmental supervision and monitoring of the Channel Improvement Project in the Upper Mekong River, in Environmental Training and Institutional Capacity Building in the GMS, in the Sub-regional Environment Monitoring and Information System (SEMIS) I & II, in the Poverty Alleviation and Environmental Management in the remote GMS, in the Strategic Environment Framework in the GMS and in other environment cooperation projects.

China put forward and promoted the Biodiversity Conservation Corridors Initiative to find better solutions to the sub-regional eco-environment problems and to strengthen biodiversity conservation in the GMS. China officially put forward the proposal of establishing the Biodiversity Conservation Corridor Initiative (BCI) in the GMS in the working group meeting of the GMS summit held in Beijing in July 2004. In May 2005, the first GMS Environment Ministers Meeting was held in Shanghai. In the Joint Declaration from this meeting, all participant countries agreed to submit the BCI proposal to the second GMS summit for discussion. On July 5th 2005, the summit meeting approved the project.

The Biodiversity Conservation Corridors Initiative has since then been making significant progress. After a series of regional conferences on BCI, a Three Year Action Plan as well as a Ten Year Strategic Framework were finalized. In the first phase (2005-2008), the project selected nine key areas among six Mekong region countries, in line with the importance and fragility of species and then established the conservation corridors to recover and maintain contact between national parks and wildlife reserves in pilot zones in the selected areas. Since March of 2005 the project already set up an experts working group, and conducted field studies, to collect information and appraisal for the final project implementation, in the nine pilot zones.

After the assessment of the pilot projects, all parties will draw up plans for the second phase (2009-2011), to establish more corridors in the key areas. The key point of the third phase (2012-2014) is to stabilize the benefits from sustainable natural resource utilization and environmental protection.

The cooperation project (BCI) proposed by China had positive impact on China's participation in the sub-regional environment protection, the importance were as following:

- The project showed the sincerity of China in participating in sub-regional cooperation, and the confidence it has in sub-regional environmental protection;
- The project was set up based on the practical situation in the sub-region. The implementation process and the final results can be controlled effectively, thus this project can effectively strengthen biodiversity conservation in the region, through cooperation among the participant countries in concrete environmental projects;
- The project will make feasible contributions to regional environmental protection and social-economic development, and prove that China is a responsible partner in sub-regional environmental affairs.

China intends to continue and increase its efforts in the GMS regional cooperation. The effort of China will be manifested in the tentative plan of environmental protection cooperation between China and other countries in the GMS in the "Report on the Participation of China in Great Mekong Sub-regional Cooperation" (2005) prepared by the Chinese Government. China will enhance ecological considerate construction and environmental protection, promote cooperation on environmental protection among all countries in GMS and follow the road of sustainable development. China will improve natural forest protection in the upper Lancang-Mekong River and control soil erosion to improve water quality in the Lancang River. Further activities will include water resource conservation, clean production promotion and strictly control of sewage discharge from the cities along the upper Mekong River. China will further cooperate with all countries in the GMS to promote the environmental cooperation under the GMS framework, to enhance human resource development and training, and to mobilize international funds and technologies.

China will keep on strengthening cooperation with all countries in the GMS to promote the practical implementation of the Biodiversity Conservation Corridors Initiative, to carry out joint scientific research and assessment on biodiversity; to provide technical support, write the report on distribution of local animals and plants and find out the objectives of sustainable resource utilization.

China will be active in promoting the merging of environmental management and regionalization to protect regional eco-systems. China hopes to improve environmental management through the promotion of discussions at national level within the GMS, and it will be more active in encouraging environmental management practices among different countries through broad and open dialogue.

China will be more active in paying attention to trans-border environmental problems to achieve regional ecological security. The Chinese Government will promote mutual understanding, mutual trust and reciprocity through continuous dialogue and communication. The country will follow the principle of "making the neighbor feel friendly, secure and rich". China will make use of capable persons and technology, follow high standards, and capitalize on regional advantages to participate in environmental cooperation to actively promote sustainable development in the GMS.⁴

The tentative plan of "Participation of China in Environmental Cooperation in the GMS" brought forward by the Chinese Government is very comprehensive. However, the task is arduous and the road ahead for environmental protection and environment cooperation in the GMS is long. Thus China has to make more efforts for achieving all the grand goals of environment cooperation in the GMS, and China has to strengthen cooperation with countries within and out of the GMS.

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European Forest Certification Systems

Markus Schaller and Matthias Boesch

Abstract: In recent years, environmental problems and the concept of sustainability have become key issues in the forest sector. One consequence was the emergence of forest certification as one example of a non-state, market-driven governance structure for addressing environmental problems. While certification originally was introduced to stop deforestation in the tropics, by far the most of today's certified forests can be found in the industrialised countries of the Northern Hemisphere. In this paper, we examine some factors that explain the existing interregional divergence when it comes to forest certification. Moreover, we analyse the historical development and the present situation of forest certification in Europe, where the Programme for the Endorsement of Forest Certification Schemes (PEFC) and the Forest Stewardship Council (FSC) are by far the most important competitors. Both frameworks are non-governmental organisations and they both aim to operate at a global level striving to achieve the same ultimate objective: Sustainable forest management. As one of Europe's most important marketplaces for timber products, the case of Germany is especially considered.

16.1 Introduction

During the last few decades, public concern for the environment has grown remarkably, especially in developed countries. As a consequence, environmental issues have become increasingly more important for policy makers around the world.

Traditionally, there are two basic instruments that are applicable for governments to protect the environment and to foster sustainable development: command-and-control regulations which have historically enjoyed widespread acceptance, and market-based incentives which promote flexibility in achieving environmental goals (Van Kooten et al. 2005). In the last few years, unconvincing success of these classic approaches has increasingly led to the emergence of non-state, market-driven governance structures for tackling environmental problems. Of such governance structures, forest certification is possibly one of the more popular examples. This innovative idea was born after the failure to sign a global convention on forestry at the United Nations Conference on Environment and Development (also known as the "Earth Summit") held in Rio de Janeiro in 1992.

Forest certification is aimed at issuing a credible guarantee that wood and timber products come from responsibly managed forests, taking economic, social and environmental aspects equally into consideration (CEPI 2006). Basically, forest certification is a process which involves assessing the quality of forestry practices against a set of predetermined principles and criteria and that eventually results in a written certificate being issued by an independent third party (Perera and Vlosky 2006). Through the mechanism of forest certification, the problem of market failure stemming from asymmetric information of consumers and producers, as far as the environmental impact of wood production is concerned, can be solved.

In the literature, different economic aspects of forest certification have been examined by various authors. For instance, empirical research has identified factors that determine why forest companies voluntarily agree to let their products be certified without the threat of state involvement.¹ However, we want to examine some conditions that encourage the rise of certification activities in the forest sector of a country.

This paper is organised as follows: Section 2 presents figures about forest certification and asks the question why the share of certified forestland in some areas and countries is higher than in others. Section 3 takes a closer look at the history and structure of the two most important competitors in the European forest certification field of today and compares them to each other. Section 4 briefly describes the situation in Germany as one of Europe's most important marketplaces for timber products and provides reasons why one forest certification system prevails over the other. Our conclusions follow in Section 5.

1. In addition to economic factors that affect profits directly or indirectly (through consumers), Van Kooten et al. (2005) mention here perceived pressure from shareholders, the environmental lobby and neighbourhood/community groups, firm size, financial health, past environmental performance and regulatory threats as most important parameters.

16.2 Explaining regional differences in the number of certified forests

On a global scale, roughly 295 million hectares or about 7% of the total forest area in the world is certified (Forestry Certification Info 2007).

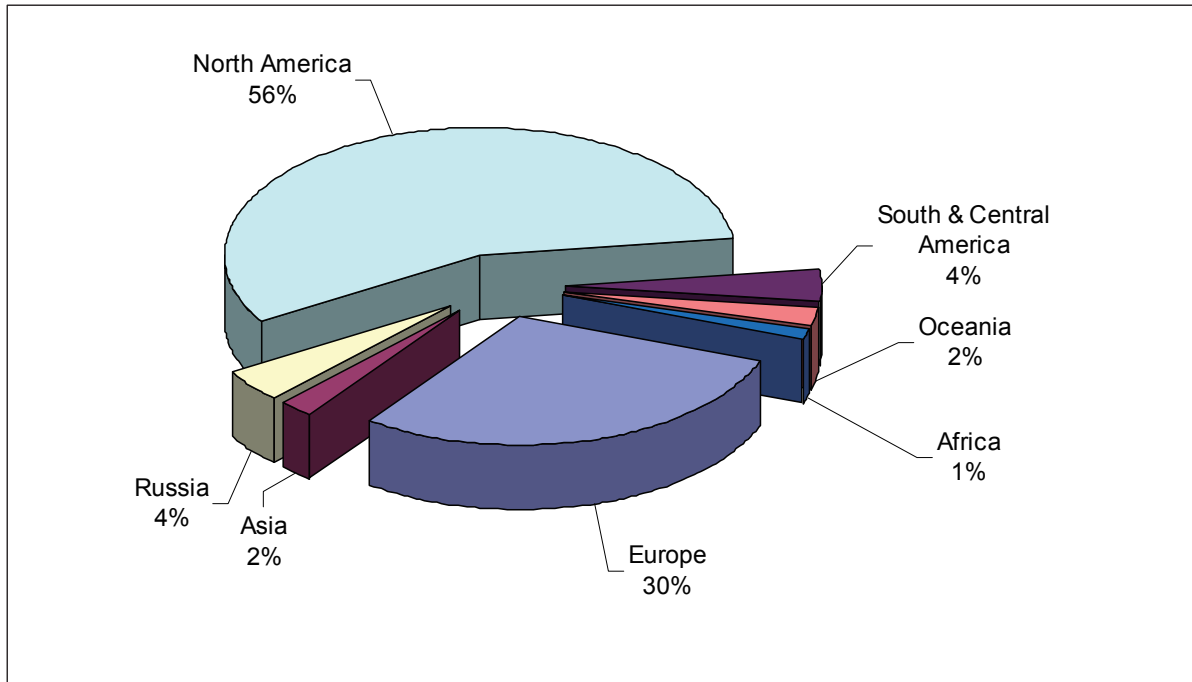


Figure 16.1 Percentage of certified forest area by region in December 2006
Source Forestry Certification Info 2007

While certification initially was introduced to stop deforestation in the tropics, by far the majority of today’s certified forests can be found in the industrialised countries of the Northern Hemisphere, namely 166 million ha in North America and 87 million ha in Europe (Figure 16.1). In this chapter, we want to examine some reasons for the existing interregional divergence when it comes to forest certification.

Maslow’s Hierarchy of Needs

One possible explanation for this divergence could be gained from looking at forests from a needs-satisfaction point of view, following Abraham Maslow’s famous hierarchy of needs. Human beings have fundamental needs that eventually result in physical or psychological suffering if they are left unsatisfied. Needs may be delineated as requirements for a person’s survival, health or basic liberties (Juslin and Hansen 2002). In his seminal analysis, Maslow (1970) describes five needs in a hierarchy of “prepotency”. The hierarchy exists since “higher” needs emerge after “lower” needs are met and this progressive fulfilment becomes the motivating force behind a person’s behaviour. One important aspect of this hierarchy is that once a need is fulfilled, it does not act as a motivating

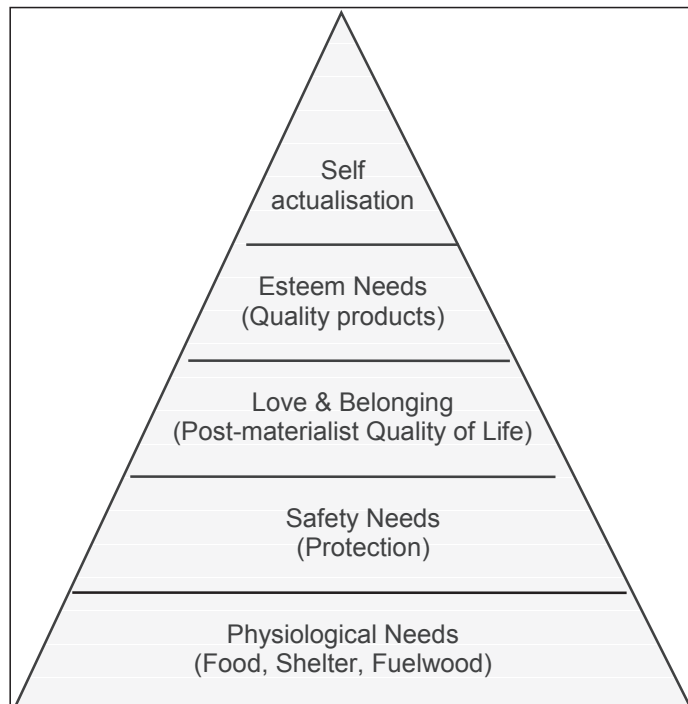


Figure 16.2 Maslow’s hierarchy of needs and the offerings of forests
Source Juslin and Hansen 2002

force any more. In fact, it ceases to exist and re-emerges only if its provision is stopped.

Countries and societies around the world vary in their intensity and method of forest utilisation. In developing countries, forest products are predominantly used for fuelwood or shelter and the forest industry is relatively unimportant. On the other hand, in industrialised countries, forest industry may be highly developed. Yet, people of these nations have become less reliant on tangible products from forests and now often consider them to be resources for recreation and conservation. Hence, forest usage changes as a society develops. Maslow's hierarchy can be a useful tool to describe these changes.

Juslin and Hansen (2002) present an example of the relationship between Maslow's hierarchy of needs and the services of forests, which is illustrated in Figure 16.2. Physiological needs, the lowest level in the hierarchy, are mainly satisfied through non-wood forest products that provide food or shelter. Fuelwood also belongs to this category, 90% of which is used in developing countries (Juslin and Hansen 2002). The next level consists of safety needs that are met by forests' protective functions. The conservation of biodiversity belongs here, which is also important for the recreational use of forests and thus overlaps with the level of love and belonging needs. Esteem needs can be satisfied through high quality products, while the need for self-actualisation is met by forests providing peace, tranquillity and contemplation.

A shortcoming of this approach is that for different societies, or even for different individuals, a service may stand for different levels of need satisfaction. For instance, one person may buy a certified wood product to protect the environment (safety need), whereas another may buy it just to show others how conscientious he is (esteem need). However, it should be obvious that in a country where not even basic physiological needs are fully met, forest certification cannot be an important matter and therefore, the area of certified forests is rather small.

Van Kooten's Model of Explaining Forest Certification

Van Kooten et al. (2005) use a more analytical manner to find some conditions that foster the growth of a forest certification sector in a country. In what follows, we want to summarise the most important results of their study. The authors use a regression which takes on a logistics functional form that can be estimated using OLS as follows:

$$\ln\left(\frac{y_i}{1-y_i}\right) = \alpha_0 + \alpha_1 x_{1i} + \dots + \alpha_n x_{ni} + \varepsilon_i$$

The dependent variable y_i is expressed as a log-odds and is measuring the share of total forestland which is covered by a certification scheme in country i , α_k ($k = 1, \dots, n$) are parameters to be estimated and $\varepsilon_i \sim (N(0, \sigma))$ are normally distributed error terms. Data was available for 106 countries that have an area of more than 100,000 ha covered with forests and/or forest exports that accounted for 1% or more of total exports. The regression results are provided in Table 16.1.

The environment in industrialised countries usually has greater opportunity costs than in developing countries, since demand for environmental products and services increases as income rises. Under such circumstances people are willing to pay more to protect the environment, for instance to protect watersheds or to conserve wildlife habitat. Therefore, the probability of a country's forests getting certified can be expected to increase as income rises (if the forest industry reacts to changes in domestic preferences). However, purchasing power weighted per capita GDP does not have a significant impact on the quantity of certified forestland.

A country where forest companies and landowners export a high proportion of their wood products is more likely to have a considerable area of certified forests. One could argue that internationally operating forest companies may be particularly worried about incidents on foreign markets, for example lawsuits or threats of product boycotts, and therefore voluntarily decide to sell certified products.

	Forest Certification
Intercept	-19.14** (-5.07)
GDP per capita	0.0001 (0.85)
Proportion of forest products exported	16.728** (3.03)
Proportion of population living in rural areas	6.832** (2.05)
Size of government	-0.455 (-1.32)
Structure of economy and use of markets	0.867** (3.17)
Overall literacy	0.077** (2.47)
Number of observations	106
R ²	0.5198
F-statistic	31.66**

Table 16.1 Certified proportion of total forest area: OLS regression results^a

^a = White's (1978) corrected standard error t-statistics provided in parentheses; * = statistical significant at the 0.10 or better level; ** = statistical significant at the 0.05 or better level for a two-tail t-test. Source Van Kooten et al. (2005)

The authors also include the proportion of the total population that lives in rural areas as an explanatory variable in their model. The positive and statistically significant coefficient might seem surprising at first, since in many less developed countries with a high percentage of rural population, forests are often converted to agricultural areas that yield higher profits. If this is the case, forest landowners are less willing to adopt forest certification principles because woodlands are harvested once and then transformed. On the other hand, there are few property rights for many rural people in the world. Forest certification can provide a guarantee that the benefits these farmers get from their forests will continue to exist in the future. Thus, they will put pressure on their governments to introduce forest certification. Here, the latter factor seems to be the crucial one.

Finally, it is conjecturable that forest companies are more willing to seek certification in a country where political, economic and social institutions are more advanced. To model these impacts, Van Kooten et al. use two indexes, namely the "size of government" and the "structure of the economy and use of markets", both ranging from 0 to 10, and the overall literacy rate to measure the extent to which a country's citizens are empowered. While the "size of government" variable does not provide a statistically significant explanation, the "structure of the economy" index and the literacy rate show the expected positive sign and are statistically significant.

16.3 European Forest Certification Systems

During the last decade, two global forest certification frameworks, which are also predominant in Europe, have evolved: the Forest Stewardship Council (FSC) and the Programme for Endorsement of Forest Certification (PEFC). The latter especially has gained rapid momentum in the last few years (see Figure 16.3). In December 2006, FSC and PEFC together accounted for almost 278 million hectares or about 94% of total certified forestland in the world. Only a tiny area of the world's existing certified forests (about 17 million hectares) is not attributable to either of the two leading systems (Forestry Certification Info 2007).

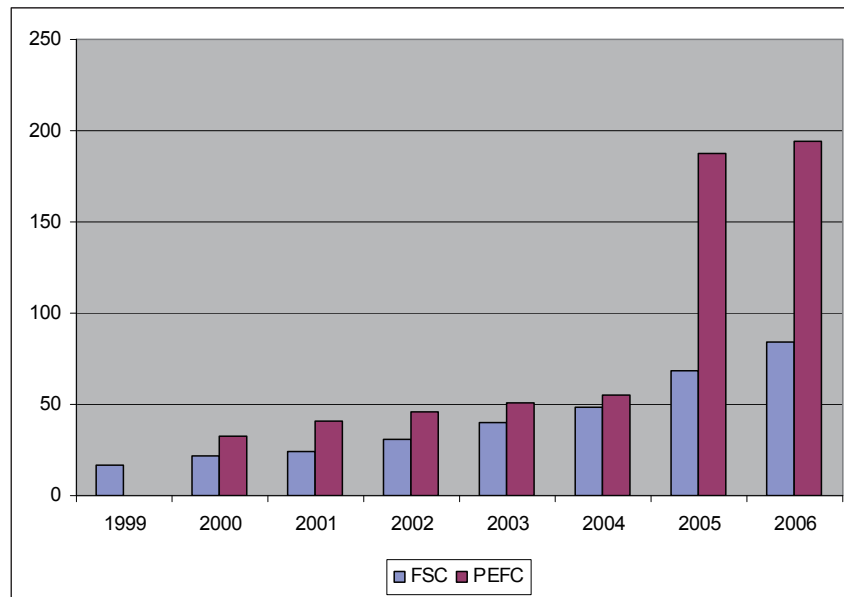


Figure 16.3 Development of certified forest area worldwide (million hectares).
Sources FSC 2007; PEFC 2007

Forest Stewardship Council (FSC)

The Forest Stewardship Council (FSC) is an international non-profit organisation which established and operated the first system for sustainable forest management. The official mission of FSC is “to promote environmentally appropriate, socially beneficial and economically viable management of the world’s forests” (FSC 2007).

The history of FSC started in 1990, when a group of timber users, traders and representatives of environmental and human-rights organisations gathered in California to talk about the installation of a reliable system to identify well-managed forests as acceptable sources of forest products. The requirement of an independent global organisation that would facilitate the process of certification was emphasised. In March of 1992, the interim board of directors was established and in October of 1993 130 participants from 26 countries worldwide met in Toronto, where the founding assembly took place. The secretariat office, originally opened in Oaxaca, Mexico, was re-located to Bonn, Germany in January of 2003 (FSC 2007).

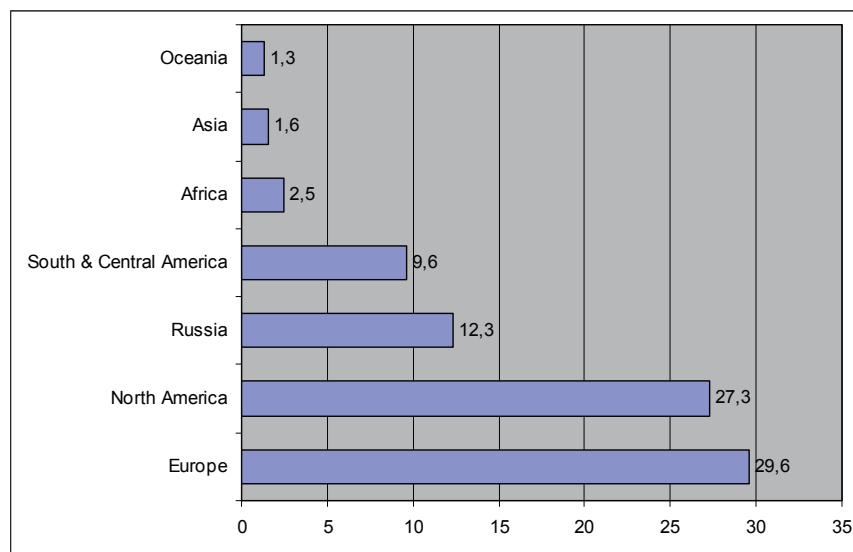


Figure 16.4 Area of FSC-certified forests by region in December 2006 (million hectares).
Source Forestry Certification Info 2007

A timber company or another organisation which wants to get certified to FSC standards and to bear their logo must get in touch with an accredited third party certification body. FSC itself does not certify forest operations or manufacturers but certifies the auditors that do. Timber stemming from well-managed forests is entitled to carry the FSC logo. Products are also tracked through the supply chain from the forest to the consumer. This guarantees that commodities with the FSC emblem are coming from certified forests (Frambach 2002).

In the middle of 1998, the threshold of 10 million hectares of FSC-certified forests around the world was reached. Presently, about 84 million hectares in more than 70 countries worldwide are certified to FSC standards (Forestry Certification Info 2007; FSC 2007). As Figure 16.4 shows, the majority of certification activities take place in Europe and North America.

Programme for Endorsement of Forest Certification Schemes (PEFC)

The Programme for Endorsement of Forest Certification Schemes (PEFC) acts as an international umbrella organisation. Its aim is to facilitate the assessment and mutual recognition among the different national certification systems, which are essentially based on the criteria and indicators developed by the Ministerial Conference on the Protection of Forests in Europe. It was mainly landowners who developed the PEFC, because these groups felt that their needs and opinions were not adequately incorporated into the environmental-organisation-led FSC (Van Kooten et al. 2005).

The PEFC was launched by representatives of eleven European countries² in 1999 as the Pan-European Forest Certification scheme. Just one year later, the Finnish Forest Certification Scheme, the Living Standards and Norwegian Forest Certification Scheme, the Swedish PEFC certification schemes as well as the forest schemes of Germany and Austria were endorsed. After Canada and the United States joined the organisation in July 2001 as the first two non-European countries, the name was officially changed. In April 2007, PEFC opened its China Office in Beijing (PEFC 2007).

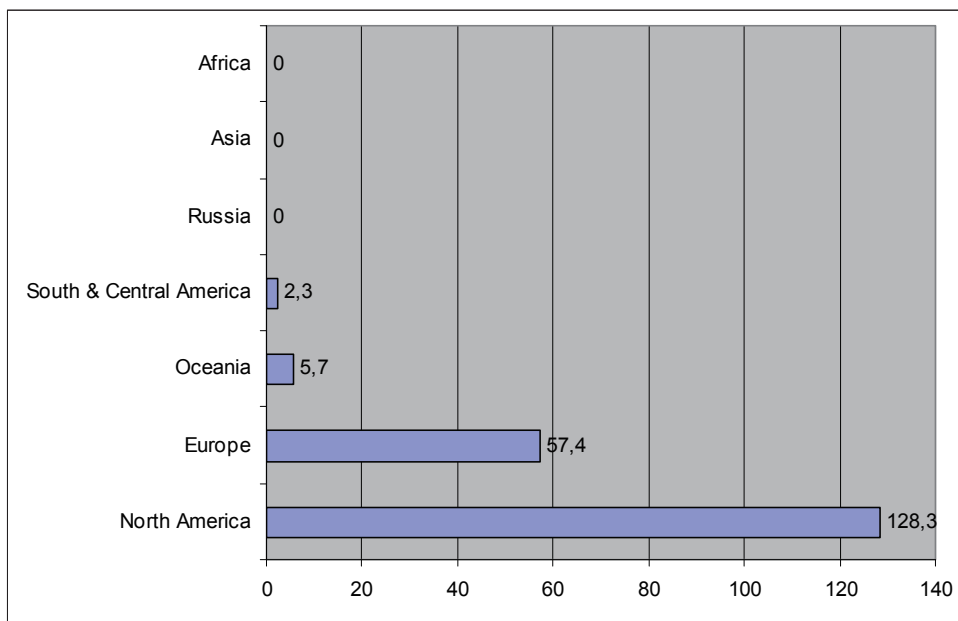


Figure 16.5 Area of PEFC-certified forests by region in December 2006 (million hectares).
Source Forestry Certification Info 2007

Today, PEFC has the largest area of certified forests in the world, with about 194 million hectares in 20 countries certified (Forestry Certification Info 2007; PEFC 2007). As is the case with the FSC, certification to PEFC standards mainly occurs to the Northern hemisphere (Figure 16.5).

2. Founder members were: Austria, Belgium, Czech Republic, France, Finland, Ireland, Norway, Portugal, Spain, Sweden and Switzerland.

Comparison of FSC and PEFC

Both the FSC and the PEFC are independent, non-profit and non-governmental organisations, which operate at a global level and aim for the same objectives: sustainable forest management. The concept of sustainable forest management that the two systems promote is largely the same. Both emphasise that forestry should conserve the economic, environmental and social forest functions, and that a participatory, consensus-building approach should be used to reach an adequate balance between these functions. To reach their objectives, both schemes use the same mechanism: independent third party assessment of forestry practices against a predetermined set of standards (CEPI 2007).

A key difference lies in the structure and operation of the two certification schemes. While the PEFC endorses fully autonomous certification schemes operating at national level, the FSC follows a more centralised approach and acts as a global framework to accredit certification bodies.

The main differences between the forestry principles of the FSC and PEFC can be found in the level of detail provided on different aspects of forest management. For instance, the PEFC is more specific than the FSC in its standards for forest protection against pests and fire, whereas the FSC has higher requirements concerning public consultation during forestry operations (CEPI 2007).

16.4 The Case of Germany

The roots of forest certification in Germany go back to the late 1980s, when slogans like “save our last rainforests” by German environmental groups led to public awareness and to boycotts of tropical wood. In 1991, the German association of tropical timber importers demanded a certificate of origin. It should ensure that all tropical timber imported to Germany would be produced in a sustainable manner (Teegelbekkers 2003).

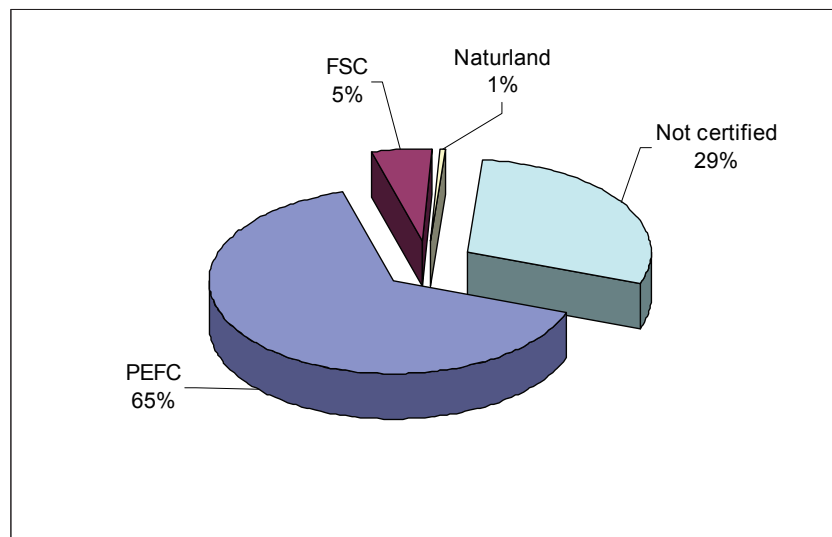


Figure 16.6 Current certified forest area by scheme in Germany

Sources FSC 2007; PEFC 2007; Naturland 2007

In the mid 1990s, when pressure for certification had broadened on temperate and boreal forests, certification started to directly impact the domestic forest industry. German environmental groups created or supported programs like Naturland and eco-timber that, in turn, were refused by private landowners and the German Forestry Council (consisting of state forestry agencies, forest products associations, private landowner associations and academics; Klins 2000). In their opinion, the labels were inappropriate for the German case, where today about 2 million forest owners are managing 11.08 million hectares of forest and almost half of the forests (43%) are privately owned (Mrosek et al. 2005).

In 1997, when the German FSC working group was established, the forest sector responded by working together with forest landowners all over Europe to create its own label, the PEFC. Germany even acted as a coordinator of the PEFC initiative that was originally led by Finland and France. The actual starting point for the PEFC in Germany was a demonstration of forest owners in Hamburg in 1997, where several companies of the pulp and paper industry were

accused of forcing forest owners into the FSC certification scheme (Teegelbeekers 2003). Subsequently, the PEFC gained broad support from nearly all private and state landowners, while the FSC was essentially endorsed by all major environmental NGOs and forestry labour unions (Cashore et al. 2003). Today, the PEFC is by far the most important competitor in Germany's forest certification field, with 7.19 million hectares or about 65% of the total forestland certified to its standards, whereas the FSC plays only a marginal role (Figure 16.6; PEFC 2007).

A main reason for landowners' refusal of the FSC lies in the fragmentation of the forest in Germany, where a private forest enterprise has an average size of only 2.5 hectares (Mrosek et al. 2005). On this level, individual certification comes with two disadvantages: firstly, indicators of sustainability can hardly be measured on such a small unit, and secondly, the certification fees are disproportionately high. Therefore, forest landowners integrated the possibility of regional and group certification into the PEFC.

Another main reason for demanding an alternative certification system was the three-chamber system of the FSC, in which the majority of the forest landowners felt that their opinions and interests were not adequately represented.³ In addition, some of the original certification criteria of the FSC were simply not acceptable for the forest landowners, for instance a complete ban on harvesters, or leaving 10% of the forest area totally unmanaged. As a result, in the German Forest Certification Council (the decision making body of PEFC) private, communal and state forest owners cannot be outvoted (Teegelbeekers 2003).

Germany has a long tradition of sustainable forestry, with its roots dating back to 1713, when tax accountant and mining administrator Hans Carl von Carlowitz published his book *Sylvicultura oeconomica* – the first comprehensive treatise about forestry, wherein he came up with the concept of sustainability (Grober 1999). Moreover, the German forestry legislation is widely considered to be one of the most comprehensive in the world. Hence, the support for the PEFC was less because forest landowners deemed a certification scheme to be absolutely necessary, but more because they feared losing their market access and came to believe that in the absence of a competitor program, the market might force them to adopt the unacceptable FSC. Thus, the PEFC is almost seen as the lesser of two evils (Cashore et al. 2003).

Compared to most other countries in the world, German forest certification has really made headway in recent years, with today less than one third of total forestland uncertified. Based on the experiences of the forestry sector, attempts have recently been made to widen the concept of sustainability certification into agriculture.

16.5 Conclusions

In recent years, environmental problems and the concept of sustainability have emerged as key issues in the forest sector. Forest certification offers a means to meet public expectations. Today, the FSC and the PEFC are by far the most important competitors in the forest certification field aiming at the same ultimate objective: sustainable forest management. The two schemes together account for about 94% of total certified forestland, mainly located in the Northern Hemisphere.

During the last decade, several other schemes have evolved in addition to the two major players. The proliferation of certification systems has some potential disadvantages. Most importantly, with an increasing number of labels in the market, it will likely lead to confusion in consumers' minds. Mutual recognition between different certification schemes could be a way to avoid this confusion. However, the example of Germany, where recent efforts aiming at mutual recognition between the FSC and PEFC were aborted, shows that it is far from being easily done. Moreover, in the context of transborder environmental management, harmonisation of forest criteria between different countries is an important issue, since many forest owners in wood-exporting countries with stricter certification standards feel disadvantaged in relation to others (personal interviews).

Thus, despite its promising role as a non-state, market-driven governance structure, some issues still need to be addressed if forest certification is to gain real momentum in the future. It is still difficult to forecast which role it will finally play. On a global scale, the volumes of certified timber traded will surely increase, as more and more countries pass their national certification standards and the worldwide demand for timber is rising. However, the deciding factor will be consumers' perception and willingness to pay – which is currently far from clear.

3. The three FSC chambers are the Social, the Environmental and the Economic Chamber.

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Resources-Oriented Principle and its Application in China¹

Luo-Ping Zhang, Wei-Qi Chen, Qin-Hua Fang, Pei-Er Wang and Hua-Sheng Hong

Abstract: It is widely believed that resource use conflicts are the main problems and obstacles in regional sustainable development. Most development models used by regional governments are demand-oriented approaches to determine regional socio-economic development objectives. Such approaches are short-sighted, and may cause conflicts and disputes in natural resource use. How to resolve resource use conflicts? The most recommended approach is integrated natural resource management (INRM). INRM, however, is only a conceptual framework that is difficult to effectively implement. We proposed a resource-oriented principle (ROP), and applied it in regional projects of environmental planning and management in China by using resource evaluation techniques from resource and environmental economics. The ROP calls for the optimization of resource utilization and resolves resource use conflicts, especially in transborder environmental and natural resource management. Case studies of ROP application were done. It showed that ROP is an effective way to avoid mistakes in the decision-making process, and guide regional development towards sustainability.

17.1 Introduction

Resources are assets and a country's collective wealth, and mean available stock or supply that can be drawn on. They include raw materials and environmental commodities of material and non-material types with social availability and relative scarcity. They are the basis of regional socio-economic development and a long-standing human concern. To maintain the long-term security of resources is essential for sustainable development.

It is widely believed that resource use conflicts are the main environmental problems and the obstacles for local and regional sustainable development due to population pressure and economic driving forces. Most development models of regional governments use a demand-oriented approach or market-based model to determine regional socio-economic development objectives. Such an approach is short-sighted, and may cause conflicts and disputes in natural resource use, and lead to the over-exploitation, degradation and depletion of natural resources. Therefore, a demand-oriented approach is not a sustainable development model. How to resolve resource use conflicts? Many approaches have been proposed such as integrated natural resource management (INRM) (Hooper et al. 1999; Lal et al. 2002; Saxena et al. 2002), stakeholders or community-based resource management (Dungumaro and Madulu 2003; Johnson et al. 2004; Oettle et al. 2004), ecosystem approaches (Barange 2004; Croxall and Nicol 2004), conceding property rights (Pasqual and Souto 2003), economic valuation approach (Ledoux and Turner 2002), threshold-based approach (Roe and van Eeten 2001), resource zoning (Moleele and Mainah 2003) and multidisciplinary approach (Rinaldi and Salvati 2002). The most recommended approach is INRM. But INRM is only a conceptual framework that is difficult to effectively implement. Recently the Ecosystem-Based Management approach (EBM) was proposed for environmental and natural resource management (Slocombe 1998; Symes 2007), and its application to resolve transboundary issues (Hildebrand et al. 2002; Brody et al. 2004; Danby and Slocombe, 2005). The approaches mentioned above, however, all focus on environmental and natural resource protection and management, not on the decision-making of regional development. It would not resolve basically the conflicts in natural resource use without considering regional development.

A resource-based approach has been used successfully as a powerful competitive weapon in the strategic manage-

1. The National Science Foundation Committee of China, the Fujian Science Foundation Committee, the Canadian CIDA, the Program and Development Committee of Fujian Province, Ningbo Municipality, and Xiamen Municipality funded research leading to this chapter. Dr. Liette Vasseur, Dr. Anne Marie Dalton and Dr. William C. Hart of the Community-Based Conservation Management Project contributed to the first case study.

ment of corporations and trades (James 2002; Pandza et al. 2005). We think this approach could be used in INRM to resolve resource use conflicts and transboundary issues. We proposed a Resource-Oriented Principle (ROP) in 1998, and then applied it in the regional projects of environmental planning and management in China (Liu et al. 2001). Similar studies have been done such as resource-based approach applied in water-quality assessment (Roux et al. 1999) and in freshwater inflow management (Mattson 2002), resource-based economies (Picton and Daniels 1999) and sustainability indicators (Herendeen and Wildermuth 2002), and resource-centred approach applied in irrigation (Lankford 2004). These case studies have made significant progress for resource management and utilization. Unfortunately, all of them focused on the resolutions in measurement levels or the conceptual frameworks, and did not push the resource-based approach to become a principle for resolving issues of resource use conflict and transborder issues, and for guiding regional development towards sustainability.

In this paper we established the definition and implications of ROP through experiences in ROP applications, drafted and practiced methods of ROP application, and summarized experiences and lessons from case studies.

17.2 Resource-Oriented Principle (ROP)

Definition and Implications

Resources and environmental capacity (a kind of resource) are the foundation of local and regional development. Development would not be sustainable if it did not primarily depend on regional resources or if it exceeded environmental capacity in the decision-making process of socio-economic development objectives and the determination of regional leading industry. It would cause conflicts and disputes in natural resource use, and thus lead to environmental and resource degradation, decrease regional development, and cause environmental problems. It is well documented all over the world, especially in coastal zones (Masalu 2002; Noronha 2004).

The ROP stated that the regional development objectives and leading industry should be determined by the characteristics of local main resources and environmental conditions. The ROP is a long-term view that guides development towards sustainability, and calls for the optimization and sustainability of resource utilization. The ROP means that:

- Regional development should be based on leading, characteristic and dominant resources in the region;
- Resources and environmental capacity are the foundations for determining the objectives and dimensions of regional development;
- The objectives of ROP are based on long-term, optimization and sustainability of resource utilization, i.e., the regional development should maintain the sustainable use of resources as a prerequisite.

Resource could be utilized sustainably, the conflict in resource use could be resolved, and the sustainability of regional development would be reached only by implementing ROP.

Methodologies for Using ROP

A solution to resource use conflicts for ROP application is found by using resource evaluation. Some methods and procedure include:

- Using environmental economic approaches, such as market value method, benefit-cost analysis and travel cost method, to determine natural resource valuation;
- Using public goods theory and environmental economic approaches to evaluate the environmental resources which can not be observed in the market place and have externality;
- Using environmental economic approaches, such as opportunity cost approach, to determine regional main or leading resource(s);
- Using benefit-cost analysis approaches to assess the environmental impact of human activities, resource use and alternatives;
- Combining environmental economic approaches and community-based or stakeholder participation approaches to determine the objectives and dimensions of regional development and to improve the efficiency, transparency, equity and sustainability of resource use and decision-making.

The ROP could be used effectively by using these approaches in regional planning and management. Some case studies for ROP application were done in China as follows.

17.3 Case Studies

Community-Based Conservation Management Project

The Canadian International Development Agency (CIDA) sponsored a five-year (1998-2003) international cooperation project, named Community-Based Conservation Management in China and Vietnam (CBCM). Seven universities from Canada, China and Vietnam were involved. The strategic environmental assessment (SEA) of Development Planning of the Southeast Coast (DPSC) of Xiamen Island was the Pilot Project for CBCM in Xiamen (SEA-1 1999-2000). The study area of SEA-1 was the Southeast Coast of Xiamen Island (Figure 17.1). It was a potential area for tourism development with three kilometers long sand beach and beautiful seaside view, and would be developed in 2000 after the new road around the Island was built. The DPSC was drafted in 1999, and was not submitted for review.

As a pilot project, SEA-1 focused on assessing the impacts of the DPSC, aimed at resource and ecosystem conservation, and encouraged public involvement throughout the SEA process. Resource use conflicts were found in the DPSC with the mix function of industrial, residential, tourist and commercial development. The proposed high density population and construction would probably be harmful to the tourism resource, and would decrease surrounding environmental quality. The sewage discharge from industry and high residential population would contaminate the seawater of lido and lancelet habitat, the conservation species of China (Figure 17.1).

The travel cost method was used to evaluate the tourism resource of the coastal zone (Chen et al. 2004), and other land development types were evaluated by direct market method in SEA (Liu et al. 2002). The leading resource defined by using opportunity cost approach to compare resources in this coastal area was the tourism resource. The regional development objective was determined as tourism development by ROP with opportunity cost approach and stakeholder participation approaches. SEA-1 also used the Precautionary Principle in the face of uncertainty, proposed some alternatives with stakeholder participation approaches and benefit-cost analysis, evaluated the tourist capacity, and drafted a conceptual framework for ecotourism to guide the revision of the DPSC. As a result the DPSC was revised. The development objective of this area was determined by decision-makers as tourism area. The densities of population and construction were reduced. The possibility of negative impacts on tourism resource and the environment would be mitigated. The resolution of resource use conflict was the key issue in this case.



Figure 17.1 Map of demonstration site of Xiamen Area

Strategic Environmental Assessment of General Harbor Planning of the Xiamen Seas

In order to explore the deep coastline resources of the Xiamen Seas more effectively, the Government of Fujian Province suggested formulating General Harbor Planning of the Xiamen Seas (GHPXS). To systematically and comprehensively consider the impact of development planning on the marine environment, reduce mistakes in the decision-making process, and mitigate negative impacts on the environment during harbor development, the SEA of the GHPXS (SEA-2 2000-2002) was initiated at the beginning of the GHPXS formulation, and conducted in conjunction with GHPXS. SEA-2 was not an assessment after the formation of the plan, but an internal element of the planning process and an auxiliary tool for decision-making (Chen and Zhang 2003). The planning area covered all of Xiamen Seas including TongAn Bay, Western Bay, Estuary and adjacent seas (Figure 17.1).

Because the Xiamen Seas belong to two cities, Xiamen City and Longhai City, transborder environmental and resource use conflicts were found in the assessment such as channel and anchorage use conflicts of two sites, the conflict of Xiamen harbor construction and Baijiao mangrove area of Longhai City (Figure 17.1), and the conflict between harbor construction and mariculture of Longhai City. The ROP was used to determine the regional development as harbor development by using opportunity cost approach, and mariculture should be removed partly. The channel and anchorage use conflicts could be resolved by the ROP to set up a uniform administration for two sites. The stakeholder participation approaches, ROP, precautionary principle and sustainable development principles were used for the conservation. The alternative to Baijiao mangrove was a mangrove compensation plan in the estuary using eco-restoration principles proposed by experts. This case study provides an example of the successful application of combining stakeholder participation approaches and ROP by demonstrating that all ecosystem resources should be conserved.

Marine Environmental Capacity of Xiangshan Bay, Zhejiang Province

Xiangshan Bay is a subtropical, semi-enclosed bay, and very suitable for aquaculture. With the rapid development of aquaculture and industry in and around the bay, seawater quality declined, and the frequency of red tide blooms increased year by year. The Government of Ningbo City proposed a Study on Marine Environmental Capacity and Total Pollution Control of the Xiangshan Bay (2001-2003).

Despite marine functional zoning in Xiangshan Bay, competing resource use conflicts still existed among shipping, aquaculture, tourism, power plant and coastal industry around the Bay. We reformulated the marine functional zoning of Xiangshan Bay following the ROP by evaluating the net benefits of the resources using economic approaches, and determining the main resource through opportunity cost approach. The final marine functional zoning determined that the dominant industry is aquaculture, compatible industry is tourism, and controlled industries are shipping and coastal industry to resolve resource use conflicts and optimize the distribution of environmental capacity of the Bay among the industries (Wang et al. 2004a).

Conceptual Planning of Eco-city of Xiamen City

The Environmental Protection Bureau of Xiamen City proposed to develop a Conceptual Planning of Eco-city of Xiamen City (CPEC) in 2003 to guide urban construction towards sustainability and ecosystem conservation.

To resolve resource use conflicts among industries and maintain ecosystem health and security, we investigated the natural features, socio-ecological and economic-ecological structures, resource types and quantities, environmental and ecological conditions, and identified through resource evaluation that shipping and tourism were the two dominant competing resources in Xiamen City (Wang et al. 2004b). The Xiamen government focused on the harbor development, and ignored the tourism development and resource conservation because the shipping industry would drive economic development faster than tourism in the short-term. Unfortunately, it was found that some tourism resources and environmental resources were degraded, including Chinese white dolphin habitat (Light blue area in Figure 17.1), due to rapid growth in the shipping industry. The two dominant resources of Xiamen were compared. The results showed that according to opportunity cost approach the net benefit of tourism was higher than shipping. The leading industry was determined finally as tourism by the ROP and stakeholder participation approaches including citizens, officers, tourists and scientists. The development objective of Xiamen City was proposed to be an international and regional tourism city. The issues of the conservation of tourism resources and the environment, and the conflicts between maritime and tourism development should be recognized although the cause-and-effect relationships could not be fully established scientifically.

17.4 Discussion

The case studies mentioned above showed that ROP is an effective way to avoid mistakes in the decision-making process. Its main objectives include:

- To resolve resource use conflicts including transborder resource and environmental issues by scientific support in the decision-making process;
- To ensure the optimization and sustainability of regional resource utilization;
- To protect local ecosystems and the environment;
- To push decision-making towards a more scientific and democratic level;
- To direct regional development towards sustainability. It is not a short-sighted, but a long-term view for regional development.

The ROP should be a basic and central principle for urban and regional development and management and as such has the potential for application in transborder environmental and natural resource management. It is an approach that challenges historical linkages between science and policy.

The difficulty in ROP applications is still the evaluation of environmental cost, which is a kind resource of public goods, and is not observable in the market place. How to calculate rationally the evaluation of ecosystem and environmental resource is still a problem that needs to be resolved. It is a key issue for decision-makers to receive the results of ROP application in order to maintain ecosystem and environmental health.

It was found in the case studies that public participation was an effective way to help the application of ROP. The results from either communities or stakeholders are the same or very similar with those from ROP. It demonstrates the importance of public involvement and the accuracy of both public opinion and ROP results. It makes it easier to pressure decision-makers to receive suggestions from both factors.

It is difficult to implement the ROP effectively in China because of the top-down management system. The four case studies presented here are a few successful examples of ROP application that benefited from the support of international organizations and open-minded government agencies. However, the results from the last two cases and other small cases not introduced here were not well received or well implemented by local governments. Regardless, ROP can effectively push decision-making towards sustainability, and enhance decision-maker's awareness as capacity building.

17.5 Conclusions

ROP is a principle for decision-making which resulted from practice, and is not based on "sound science". However, it is a crucial tool to overcome scientific limitations at the science-policy interface, to resolve resource use conflicts and transborder environmental and resource issues in the decision-making process, to call for the optimization and sustainability of resource utilization, and to guide regional development towards sustainability. So it is a "sounder" kind of science at the science-policy interface. It could close the gap between science and decision-making, and push decision-making towards scientific decision-making and democratization.

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CIAS Discussion Paper Series No. 4

Wil de Jong (editor)

TRANSBORDER ENVIRONMENTAL AND NATURAL RESOURCE MANAGEMENT

発行日：2008年3月

発行：京都大学地域研究統合情報センター

〒606-8501 京都市左京区吉田本町

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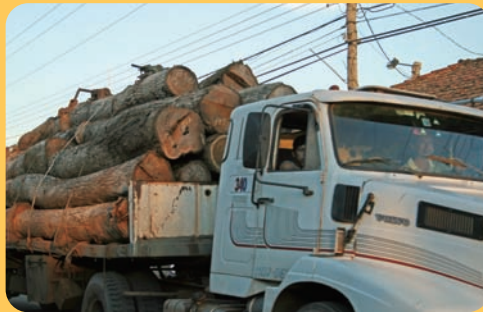
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印刷：株式会社石田大成社

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